

## 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
Mean Recruitment	363219.754	118834.057	191285.980	689692.939
NAA $\sigma$ (age 1)	1.042	0.108	0.850	1.276
NAA residual AR1 $\rho$ year	0.472	0.131	0.179	0.688
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: Selectivity for age 1	0.108	0.016	0.081	0.143
Block 1: Selectivity for age 2	0.342	0.045	0.260	0.435
Block 1: Selectivity for age 3	0.563	0.071	0.424	0.694
Block 1: Selectivity for age 4	0.608	0.077	0.452	0.745
Block 1: Selectivity for age 5	1.000	0.000	0.000	1.000
Block 1: Selectivity for age 6	1.000	—	—	—
Block 1: Selectivity for age 7	1.000	—	—	—
Block 1: Selectivity for age 8	1.000	—	—	—
Block 1: Selectivity for age 9	1.000	—	—	—
Block 1: Selectivity for age 10+	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	—	—	—
Block 2: Selectivity for age 6	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 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	0.383	0.169	0.133	0.715
Block 3: Selectivity for age 5	0.184	0.084	0.071	0.402
Block 3: Selectivity for age 6	0.255	0.091	0.118	0.466
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	0.674	0.178	0.297	0.910
Block 4: Selectivity for age 5	0.467	0.119	0.256	0.691
Block 4: Selectivity for age 6	0.501	0.099	0.317	0.685
Block 4: Selectivity for age 7	0.000	—	—	—
Block 4: Selectivity for age 8	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 9	0.000	—	—	—
Block 4: Selectivity for age 10+	0.000	—	—	—
Fleet 1 age comp, logistic-normal: $\sigma$	31.369	1.093	29.297	33.587
Index 2 age comp, logistic-normal: $\sigma$	37.995	4.891	29.522	48.899
Index 3 age comp, logistic-normal: $\sigma$	34.641	3.054	29.143	41.175

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	5155297	1814148	293719	77172	43804	38156	30158	10947	83561	749
1969	2157437	4104496	1360002	207958	54012	27712	24139	19079	6925	53338
1970	2560408	1724064	3113163	981635	148606	35359	18142	15802	12490	39451
1971	831771	2026833	1269239	2139245	665215	89155	21213	10884	9481	31162
1972	630272	648970	1425526	808921	1336528	349175	46798	11135	5713	21333
1973	714019	493700	462157	927370	516711	727583	190085	25476	6062	14724
1974	1046698	548717	331024	272225	532140	235824	332064	86754	11627	9486
1975	1080474	797212	357674	186119	148555	223615	99098	139540	36456	8872
1976	151093	803336	481605	177411	88712	49974	75225	33337	46941	15248
1977	39246	107380	420900	188906	65635	19675	11084	16684	7394	13793
1978	19253	30401	73823	258366	113334	32231	9662	5443	8193	10404
1979	70962	15467	23442	54754	190129	77863	22144	6638	3739	12777
1980	25345	56872	11839	17177	39768	127838	52353	14889	4463	11105
1981	94924	20366	43893	8793	12660	27392	88055	36061	10255	10723
1982	296632	75650	15315	31237	6189	8083	17488	56218	23023	13394
1983	2225137	235464	56180	10676	21499	3809	4974	10763	34597	22411
1984	73248	1767120	175118	39257	7367	13287	2354	3074	6652	35235
1985	126062	58713	1353227	128412	28536	4960	8946	1585	2070	28201
1986	87637	100197	43780	949685	89021	17772	3089	5572	987	18853
1987	80475	69605	74543	30610	655716	55076	10995	1911	3447	12275
1988	335648	63815	51524	51688	20946	399749	33576	6703	1165	9584
1989	579703	262840	45403	33467	32962	11372	217023	18229	3639	5836
1990	130324	451155	183390	28558	20614	16902	5831	111284	9347	4859
1991	261974	98659	288494	99903	15061	8190	6715	2317	44212	5644
1992	156153	200538	65339	166508	56080	6630	3605	2956	1020	21947
1993	48972	121896	141268	41752	104323	29574	3496	1901	1559	12111
1994	125141	38443	87396	92931	26992	57926	16421	1941	1056	7590
1995	51233	96814	26324	53297	55361	13102	28117	7971	942	4197
1996	285194	40044	68471	16931	33629	29535	6990	15000	4252	2742
1997	96721	214201	24976	35799	8542	12421	10909	2582	5541	2583
1998	42866	71280	125845	11832	16238	2649	3851	3383	801	2519

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

	1	2	3	4	5	6	7	8	9	10+
1999	97749	31097	39851	54936	4913	4355	710	1033	907	890
2000	1617417	60315	10434	7497	9195	296	262	43	62	108
2001	155832	1225239	38649	5704	3969	3676	118	105	17	68
2002	116651	121935	869617	25004	3622	2139	1981	64	56	46
2003	325713	90774	85048	546665	15392	1855	1096	1015	33	52
2004	604203	249688	60389	49455	309351	6866	828	489	453	38
2005	241171	455123	157172	32055	25362	117374	2605	314	185	186
2006	528938	177164	264690	73224	14280	7634	35329	784	95	112
2007	125893	368568	87225	93703	24251	2640	1411	6532	145	38
2008	208747	90870	202797	37089	37822	6207	676	361	1672	47
2009	88736	153307	52808	94360	16499	11359	1864	203	108	516
2010	54084	59690	67538	15564	25642	2203	1517	249	27	83
2011	132508	32410	18262	10912	2210	1178	101	70	11	5
2012	90645	84769	12186	4145	2237	186	99	9	6	1
2013	72392	59488	34547	3159	981	238	20	11	1	1
2014	77872	47844	24788	9289	777	111	27	2	1	0
2015	155960	52964	21824	7737	2686	115	16	4	0	0
2016	254863	109057	26367	7868	2614	513	22	3	1	0
2017	38339	184426	60487	11360	3221	685	134	6	1	0
2018	119045	27635	101031	25533	4549	814	173	34	1	0
2019	79214	85086	14741	40817	9753	1063	190	40	8	0
2020	89257	58092	49221	6807	18011	2890	315	56	12	2
2021	111742	64145	31526	20458	2681	4427	710	77	14	4
2022	271233	82922	38517	15482	9647	886	1463	235	26	6

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.028	0.088	0.145	0.157	0.258	0.258	0.258	0.258	0.258	0.258
1969	0.024	0.076	0.126	0.136	0.224	0.224	0.224	0.224	0.224	0.224
1970	0.034	0.106	0.175	0.189	0.311	0.311	0.311	0.311	0.311	0.311

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

	1	2	3	4	5	6	7	8	9	10+
1971	0.048	0.152	0.250	0.270	0.445	0.445	0.445	0.445	0.445	0.445
1972	0.044	0.139	0.230	0.248	0.408	0.408	0.408	0.408	0.408	0.408
1973	0.063	0.200	0.329	0.355	0.584	0.584	0.584	0.584	0.584	0.584
1974	0.072	0.228	0.376	0.406	0.667	0.667	0.667	0.667	0.667	0.667
1975	0.096	0.304	0.501	0.541	0.889	0.889	0.889	0.889	0.889	0.889
1976	0.142	0.446	0.736	0.794	1.306	1.306	1.306	1.306	1.306	1.306
1977	0.055	0.175	0.288	0.311	0.511	0.511	0.511	0.511	0.511	0.511
1978	0.019	0.060	0.099	0.107	0.175	0.175	0.175	0.175	0.175	0.175
1979	0.021	0.067	0.111	0.120	0.197	0.197	0.197	0.197	0.197	0.197
1980	0.019	0.059	0.097	0.105	0.173	0.173	0.173	0.173	0.173	0.173
1981	0.027	0.085	0.140	0.151	0.249	0.249	0.249	0.249	0.249	0.249
1982	0.031	0.098	0.161	0.174	0.285	0.285	0.285	0.285	0.285	0.285
1983	0.030	0.096	0.158	0.171	0.281	0.281	0.281	0.281	0.281	0.281
1984	0.021	0.067	0.110	0.119	0.196	0.196	0.196	0.196	0.196	0.196
1985	0.030	0.093	0.154	0.166	0.274	0.274	0.274	0.274	0.274	0.274
1986	0.030	0.096	0.158	0.170	0.280	0.280	0.280	0.280	0.280	0.280
1987	0.032	0.101	0.166	0.179	0.295	0.295	0.295	0.295	0.295	0.295
1988	0.045	0.140	0.231	0.250	0.411	0.411	0.411	0.411	0.411	0.411
1989	0.051	0.160	0.264	0.285	0.468	0.468	0.468	0.468	0.468	0.468
1990	0.078	0.247	0.407	0.440	0.723	0.723	0.723	0.723	0.723	0.723
1991	0.067	0.212	0.350	0.377	0.621	0.621	0.621	0.621	0.621	0.621
1992	0.048	0.150	0.248	0.268	0.440	0.440	0.440	0.440	0.440	0.440
1993	0.042	0.133	0.219	0.236	0.388	0.388	0.388	0.388	0.388	0.388
1994	0.057	0.179	0.295	0.318	0.523	0.523	0.523	0.523	0.523	0.523
1995	0.046	0.146	0.241	0.260	0.428	0.428	0.428	0.428	0.428	0.428
1996	0.086	0.272	0.448	0.484	0.796	0.796	0.796	0.796	0.796	0.796
1997	0.105	0.332	0.547	0.591	0.971	0.971	0.971	0.971	0.971	0.971
1998	0.121	0.381	0.629	0.679	1.116	1.116	1.116	1.116	1.116	1.116
1999	0.283	0.892	1.471	1.587	2.610	2.610	2.610	2.610	2.610	2.610
2000	0.078	0.245	0.404	0.436	0.717	0.717	0.717	0.717	0.717	0.717
2001	0.045	0.143	0.235	0.254	0.418	0.418	0.418	0.418	0.418	0.418

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.051	0.160	0.264	0.285	0.469	0.469	0.469	0.469	0.469	0.469
2003	0.066	0.208	0.342	0.369	0.607	0.607	0.607	0.607	0.607	0.607
2004	0.083	0.263	0.433	0.468	0.769	0.769	0.769	0.769	0.769	0.769
2005	0.108	0.342	0.564	0.609	1.001	1.001	1.001	1.001	1.001	1.001
2006	0.161	0.509	0.838	0.905	1.488	1.488	1.488	1.488	1.488	1.488
2007	0.126	0.397	0.655	0.707	1.163	1.163	1.163	1.163	1.163	1.163
2008	0.109	0.343	0.565	0.610	1.003	1.003	1.003	1.003	1.003	1.003
2009	0.196	0.620	1.022	1.103	1.813	1.813	1.813	1.813	1.813	1.813
2010	0.312	0.984	1.623	1.752	2.880	2.880	2.880	2.880	2.880	2.880
2011	0.247	0.778	1.283	1.385	2.277	2.277	2.277	2.277	2.277	2.277
2012	0.221	0.698	1.150	1.241	2.041	2.041	2.041	2.041	2.041	2.041
2013	0.214	0.675	1.113	1.202	1.976	1.976	1.976	1.976	1.976	1.976
2014	0.185	0.585	0.964	1.041	1.711	1.711	1.711	1.711	1.711	1.711
2015	0.158	0.497	0.820	0.885	1.456	1.456	1.456	1.456	1.456	1.456
2016	0.123	0.389	0.642	0.693	1.139	1.139	1.139	1.139	1.139	1.139
2017	0.127	0.402	0.662	0.715	1.176	1.176	1.176	1.176	1.176	1.176
2018	0.136	0.428	0.706	0.762	1.254	1.254	1.254	1.254	1.254	1.254
2019	0.110	0.347	0.573	0.618	1.016	1.016	1.016	1.016	1.016	1.016
2020	0.130	0.411	0.678	0.732	1.203	1.203	1.203	1.203	1.203	1.203
2021	0.098	0.310	0.511	0.552	0.907	0.907	0.907	0.907	0.907	0.907
2022	0.017	0.054	0.089	0.096	0.158	0.158	0.158	0.158	0.158	0.158