

## WHAM output tables

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

	Estimate	Std. Error	95% CI lower	95% CI upper
NAA $\sigma$ (age 1)	0.792	0.105	0.611	1.028
NAA $\sigma$ (age 2-10+)	0.494	0.029	0.440	0.554
NAA residual AR1 $\rho$ age	0.000	—	—	—
NAA residual AR1 $\rho$ year	0.000	—	—	—
Index 1 fully selected q	0.003	0.000	0.002	0.004
Index 2 fully selected q	0.000	0.000	0.000	0.000
Index 3 fully selected q	0.000	0.000	0.000	0.000
Block 1: Mean Selectivity for age 1	0.107	0.013	0.084	0.136
Block 1: Mean Selectivity for age 2	0.376	0.042	0.297	0.461
Block 1: Mean Selectivity for age 3	0.624	0.058	0.505	0.729
Block 1: Mean Selectivity for age 4	0.705	0.058	0.580	0.805
Block 1: Mean Selectivity for age 5	0.783	0.060	0.644	0.879
Block 1: Mean Selectivity for age 6	1.000	—	—	—
Block 1: Mean Selectivity for age 7	1.000	—	—	—
Block 1: Mean Selectivity for age 8	1.000	—	—	—
Block 1: Mean Selectivity for age 9	1.000	0.000	0.000	1.000
Block 1: Mean Selectivity for age 10+	1.000	0.000	0.000	1.000
Block 2: Selectivity for age 1	1.000	—	—	—
Block 2: Selectivity for age 2	1.000	—	—	—
Block 2: Selectivity for age 3	1.000	—	—	—
Block 2: Selectivity for age 4	1.000	—	—	—
Block 2: Selectivity for age 5	1.000	—	—	—

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

	Estimate	Std. Error	95% CI lower	95% CI upper
Block 2: Selectivity for age 6	1.000	—	—	—
Block 2: Selectivity for age 7	1.000	—	—	—
Block 2: Selectivity for age 8	1.000	—	—	—
Block 2: Selectivity for age 9	1.000	—	—	—
Block 2: Selectivity for age 10+	1.000	—	—	—
Block 3: Selectivity for age 1	0.000	—	—	—
Block 3: Selectivity for age 2	0.000	—	—	—
Block 3: Selectivity for age 3	1.000	—	—	—
Block 3: Selectivity for age 4	0.450	0.184	0.160	0.779
Block 3: Selectivity for age 5	0.220	0.091	0.090	0.444
Block 3: Selectivity for age 6	0.203	0.068	0.100	0.367
Block 3: Selectivity for age 7	0.000	—	—	—
Block 3: Selectivity for age 8	0.000	—	—	—
Block 3: Selectivity for age 9	0.000	—	—	—
Block 3: Selectivity for age 10+	0.000	—	—	—
Block 4: Selectivity for age 1	0.000	—	—	—
Block 4: Selectivity for age 2	0.000	—	—	—
Block 4: Selectivity for age 3	1.000	—	—	—
Block 4: Selectivity for age 4	0.685	0.163	0.331	0.906
Block 4: Selectivity for age 5	0.518	0.122	0.292	0.737
Block 4: Selectivity for age 6	0.462	0.088	0.300	0.633
Block 4: Selectivity for age 7	0.000	—	—	—

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

	Estimate	Std. Error	95% CI lower	95% CI upper
Block 4: Selectivity for age 8	0.000	—	—	—
Block 4: Selectivity for age 9	0.000	—	—	—
Block 4: Selectivity for age 10+	0.000	—	—	—
Block 1: Selectivity RE $\sigma$	0.288	0.102	0.144	0.576
Block 1: Selectivity RE AR1 $\rho$ (year)	-0.878	0.096	-0.975	-0.500
Fleet 1 age comp, logistic-normal: $\sigma$	15.859	0.948	14.106	17.830
Index 2 age comp, logistic-normal: $\sigma$	34.180	5.108	25.502	45.811
Index 3 age comp, logistic-normal: $\sigma$	30.021	3.082	24.549	36.711

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	4611906	3132301	1570616	664382	269291	105246	37843	13607	4893	2747
1969	1658617	5193773	2154752	714375	137610	61850	40759	32160	11819	74674
1970	3669681	986007	3933785	1266250	278293	59497	34647	35932	35859	44097
1971	1898370	2450059	820668	2565361	737682	147141	34142	21210	19194	61463
1972	1203823	1059317	1426861	713892	1385681	310112	74859	16414	15551	35711
1973	1689075	1006149	726481	793766	499298	615950	123248	32667	8843	15142
1974	1933099	979739	513288	301257	406851	259977	260345	62037	13746	8379
1975	1759099	1445113	351702	242629	123010	180094	112545	95305	28266	7105
1976	300773	1162757	679165	159339	98638	51353	73029	51705	33046	21060
1977	94284	199736	435762	216027	53398	31566	15259	21693	14927	11686
1978	50070	48981	103555	217475	107229	31833	15299	7570	14612	27019
1979	137919	54818	19882	54872	135314	73833	22169	9477	5822	24566
1980	96112	145812	30612	16243	39721	97557	34364	12361	5847	15510
1981	333181	47589	101269	17686	16386	35735	56963	20405	8640	10556
1982	807693	189662	18288	55086	7398	13870	22250	38226	12394	17021
1983	1301328	498075	108557	13425	27914	3548	4462	17044	26957	25669
1984	137635	1292514	338878	56801	9030	12208	2520	2775	11996	68901
1985	408717	59655	1163238	206170	23461	4382	13047	1658	1739	56464
1986	219583	281467	60891	954337	146550	13137	2715	11894	953	26174
1987	186773	136467	124618	46446	755147	90416	9805	1913	8303	14813
1988	405484	108926	59264	51680	29830	495373	48219	6044	1791	13911
1989	358796	282407	68182	39864	31014	12656	350961	20738	3205	9791
1990	184174	364407	224479	43745	28879	22569	6491	238333	10116	4897
1991	149567	133834	339184	144082	21924	17264	12918	4488	122026	4593
1992	177692	126810	68556	208808	90966	11638	7650	7029	3138	67877
1993	152886	134068	90364	42892	130562	48665	7224	3948	5122	31834
1994	286812	60237	131002	84301	26157	80271	23977	3599	1800	12433
1995	329486	187240	25357	88648	64107	14703	43898	13060	1754	4021
1996	242027	200407	115189	11047	51059	50623	8664	25389	6767	1941
1997	217366	150841	100511	49674	6078	19941	20044	4515	11727	3405
1998	90546	161502	80568	46838	16731	3281	9412	8764	1701	4451

Table 2. Abundance at age (1000s). (*continued*)

	1	2	3	4	5	6	7	8	9	10+
1999	129359	64315	100845	40697	20006	5724	937	3331	2727	1831
2000	390517	96322	42822	45315	15046	5943	1565	263	685	705
2001	188671	363503	73056	26011	23585	6300	1522	617	170	171
2002	223745	143100	577813	41711	13046	9935	3417	159	123	66
2003	317114	154920	121723	508839	32058	6521	6666	2681	7	79
2004	462526	252068	64004	51503	235942	11951	3157	2087	2717	37
2005	223070	402521	148222	28680	18703	100305	3948	803	226	500
2006	279911	133806	348543	72380	11096	6243	34089	1023	105	56
2007	115755	246542	87892	135099	20888	2392	1760	8823	197	8
2008	220421	73759	187990	28411	33329	4301	476	341	2049	35
2009	240581	167101	37228	77172	8585	10879	875	88	56	646
2010	81764	135124	53844	7795	14539	1476	1697	106	3	75
2011	113970	25240	30561	7882	1023	1427	173	171	14	16
2012	76294	92261	8525	7602	1335	146	60	7	4	1
2013	93776	54411	38273	1705	1735	287	40	8	1	1
2014	142125	56134	27470	10512	384	143	9	3	0	0
2015	212569	73430	22451	10411	3507	255	23	6	1	0
2016	214976	108492	24798	6978	3812	1433	57	2	1	0
2017	51608	206132	47104	10599	2795	1699	362	19	1	0
2018	84964	20534	127960	22102	4187	740	367	23	3	0
2019	84405	74004	14637	49522	6634	1644	203	80	5	1
2020	86156	51555	51041	7553	16597	2320	406	30	9	1
2021	112975	60266	23558	16056	2135	3358	656	95	12	3
2022	263845	82196	28805	7114	3452	246	889	276	19	3

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.016	0.043	0.058	0.062	0.065	0.072	0.072	0.072	0.072	0.072
1969	0.010	0.041	0.081	0.097	0.115	0.179	0.179	0.179	0.179	0.179
1970	0.030	0.094	0.141	0.155	0.167	0.198	0.198	0.198	0.198	0.198

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

	1	2	3	4	5	6	7	8	9	10+
1971	0.039	0.138	0.229	0.260	0.288	0.369	0.369	0.369	0.369	0.369
1972	0.036	0.137	0.247	0.287	0.328	0.454	0.454	0.454	0.454	0.454
1973	0.089	0.272	0.406	0.444	0.479	0.564	0.564	0.564	0.564	0.564
1974	0.057	0.222	0.408	0.479	0.551	0.784	0.784	0.784	0.784	0.784
1975	0.129	0.375	0.537	0.582	0.621	0.714	0.714	0.714	0.714	0.714
1976	0.073	0.292	0.559	0.666	0.779	1.169	1.169	1.169	1.169	1.169
1977	0.071	0.198	0.276	0.296	0.313	0.355	0.355	0.355	0.355	0.355
1978	0.010	0.041	0.083	0.102	0.122	0.199	0.199	0.199	0.199	0.199
1979	0.043	0.117	0.162	0.174	0.184	0.207	0.207	0.207	0.207	0.207
1980	0.012	0.049	0.095	0.114	0.135	0.208	0.208	0.208	0.208	0.208
1981	0.044	0.121	0.167	0.179	0.189	0.213	0.213	0.213	0.213	0.213
1982	0.015	0.062	0.122	0.148	0.175	0.277	0.277	0.277	0.277	0.277
1983	0.037	0.096	0.128	0.136	0.143	0.159	0.159	0.159	0.159	0.159
1984	0.011	0.045	0.093	0.115	0.139	0.236	0.236	0.236	0.236	0.236
1985	0.038	0.108	0.153	0.165	0.176	0.201	0.201	0.201	0.201	0.201
1986	0.018	0.071	0.129	0.150	0.172	0.241	0.241	0.241	0.241	0.241
1987	0.033	0.110	0.172	0.191	0.209	0.255	0.255	0.255	0.255	0.255
1988	0.031	0.112	0.189	0.215	0.241	0.312	0.312	0.312	0.312	0.312
1989	0.032	0.115	0.193	0.220	0.245	0.316	0.316	0.316	0.316	0.316
1990	0.048	0.167	0.272	0.306	0.338	0.425	0.425	0.425	0.425	0.425
1991	0.034	0.124	0.213	0.243	0.272	0.357	0.357	0.357	0.357	0.357
1992	0.033	0.110	0.176	0.196	0.215	0.265	0.265	0.265	0.265	0.265
1993	0.028	0.104	0.183	0.211	0.239	0.322	0.322	0.322	0.322	0.322
1994	0.045	0.148	0.234	0.260	0.285	0.349	0.349	0.349	0.349	0.349
1995	0.027	0.100	0.171	0.196	0.220	0.289	0.289	0.289	0.289	0.289
1996	0.052	0.174	0.277	0.310	0.340	0.420	0.420	0.420	0.420	0.420
1997	0.057	0.208	0.356	0.407	0.457	0.600	0.600	0.600	0.600	0.600
1998	0.083	0.279	0.447	0.499	0.548	0.679	0.679	0.679	0.679	0.679
1999	0.075	0.289	0.527	0.615	0.705	0.989	0.989	0.989	0.989	0.989
2000	0.086	0.273	0.416	0.458	0.496	0.593	0.593	0.593	0.593	0.593
2001	0.072	0.274	0.498	0.580	0.665	0.928	0.928	0.928	0.928	0.928

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.062	0.213	0.349	0.393	0.435	0.549	0.549	0.549	0.549	0.549
2003	0.056	0.196	0.322	0.364	0.403	0.511	0.511	0.511	0.511	0.511
2004	0.123	0.434	0.722	0.817	0.908	1.161	1.161	1.161	1.161	1.161
2005	0.114	0.422	0.735	0.844	0.953	1.271	1.271	1.271	1.271	1.271
2006	0.171	0.579	0.931	1.042	1.146	1.424	1.424	1.424	1.424	1.424
2007	0.116	0.432	0.762	0.880	0.998	1.350	1.350	1.350	1.350	1.350
2008	0.143	0.473	0.744	0.827	0.904	1.105	1.105	1.105	1.105	1.105
2009	0.174	0.659	1.186	1.378	1.573	2.172	2.172	2.172	2.172	2.172
2010	0.373	1.055	1.486	1.601	1.701	1.937	1.937	1.937	1.937	1.937
2011	0.142	0.597	1.217	1.488	1.791	2.975	2.975	2.975	2.975	2.975
2012	0.263	0.727	1.009	1.082	1.146	1.295	1.295	1.295	1.295	1.295
2013	0.140	0.581	1.160	1.405	1.675	2.681	2.681	2.681	2.681	2.681
2014	0.171	0.466	0.641	0.687	0.725	0.816	0.816	0.816	0.816	0.816
2015	0.082	0.336	0.661	0.796	0.943	1.473	1.473	1.473	1.473	1.473
2016	0.145	0.409	0.575	0.619	0.657	0.747	0.747	0.747	0.747	0.747
2017	0.089	0.366	0.718	0.864	1.022	1.591	1.591	1.591	1.591	1.591
2018	0.144	0.437	0.646	0.705	0.757	0.887	0.887	0.887	0.887	0.887
2019	0.087	0.345	0.647	0.764	0.887	1.292	1.292	1.292	1.292	1.292
2020	0.161	0.497	0.741	0.811	0.874	1.030	1.030	1.030	1.030	1.030
2021	0.098	0.376	0.685	0.800	0.918	1.287	1.287	1.287	1.287	1.287
2022	0.025	0.078	0.116	0.126	0.136	0.160	0.160	0.160	0.160	0.160