

## 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	340350.162	72392.559	224323.718	516388.699
NAA $\sigma$ (age 1)	1.173	0.119	0.962	1.430
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: Selectivity for age 1	0.108	0.015	0.081	0.141
Block 1: Selectivity for age 2	0.340	0.044	0.259	0.431
Block 1: Selectivity for age 3	0.559	0.069	0.423	0.687
Block 1: Selectivity for age 4	0.604	0.075	0.452	0.738
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	0.380	0.166	0.133	0.710
Block 3: Selectivity for age 5	0.183	0.083	0.070	0.399
Block 3: Selectivity for age 6	0.253	0.090	0.118	0.462
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	0.180	0.294	0.911
Block 4: Selectivity for age 5	0.463	0.119	0.252	0.688
Block 4: Selectivity for age 6	0.497	0.099	0.313	0.683
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: $\sigma$	31.292	1.088	29.230	33.499
Index 2 age comp, logistic-normal: $\sigma$	37.941	4.882	29.483	48.825
Index 3 age comp, logistic-normal: $\sigma$	35.187	3.109	29.592	41.839

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	5386927	1778930	284977	74843	42540	37025	29235	10662	81281	732
1969	2001701	4287910	1332354	201533	52306	26801	23326	18419	6717	51670
1970	2520764	1599807	3252982	962331	144097	34222	17535	15262	12051	38201
1971	764916	1996022	1178549	2238782	653074	86474	20537	10523	9159	30156
1972	600649	596997	1404788	752425	1400877	342645	45370	10775	5521	20627
1973	685371	470835	425982	917379	482467	765340	187197	24787	5887	14285
1974	1015367	527154	316411	252068	528789	220969	350524	85736	11352	9239
1975	1081419	774069	344457	178789	138227	222997	93185	147820	36156	8684
1976	147604	804790	468690	171716	85627	46587	75157	31406	49820	15112
1977	39992	105049	423134	185245	63991	19051	10365	16722	6988	14447
1978	19244	30977	72183	259711	111084	31290	9315	5068	8176	10481
1979	78058	15457	23876	53513	190999	76147	21449	6386	3474	12789
1980	24818	62557	11829	17492	38856	128190	51107	14396	4286	10916
1981	95362	19942	48273	8786	12891	26728	88179	35155	9902	10457
1982	281863	76004	14997	34367	6185	8219	17041	56220	22414	12980
1983	2252684	223747	56435	10456	23653	3799	5048	10467	34532	21740
1984	64789	1788818	166316	39417	7210	14574	2341	3111	6449	34673
1985	129698	51932	1369602	121956	28648	4847	9796	1573	2091	27642
1986	88170	103082	38710	961001	84512	17797	3011	6086	977	18471
1987	78569	70028	76669	27063	663352	52164	10985	1858	3756	12004
1988	333343	62318	51862	53227	18540	404342	31796	6696	1133	9607
1989	585484	261123	44371	33749	34000	10065	219512	17262	3635	5830
1990	122379	455777	182283	27950	20814	17416	5156	112439	8842	4848
1991	264925	92668	291521	99443	14756	8243	6897	2042	44528	5422
1992	157866	202821	61365	168379	55841	6472	3615	3025	895	21908
1993	47510	123236	142838	39220	105483	29354	3402	1900	1590	11987
1994	131938	37301	88373	94046	25372	58479	16274	1886	1054	7527
1995	49283	102091	25547	53950	56068	12287	28321	7881	913	4156
1996	286336	38536	72277	16469	34115	29933	6560	15120	4208	2706
1997	95383	215301	24107	38017	8358	12656	11104	2434	5609	2565
1998	41784	70380	126889	11496	17354	2602	3940	3457	758	2544

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

	1	2	3	4	5	6	7	8	9	10+
1999	92502	30331	39389	55578	4787	4640	696	1053	924	883
2000	1648190	56873	10042	7278	9105	273	265	40	60	103
2001	142206	1248635	36432	5492	3852	3622	109	105	16	65
2002	110440	111323	887192	23626	3495	2079	1954	59	57	44
2003	316662	85978	77725	559018	14575	1791	1065	1001	30	51
2004	603824	242897	57283	45345	317322	6508	800	476	447	36
2005	223162	455380	153386	30600	23401	121026	2482	305	181	184
2006	542973	164113	265554	71881	13708	7061	36519	749	92	110
2007	120310	378610	80886	94376	23880	2522	1299	6718	138	37
2008	210130	86870	208368	34464	38145	6077	642	331	1710	45
2009	88691	154396	50521	97212	15364	11418	1819	192	99	525
2010	53223	59764	68298	15030	26650	2056	1528	243	26	84
2011	134180	31952	18350	11147	2153	1219	94	70	11	5
2012	91215	86029	12078	4216	2311	181	103	8	6	1
2013	72799	59918	35110	3147	1002	244	19	11	1	1
2014	77541	48172	25026	9504	779	113	28	2	1	0
2015	154112	52802	22028	7863	2764	115	17	4	0	0
2016	260761	107742	26240	7936	2651	521	22	3	1	0
2017	34908	188611	59622	11282	3239	686	135	6	1	0
2018	127475	25146	103034	25095	4500	806	171	34	1	0
2019	80073	91133	13411	41688	9592	1044	187	40	8	0
2020	93354	58818	52951	6247	18555	2863	312	56	12	2
2021	112351	67390	32345	22532	2521	4711	727	79	14	4
2022	326993	83850	41174	16366	10966	873	1631	252	27	6

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.028	0.089	0.146	0.158	0.262	0.262	0.262	0.262	0.262	0.262
1969	0.024	0.076	0.125	0.135	0.224	0.224	0.224	0.224	0.224	0.224
1970	0.033	0.106	0.174	0.188	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	0.151	0.249	0.269	0.445	0.445	0.445	0.445	0.445	0.445
1972	0.044	0.138	0.226	0.244	0.405	0.405	0.405	0.405	0.405	0.405
1973	0.062	0.197	0.325	0.351	0.581	0.581	0.581	0.581	0.581	0.581
1974	0.071	0.226	0.371	0.401	0.663	0.663	0.663	0.663	0.663	0.663
1975	0.095	0.302	0.496	0.536	0.888	0.888	0.888	0.888	0.888	0.888
1976	0.140	0.443	0.728	0.787	1.303	1.303	1.303	1.303	1.303	1.303
1977	0.055	0.175	0.288	0.311	0.515	0.515	0.515	0.515	0.515	0.515
1978	0.019	0.060	0.099	0.107	0.178	0.178	0.178	0.178	0.178	0.178
1979	0.021	0.068	0.111	0.120	0.199	0.199	0.199	0.199	0.199	0.199
1980	0.019	0.059	0.097	0.105	0.174	0.174	0.174	0.174	0.174	0.174
1981	0.027	0.085	0.140	0.151	0.250	0.250	0.250	0.250	0.250	0.250
1982	0.031	0.098	0.161	0.174	0.287	0.287	0.287	0.287	0.287	0.287
1983	0.031	0.097	0.159	0.172	0.284	0.284	0.284	0.284	0.284	0.284
1984	0.021	0.067	0.110	0.119	0.197	0.197	0.197	0.197	0.197	0.197
1985	0.030	0.094	0.154	0.167	0.276	0.276	0.276	0.276	0.276	0.276
1986	0.030	0.096	0.158	0.171	0.283	0.283	0.283	0.283	0.283	0.283
1987	0.032	0.100	0.165	0.178	0.295	0.295	0.295	0.295	0.295	0.295
1988	0.044	0.140	0.230	0.248	0.411	0.411	0.411	0.411	0.411	0.411
1989	0.050	0.159	0.262	0.283	0.469	0.469	0.469	0.469	0.469	0.469
1990	0.078	0.247	0.406	0.439	0.726	0.726	0.726	0.726	0.726	0.726
1991	0.067	0.212	0.349	0.377	0.624	0.624	0.624	0.624	0.624	0.624
1992	0.048	0.151	0.248	0.268	0.443	0.443	0.443	0.443	0.443	0.443
1993	0.042	0.133	0.218	0.236	0.390	0.390	0.390	0.390	0.390	0.390
1994	0.056	0.178	0.293	0.317	0.525	0.525	0.525	0.525	0.525	0.525
1995	0.046	0.145	0.239	0.258	0.428	0.428	0.428	0.428	0.428	0.428
1996	0.085	0.269	0.442	0.478	0.792	0.792	0.792	0.792	0.792	0.792
1997	0.104	0.329	0.541	0.584	0.967	0.967	0.967	0.967	0.967	0.967
1998	0.120	0.380	0.626	0.676	1.119	1.119	1.119	1.119	1.119	1.119
1999	0.286	0.905	1.489	1.609	2.663	2.663	2.663	2.663	2.663	2.663
2000	0.078	0.245	0.403	0.436	0.722	0.722	0.722	0.722	0.722	0.722
2001	0.045	0.142	0.233	0.252	0.417	0.417	0.417	0.417	0.417	0.417

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.050	0.159	0.262	0.283	0.469	0.469	0.469	0.469	0.469	0.469
2003	0.065	0.206	0.339	0.366	0.606	0.606	0.606	0.606	0.606	0.606
2004	0.082	0.260	0.427	0.462	0.764	0.764	0.764	0.764	0.764	0.764
2005	0.107	0.339	0.558	0.603	0.998	0.998	0.998	0.998	0.998	0.998
2006	0.161	0.508	0.835	0.902	1.493	1.493	1.493	1.493	1.493	1.493
2007	0.126	0.397	0.653	0.706	1.168	1.168	1.168	1.168	1.168	1.168
2008	0.108	0.342	0.562	0.608	1.006	1.006	1.006	1.006	1.006	1.006
2009	0.195	0.616	1.012	1.094	1.811	1.811	1.811	1.811	1.811	1.811
2010	0.310	0.981	1.613	1.743	2.885	2.885	2.885	2.885	2.885	2.885
2011	0.244	0.773	1.271	1.374	2.274	2.274	2.274	2.274	2.274	2.274
2012	0.220	0.696	1.145	1.237	2.048	2.048	2.048	2.048	2.048	2.048
2013	0.213	0.673	1.107	1.196	1.980	1.980	1.980	1.980	1.980	1.980
2014	0.184	0.582	0.958	1.035	1.713	1.713	1.713	1.713	1.713	1.713
2015	0.158	0.499	0.821	0.887	1.469	1.469	1.469	1.469	1.469	1.469
2016	0.124	0.392	0.644	0.696	1.152	1.152	1.152	1.152	1.152	1.152
2017	0.128	0.405	0.665	0.719	1.190	1.190	1.190	1.190	1.190	1.190
2018	0.136	0.429	0.705	0.762	1.261	1.261	1.261	1.261	1.261	1.261
2019	0.108	0.343	0.564	0.609	1.009	1.009	1.009	1.009	1.009	1.009
2020	0.126	0.398	0.654	0.707	1.171	1.171	1.171	1.171	1.171	1.171
2021	0.093	0.293	0.481	0.520	0.861	0.861	0.861	0.861	0.861	0.861
2022	0.016	0.049	0.081	0.088	0.145	0.145	0.145	0.145	0.145	0.145