

## 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	357711.285	116686.572	188741.742	677949.468
NAA $\sigma$ (age 1)	1.035	0.108	0.843	1.269
NAA residual AR1 $\rho$ year	0.475	0.132	0.180	0.691
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	0.104	0.016	0.077	0.139
Block 1: Selectivity for age 2	0.323	0.044	0.243	0.415
Block 1: Selectivity for age 3	0.526	0.069	0.393	0.656
Block 1: Selectivity for age 4	0.583	0.078	0.427	0.723
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	0.368	0.168	0.123	0.706
Block 3: Selectivity for age 5	0.171	0.083	0.061	0.393
Block 3: Selectivity for age 6	0.264	0.097	0.118	0.489
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	0.586	0.151	0.294	0.828
Block 4: Selectivity for age 5	0.412	0.106	0.229	0.624
Block 4: Selectivity for age 6	0.472	0.092	0.303	0.648
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: $\sigma$	33.055	1.148	30.880	35.384
Index 2 age comp, logistic-normal: $\sigma$	39.690	5.215	30.678	51.349
Index 3 age comp, logistic-normal: $\sigma$	34.295	2.955	28.966	40.603

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	5339510	1825457	293686	77314	43988	38466	30424	10901	83297	738
1969	2152522	4252284	1371865	209123	54240	27627	24158	19107	6846	52778
1970	2433848	1720382	3231312	994670	149674	35254	17957	15702	12419	38754
1971	832319	1927097	1269971	2234775	675655	88936	20948	10670	9330	30407
1972	647607	649918	1362623	818805	1404639	351386	46253	10894	5549	20666
1973	678039	508073	466298	899668	528361	764235	191181	25165	5927	14263
1974	1017016	522358	344569	280879	524488	241488	349294	87380	11502	9228
1975	1060745	776866	345051	198837	156154	220955	101733	147150	36811	8733
1976	147169	790995	476324	176348	96645	52234	73910	34030	49222	15235
1977	39484	104781	420275	192768	66206	20752	11216	15870	7307	13840
1978	19820	30591	72319	260501	115994	31949	10014	5412	7659	10205
1979	69618	15928	23642	53898	192212	79439	21881	6858	3707	12234
1980	25593	55838	12237	17450	39345	129237	53412	14712	4611	10718
1981	99153	20579	43233	9147	12918	27099	89012	36788	10133	10558
1982	295728	79094	15545	31042	6476	8242	17290	56794	23472	13202
1983	2229902	234991	59035	10946	21510	3982	5068	10631	34920	22549
1984	74398	1771877	175380	41564	7584	13222	2448	3115	6535	35327
1985	134978	59630	1358306	128989	30222	5065	8831	1635	2081	27958
1986	82076	107249	44498	956143	89348	18571	3112	5426	1005	18458
1987	78639	65210	80017	31313	662057	54867	11404	1911	3332	11951
1988	333298	62443	48562	56136	21609	404224	33500	6963	1167	9332
1989	586083	261467	44791	32051	36210	11749	219781	18214	3786	5708
1990	132128	457019	184099	28680	19992	18586	6031	112814	9349	4873
1991	266695	100212	295311	102489	15324	7867	7314	2373	44392	5597
1992	154707	204383	66866	173227	58021	6660	3419	3179	1031	21725
1993	47751	120964	145111	43401	109689	30561	3508	1801	1674	11986
1994	89405	37562	87502	97097	28422	61212	17054	1957	1005	7623
1995	77988	69353	26022	54569	58822	13876	29884	8326	956	4212
1996	277644	61059	49442	17003	34810	31378	7402	15941	4441	2757
1997	97882	208729	38391	26327	8648	12587	11346	2677	5764	2603
1998	43693	72157	123509	18517	12002	2591	3772	3400	802	2507

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

	1	2	3	4	5	6	7	8	9	10+
1999	96911	31458	39688	52882	7399	2868	619	901	813	791
2000	1637226	59458	10546	7583	8653	382	148	32	47	83
2001	155206	1240984	38347	5853	4038	3385	149	58	13	51
2002	116223	121405	882252	24943	3715	2135	1790	79	31	33
2003	321025	90342	84646	555948	15285	1850	1063	891	39	32
2004	595360	246401	60570	50043	317470	6742	816	469	393	31
2005	237110	450663	158251	33387	26446	122594	2604	315	181	164
2006	550807	174861	266991	76477	15254	7954	36873	783	95	104
2007	95266	385131	87849	98629	25955	2754	1436	6658	141	36
2008	200074	69011	215889	38795	40783	6578	698	364	1687	45
2009	90814	147423	40777	103885	17640	12167	1962	208	109	517
2010	53111	61178	66004	12485	28642	2230	1538	248	26	79
2011	135400	31780	18980	11115	1776	1163	91	62	10	4
2012	92092	85088	11474	4093	2079	115	76	6	4	1
2013	73028	59767	33942	2911	916	184	10	7	1	0
2014	78371	48490	25587	9661	740	101	20	1	1	0
2015	149187	53606	22758	8460	2900	108	15	3	0	0
2016	258570	104492	27075	8480	2899	532	20	3	1	0
2017	39677	186784	58067	11788	3452	715	131	5	1	0
2018	116108	28494	101930	24545	4644	805	167	31	1	0
2019	79537	82841	15239	41692	9324	1018	176	37	7	0
2020	90683	58230	47985	7099	18289	2616	285	49	10	2
2021	112795	65048	31663	20165	2779	4218	603	66	11	3
2022	255426	83620	39168	15712	9486	879	1334	191	21	5

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.028	0.086	0.140	0.154	0.265	0.265	0.265	0.265	0.265	0.265
1969	0.024	0.075	0.122	0.134	0.231	0.231	0.231	0.231	0.231	0.231
1970	0.033	0.104	0.169	0.187	0.321	0.321	0.321	0.321	0.321	0.321

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

	1	2	3	4	5	6	7	8	9	10+
1971	0.047	0.147	0.239	0.264	0.454	0.454	0.454	0.454	0.454	0.454
1972	0.043	0.132	0.215	0.238	0.409	0.409	0.409	0.409	0.409	0.409
1973	0.061	0.188	0.307	0.340	0.583	0.583	0.583	0.583	0.583	0.583
1974	0.069	0.215	0.350	0.387	0.664	0.664	0.664	0.664	0.664	0.664
1975	0.093	0.289	0.471	0.521	0.895	0.895	0.895	0.895	0.895	0.895
1976	0.140	0.432	0.705	0.780	1.338	1.338	1.338	1.338	1.338	1.338
1977	0.055	0.171	0.278	0.308	0.529	0.529	0.529	0.529	0.529	0.529
1978	0.019	0.058	0.094	0.104	0.179	0.179	0.179	0.179	0.179	0.179
1979	0.021	0.064	0.104	0.115	0.197	0.197	0.197	0.197	0.197	0.197
1980	0.018	0.056	0.091	0.101	0.173	0.173	0.173	0.173	0.173	0.173
1981	0.026	0.081	0.131	0.145	0.249	0.249	0.249	0.249	0.249	0.249
1982	0.030	0.093	0.151	0.167	0.286	0.286	0.286	0.286	0.286	0.286
1983	0.030	0.093	0.151	0.167	0.287	0.287	0.287	0.287	0.287	0.287
1984	0.021	0.066	0.107	0.119	0.204	0.204	0.204	0.204	0.204	0.204
1985	0.030	0.093	0.151	0.167	0.287	0.287	0.287	0.287	0.287	0.287
1986	0.030	0.093	0.151	0.168	0.288	0.288	0.288	0.288	0.288	0.288
1987	0.031	0.095	0.154	0.171	0.293	0.293	0.293	0.293	0.293	0.293
1988	0.043	0.132	0.215	0.238	0.409	0.409	0.409	0.409	0.409	0.409
1989	0.049	0.151	0.246	0.272	0.467	0.467	0.467	0.467	0.467	0.467
1990	0.076	0.237	0.386	0.427	0.733	0.733	0.733	0.733	0.733	0.733
1991	0.066	0.205	0.333	0.369	0.633	0.633	0.633	0.633	0.633	0.633
1992	0.046	0.142	0.232	0.257	0.441	0.441	0.441	0.441	0.441	0.441
1993	0.040	0.124	0.202	0.223	0.383	0.383	0.383	0.383	0.383	0.383
1994	0.054	0.167	0.272	0.301	0.517	0.517	0.517	0.517	0.517	0.517
1995	0.045	0.138	0.226	0.250	0.428	0.428	0.428	0.428	0.428	0.428
1996	0.085	0.264	0.430	0.476	0.817	0.817	0.817	0.817	0.817	0.817
1997	0.105	0.325	0.529	0.586	1.005	1.005	1.005	1.005	1.005	1.005
1998	0.129	0.398	0.648	0.717	1.231	1.231	1.231	1.231	1.231	1.231
1999	0.289	0.893	1.455	1.610	2.764	2.764	2.764	2.764	2.764	2.764
2000	0.077	0.239	0.389	0.430	0.739	0.739	0.739	0.739	0.739	0.739
2001	0.046	0.141	0.230	0.255	0.437	0.437	0.437	0.437	0.437	0.437

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.052	0.161	0.262	0.290	0.497	0.497	0.497	0.497	0.497	0.497
2003	0.065	0.200	0.326	0.360	0.618	0.618	0.618	0.618	0.618	0.618
2004	0.078	0.243	0.396	0.438	0.752	0.752	0.752	0.752	0.752	0.752
2005	0.105	0.324	0.527	0.583	1.001	1.001	1.001	1.001	1.001	1.001
2006	0.158	0.488	0.796	0.881	1.512	1.512	1.512	1.512	1.512	1.512
2007	0.122	0.379	0.617	0.683	1.173	1.173	1.173	1.173	1.173	1.173
2008	0.105	0.326	0.531	0.588	1.010	1.010	1.010	1.010	1.010	1.010
2009	0.195	0.604	0.984	1.088	1.868	1.868	1.868	1.868	1.868	1.868
2010	0.314	0.970	1.581	1.750	3.004	3.004	3.004	3.004	3.004	3.004
2011	0.265	0.819	1.334	1.476	2.534	2.534	2.534	2.534	2.534	2.534
2012	0.232	0.719	1.172	1.297	2.226	2.226	2.226	2.226	2.226	2.226
2013	0.209	0.648	1.057	1.169	2.007	2.007	2.007	2.007	2.007	2.007
2014	0.180	0.556	0.907	1.003	1.722	1.722	1.722	1.722	1.722	1.722
2015	0.156	0.483	0.787	0.871	1.495	1.495	1.495	1.495	1.495	1.495
2016	0.125	0.388	0.631	0.699	1.200	1.200	1.200	1.200	1.200	1.200
2017	0.131	0.406	0.661	0.732	1.256	1.256	1.256	1.256	1.256	1.256
2018	0.138	0.426	0.694	0.768	1.318	1.318	1.318	1.318	1.318	1.318
2019	0.112	0.346	0.564	0.624	1.071	1.071	1.071	1.071	1.071	1.071
2020	0.132	0.409	0.667	0.738	1.267	1.267	1.267	1.267	1.267	1.267
2021	0.099	0.307	0.501	0.554	0.951	0.951	0.951	0.951	0.951	0.951
2022	0.017	0.054	0.088	0.097	0.167	0.167	0.167	0.167	0.167	0.167