

## 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	334423.607	70684.077	220996.908	506066.577
NAA $\sigma$ (age 1)	1.166	0.118	0.956	1.423
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	0.104	0.015	0.077	0.138
Block 1: Selectivity for age 2	0.321	0.043	0.243	0.412
Block 1: Selectivity for age 3	0.522	0.067	0.392	0.649
Block 1: Selectivity for age 4	0.576	0.075	0.427	0.713
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	0.364	0.166	0.123	0.699
Block 3: Selectivity for age 5	0.169	0.082	0.061	0.389
Block 3: Selectivity for age 6	0.261	0.096	0.117	0.484
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	0.587	0.153	0.293	0.830
Block 4: Selectivity for age 5	0.410	0.107	0.227	0.623
Block 4: Selectivity for age 6	0.469	0.092	0.300	0.646
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: $\sigma$	32.994	1.145	30.825	35.316
Index 2 age comp, logistic-normal: $\sigma$	39.828	5.249	30.761	51.568
Index 3 age comp, logistic-normal: $\sigma$	34.665	2.994	29.266	41.059

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	5628816	1782475	283557	74606	42517	37147	29346	10572	80666	719
1969	1977323	4481474	1338171	201672	52283	26577	23221	18344	6609	50874
1970	2383514	1580597	3406482	971138	144516	33971	17269	15088	11919	37349
1971	758053	1887851	1167663	2360263	661185	85922	20197	10267	8970	29293
1972	614866	592120	1335755	754309	1487253	343711	44666	10499	5337	19891
1973	647356	482800	425826	885985	489380	813277	187952	24425	5741	13795
1974	986012	499182	328224	257800	519650	224645	373327	86278	11212	8968
1975	1063890	753895	330541	190393	144228	219768	95006	157886	36488	8535
1976	142900	794034	463175	169780	93121	48311	73615	31824	52887	15081
1977	40474	101874	423167	188855	64339	20037	10395	15840	6847	14624
1978	19820	31354	70257	262222	113653	30881	9617	4989	7603	10306
1979	76670	15926	24219	52333	193391	77626	21092	6569	3408	12232
1980	24972	61493	12232	17875	38205	129780	52093	14155	4408	10495
1981	100030	20079	47602	9144	13235	26274	89249	35824	9734	10249
1982	279326	79797	15166	34191	6478	8430	16736	56852	22820	12729
1983	2259870	221958	59546	10681	23702	3974	5172	10267	34876	21808
1984	65088	1795483	165557	41908	7399	14521	2435	3168	6290	34727
1985	138982	52168	1376124	121772	30479	4933	9681	1623	2112	27345
1986	82255	110422	38911	968493	84350	18672	3022	5931	994	18047
1987	76636	65346	82339	27372	670510	51628	11429	1850	3630	11654
1988	330881	60866	48687	57844	18923	409355	31519	6977	1129	9331
1989	592986	259659	43692	32198	37406	10289	222582	17138	3794	5688
1990	123516	462530	182918	28025	20129	19181	5276	114137	8788	4862
1991	271481	93709	298984	102037	15016	7898	7526	2070	44785	5356
1992	157120	208079	62522	175574	57865	6502	3420	3259	896	21710
1993	46896	122859	147718	40608	111296	30394	3415	1796	1712	11874
1994	92161	36900	88926	99010	26652	62094	16957	1905	1002	7580
1995	76926	71518	25583	55582	60155	13006	30301	8275	930	4188
1996	278410	60262	51060	16770	35594	32160	6953	16199	4424	2736
1997	96839	209583	38023	27386	8604	12953	11703	2530	5895	2606
1998	42600	71480	124417	18471	12594	2590	3899	3523	762	2559

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

	1	2	3	4	5	6	7	8	9	10+
1999	91139	30684	39330	53429	7413	2993	615	927	837	789
2000	1672133	55599	10085	7316	8506	354	143	29	44	78
2001	139744	1267592	35850	5603	3902	3312	138	56	11	48
2002	109151	109368	902325	23388	3569	2067	1754	73	30	31
2003	310621	84883	76331	570087	14380	1778	1030	874	36	30
2004	592426	238536	56972	45261	326772	6343	784	454	385	29
2005	216199	449014	153717	31622	24117	126992	2465	305	177	161
2006	574451	159595	266605	74698	14547	7264	38250	742	92	102
2007	87803	401699	80107	98630	25423	2598	1297	6830	133	35
2008	200821	63610	225025	35418	40875	6389	653	326	1716	42
2009	90383	148061	37626	108679	16183	12167	1902	194	97	523
2010	51941	61001	66580	11644	30365	2052	1543	241	25	79
2011	137228	31175	19061	11409	1693	1240	84	63	10	4
2012	92428	86482	11333	4176	2177	111	81	5	4	1
2013	73584	60040	34536	2892	943	191	10	7	0	0
2014	78128	48890	25715	9875	740	103	21	1	1	0
2015	146886	53492	22984	8553	2988	108	15	3	0	0
2016	265151	102865	26973	8566	2935	541	20	3	1	0
2017	35695	191462	57040	11730	3486	715	132	5	1	0
2018	125122	25617	104167	24051	4613	800	164	30	1	0
2019	80177	89284	13692	42673	9162	1002	174	36	7	0
2020	94608	58789	51919	6432	18911	2586	283	49	10	2
2021	113750	68172	32387	22341	2587	4512	617	67	12	3
2022	308140	84806	41743	16546	10862	858	1496	205	22	5

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.028	0.087	0.141	0.156	0.270	0.270	0.270	0.270	0.270	0.270
1969	0.024	0.074	0.121	0.133	0.231	0.231	0.231	0.231	0.231	0.231
1970	0.033	0.103	0.167	0.184	0.320	0.320	0.320	0.320	0.320	0.320

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

	1	2	3	4	5	6	7	8	9	10+
1971	0.047	0.146	0.237	0.262	0.454	0.454	0.454	0.454	0.454	0.454
1972	0.042	0.130	0.211	0.233	0.404	0.404	0.404	0.404	0.404	0.404
1973	0.060	0.186	0.302	0.334	0.579	0.579	0.579	0.579	0.579	0.579
1974	0.068	0.212	0.345	0.381	0.661	0.661	0.661	0.661	0.661	0.661
1975	0.093	0.287	0.466	0.515	0.894	0.894	0.894	0.894	0.894	0.894
1976	0.138	0.429	0.697	0.770	1.336	1.336	1.336	1.336	1.336	1.336
1977	0.055	0.172	0.279	0.308	0.534	0.534	0.534	0.534	0.534	0.534
1978	0.019	0.058	0.095	0.104	0.181	0.181	0.181	0.181	0.181	0.181
1979	0.021	0.064	0.104	0.115	0.199	0.199	0.199	0.199	0.199	0.199
1980	0.018	0.056	0.091	0.101	0.174	0.174	0.174	0.174	0.174	0.174
1981	0.026	0.081	0.131	0.145	0.251	0.251	0.251	0.251	0.251	0.251
1982	0.030	0.093	0.151	0.166	0.289	0.289	0.289	0.289	0.289	0.289
1983	0.030	0.093	0.151	0.167	0.290	0.290	0.290	0.290	0.290	0.290
1984	0.021	0.066	0.107	0.118	0.205	0.205	0.205	0.205	0.205	0.205
1985	0.030	0.093	0.151	0.167	0.290	0.290	0.290	0.290	0.290	0.290
1986	0.030	0.093	0.152	0.168	0.291	0.291	0.291	0.291	0.291	0.291
1987	0.030	0.094	0.153	0.169	0.293	0.293	0.293	0.293	0.293	0.293
1988	0.042	0.132	0.214	0.236	0.409	0.409	0.409	0.409	0.409	0.409
1989	0.048	0.150	0.244	0.270	0.468	0.468	0.468	0.468	0.468	0.468
1990	0.076	0.236	0.384	0.424	0.736	0.736	0.736	0.736	0.736	0.736
1991	0.066	0.205	0.332	0.367	0.637	0.637	0.637	0.637	0.637	0.637
1992	0.046	0.143	0.232	0.256	0.444	0.444	0.444	0.444	0.444	0.444
1993	0.040	0.123	0.200	0.221	0.384	0.384	0.384	0.384	0.384	0.384
1994	0.054	0.166	0.270	0.298	0.517	0.517	0.517	0.517	0.517	0.517
1995	0.044	0.137	0.222	0.246	0.426	0.426	0.426	0.426	0.426	0.426
1996	0.084	0.261	0.423	0.467	0.811	0.811	0.811	0.811	0.811	0.811
1997	0.104	0.321	0.522	0.577	1.001	1.001	1.001	1.001	1.001	1.001
1998	0.128	0.397	0.645	0.713	1.237	1.237	1.237	1.237	1.237	1.237
1999	0.294	0.913	1.482	1.638	2.841	2.841	2.841	2.841	2.841	2.841
2000	0.077	0.239	0.388	0.428	0.743	0.743	0.743	0.743	0.743	0.743
2001	0.045	0.140	0.227	0.251	0.435	0.435	0.435	0.435	0.435	0.435

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.051	0.160	0.259	0.286	0.497	0.497	0.497	0.497	0.497	0.497
2003	0.064	0.199	0.323	0.357	0.618	0.618	0.618	0.618	0.618	0.618
2004	0.077	0.239	0.389	0.430	0.745	0.745	0.745	0.745	0.745	0.745
2005	0.104	0.321	0.522	0.576	1.000	1.000	1.000	1.000	1.000	1.000
2006	0.158	0.489	0.794	0.878	1.523	1.523	1.523	1.523	1.523	1.523
2007	0.122	0.379	0.616	0.681	1.181	1.181	1.181	1.181	1.181	1.181
2008	0.105	0.325	0.528	0.583	1.012	1.012	1.012	1.012	1.012	1.012
2009	0.193	0.599	0.973	1.075	1.865	1.865	1.865	1.865	1.865	1.865
2010	0.310	0.963	1.564	1.728	2.998	2.998	2.998	2.998	2.998	2.998
2011	0.262	0.812	1.318	1.457	2.527	2.527	2.527	2.527	2.527	2.527
2012	0.231	0.718	1.166	1.288	2.235	2.235	2.235	2.235	2.235	2.235
2013	0.209	0.648	1.052	1.162	2.017	2.017	2.017	2.017	2.017	2.017
2014	0.179	0.555	0.901	0.995	1.727	1.727	1.727	1.727	1.727	1.727
2015	0.156	0.485	0.787	0.870	1.509	1.509	1.509	1.509	1.509	1.509
2016	0.126	0.390	0.633	0.699	1.213	1.213	1.213	1.213	1.213	1.213
2017	0.132	0.409	0.664	0.733	1.272	1.272	1.272	1.272	1.272	1.272
2018	0.137	0.426	0.692	0.765	1.327	1.327	1.327	1.327	1.327	1.327
2019	0.110	0.342	0.556	0.614	1.065	1.065	1.065	1.065	1.065	1.065
2020	0.128	0.396	0.643	0.711	1.233	1.233	1.233	1.233	1.233	1.233
2021	0.094	0.290	0.472	0.521	0.904	0.904	0.904	0.904	0.904	0.904
2022	0.016	0.049	0.080	0.088	0.153	0.153	0.153	0.153	0.153	0.153