

## 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
Index 1 fully selected q	0.003	0.000	0.002	0.003
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	0.143	0.017	0.113	0.179
Block 1: Mean Selectivity for age 2	0.468	0.037	0.397	0.540
Block 1: Mean Selectivity for age 3	0.749	0.036	0.672	0.813
Block 1: Mean Selectivity for age 4	0.845	0.035	0.765	0.902
Block 1: Mean Selectivity for age 5	0.876	0.032	0.799	0.926
Block 1: Mean Selectivity for age 6	0.902	0.028	0.831	0.945
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	—	—	—
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	—	—	—

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 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	0.664	0.114	0.420	0.844
Block 3: Selectivity for age 5	0.419	0.134	0.196	0.680
Block 3: Selectivity for age 6	0.501	0.194	0.180	0.821
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	0.678	0.076	0.515	0.806
Block 4: Selectivity for age 5	0.607	0.082	0.441	0.752
Block 4: Selectivity for age 6	0.724	0.104	0.487	0.879
Block 4: Selectivity for age 7	0.000	—	—	—
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 $\sigma$	0.928	0.076	0.791	1.090

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

	Estimate	Std. Error	95% CI lower	95% CI upper
Fleet 1 age comp, Dirichlet: dispersion ( $\phi$ )	388.109	41.471	314.775	478.529
Index 2 age comp, Dirichlet: dispersion ( $\phi$ )	14.096	3.970	8.116	24.482
Index 3 age comp, Dirichlet: dispersion ( $\phi$ )	15.961	2.328	11.992	21.244

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	4794631	1468124	448123	145930	72025	44890	15949	15293	72066	2666
1969	1810424	3787901	1145090	311206	95269	47326	29537	10226	9805	47916
1970	2186579	1472741	2879589	803114	212767	68266	32770	19878	6882	38846
1971	1073632	1630226	1155128	1922737	526119	141947	44668	20822	12630	29055
1972	1148538	811151	1074096	825884	1070643	275867	76177	22653	10560	21141
1973	915493	915636	581131	638459	503568	533481	138372	36492	10852	15186
1974	1277868	617282	516514	277107	324060	252435	255663	62330	16438	11729
1975	1286441	961224	301393	221580	124954	158612	111128	102502	24990	11293
1976	191783	763400	452431	145989	94880	53445	70586	44298	40859	14463
1977	48454	141884	319698	148013	49199	30430	17299	20801	13054	16303
1978	57077	35211	88494	176978	81230	29827	16793	9162	11016	15548
1979	144854	46413	26739	63344	124582	57253	20949	11514	6282	18213
1980	32949	113112	30581	19873	45007	84956	36797	13172	7239	15401
1981	121190	26149	83042	21155	14097	32055	59939	24973	8940	15366
1982	420006	84559	17912	57841	14226	9501	21520	39470	16445	16005
1983	2272799	330177	60104	12288	39610	9980	6317	14081	25826	21233
1984	91896	1791853	243856	42430	8723	28286	7083	4377	9757	32609
1985	191807	74350	1416235	169888	30130	5896	18911	4627	2860	27680
1986	108041	135806	58091	1023547	113159	20376	3897	12195	2984	19694
1987	114974	85057	90064	38717	735224	72524	13240	2425	7588	14111
1988	356185	89516	54971	55194	23792	488656	43525	7690	1408	12602
1989	478584	269349	60702	34258	33372	11569	307624	20116	3554	6475
1990	108412	383187	199588	38286	20890	20123	6828	175206	11457	5712
1991	191301	83289	274189	108554	20054	10502	10158	3225	82742	8108
1992	184288	153112	51919	168950	63857	10524	5444	5048	1602	45145
1993	38049	145124	111803	34215	108837	36005	5893	2902	2691	24919
1994	151498	25901	108948	80908	19900	64434	17824	2746	1352	12865
1995	177887	111421	16118	68526	48091	11267	35734	9481	1461	7562
1996	160259	135792	76826	10222	42767	30360	6809	20905	5546	5278
1997	213542	121689	84894	38440	5618	21571	15196	3202	9833	5091
1998	99953	162314	75586	44340	18151	2715	10021	6589	1389	6471

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

	1	2	3	4	5	6	7	8	9	10+
1999	172461	78292	101170	41729	19780	7785	1153	3962	2605	3108
2000	1265658	135628	51649	52886	17118	7526	2947	403	1385	1998
2001	194207	997801	95846	33293	31244	9769	4254	1613	221	1852
2002	162217	151719	749484	54096	18184	16728	5230	2158	818	1051
2003	390418	121999	104998	482594	33009	10907	9841	2987	1232	1068
2004	738476	309184	73692	59458	277729	17843	5863	5082	1543	1188
2005	196043	543665	175260	38637	27203	122479	7606	2345	2033	1092
2006	378877	144081	341235	79041	15851	10935	46162	2693	830	1106
2007	92089	267055	84421	128067	22017	4492	3023	11268	657	473
2008	234280	69754	158003	30051	39861	6460	1344	808	3011	302
2009	195524	161319	32707	67276	9867	12911	2035	386	232	952
2010	44686	110451	54989	8391	16756	2318	2982	405	77	235
2011	141882	18983	29267	7961	1153	2307	307	316	43	33
2012	83404	100067	6992	7993	1500	218	381	45	46	11
2013	51579	60545	39058	1940	2267	397	55	84	10	13
2014	86955	33784	30147	10794	539	527	94	11	17	5
2015	133952	55913	14992	11043	3645	196	176	28	3	7
2016	293936	89680	25144	7178	5104	1545	79	66	11	4
2017	35285	211629	46889	12010	3000	2108	616	29	25	5
2018	110375	25992	112093	22547	5339	1243	863	235	11	11
2019	55472	81991	18547	42754	6316	1600	357	220	60	6
2020	73937	39282	48678	7539	16094	2365	583	119	73	22
2021	104119	53888	20554	14314	2229	3952	598	129	26	21
2022	439767	79242	27625	6662	3772	583	1149	139	30	11

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.036	0.049	0.165	0.226	0.220	0.219	0.244	0.244	0.244	0.244
1969	0.006	0.074	0.155	0.180	0.133	0.168	0.196	0.196	0.196	0.196
1970	0.094	0.043	0.204	0.223	0.205	0.224	0.254	0.254	0.254	0.254

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

	1	2	3	4	5	6	7	8	9	10+
1971	0.080	0.217	0.136	0.385	0.446	0.422	0.479	0.479	0.479	0.479
1972	0.027	0.133	0.320	0.295	0.497	0.490	0.536	0.536	0.536	0.536
1973	0.194	0.373	0.541	0.478	0.491	0.536	0.598	0.598	0.598	0.598
1974	0.085	0.517	0.646	0.596	0.514	0.620	0.714	0.714	0.714	0.714
1975	0.322	0.554	0.525	0.648	0.649	0.610	0.720	0.720	0.720	0.720
1976	0.101	0.670	0.917	0.888	0.937	0.928	1.022	1.022	1.022	1.022
1977	0.119	0.272	0.391	0.400	0.300	0.394	0.436	0.436	0.436	0.436
1978	0.007	0.075	0.134	0.151	0.150	0.153	0.177	0.177	0.177	0.177
1979	0.047	0.217	0.097	0.142	0.183	0.242	0.264	0.264	0.264	0.264
1980	0.031	0.109	0.168	0.143	0.139	0.149	0.188	0.188	0.188	0.188
1981	0.160	0.178	0.162	0.197	0.195	0.198	0.218	0.218	0.218	0.218
1982	0.041	0.141	0.177	0.179	0.154	0.208	0.224	0.224	0.224	0.224
1983	0.038	0.103	0.148	0.143	0.137	0.143	0.167	0.167	0.167	0.167
1984	0.012	0.035	0.161	0.142	0.192	0.203	0.226	0.226	0.226	0.226
1985	0.145	0.047	0.125	0.206	0.191	0.214	0.239	0.239	0.239	0.239
1986	0.039	0.211	0.206	0.131	0.245	0.231	0.274	0.274	0.274	0.274
1987	0.050	0.237	0.290	0.287	0.209	0.311	0.343	0.343	0.343	0.343
1988	0.079	0.188	0.273	0.303	0.521	0.263	0.572	0.572	0.572	0.572
1989	0.022	0.100	0.261	0.295	0.306	0.327	0.363	0.363	0.363	0.363
1990	0.064	0.135	0.409	0.447	0.488	0.484	0.550	0.550	0.550	0.550
1991	0.023	0.273	0.284	0.331	0.445	0.457	0.499	0.499	0.499	0.499
1992	0.039	0.114	0.217	0.240	0.373	0.380	0.429	0.429	0.429	0.429
1993	0.185	0.087	0.123	0.342	0.324	0.503	0.564	0.564	0.564	0.564
1994	0.107	0.274	0.264	0.320	0.369	0.390	0.431	0.431	0.431	0.431
1995	0.070	0.172	0.255	0.271	0.260	0.304	0.336	0.336	0.336	0.336
1996	0.075	0.270	0.492	0.399	0.484	0.492	0.554	0.554	0.554	0.554
1997	0.074	0.276	0.449	0.550	0.527	0.567	0.636	0.636	0.636	0.636
1998	0.044	0.273	0.394	0.607	0.647	0.657	0.728	0.728	0.728	0.728
1999	0.040	0.216	0.449	0.691	0.766	0.771	0.851	0.851	0.851	0.851
2000	0.038	0.147	0.239	0.326	0.361	0.370	0.403	0.403	0.403	0.403
2001	0.047	0.086	0.372	0.405	0.425	0.425	0.479	0.479	0.479	0.479

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.085	0.168	0.240	0.294	0.311	0.330	0.360	0.360	0.360	0.360
2003	0.033	0.304	0.369	0.353	0.415	0.421	0.461	0.461	0.461	0.461
2004	0.106	0.368	0.446	0.582	0.619	0.653	0.717	0.717	0.717	0.717
2005	0.108	0.266	0.596	0.691	0.711	0.776	0.838	0.838	0.838	0.838
2006	0.150	0.335	0.780	1.078	1.061	1.086	1.210	1.210	1.210	1.210
2007	0.078	0.325	0.833	0.967	1.026	1.007	1.120	1.120	1.120	1.120
2008	0.173	0.557	0.654	0.914	0.927	0.955	1.047	1.047	1.047	1.047
2009	0.371	0.876	1.160	1.190	1.249	1.266	1.415	1.415	1.415	1.415
2010	0.656	1.128	1.733	1.785	1.783	1.821	2.045	2.045	2.045	2.045
2011	0.149	0.799	1.098	1.469	1.464	1.601	1.726	1.726	1.726	1.726
2012	0.120	0.741	1.082	1.060	1.129	1.181	1.307	1.307	1.307	1.307
2013	0.223	0.497	1.086	1.081	1.258	1.244	1.377	1.377	1.377	1.377
2014	0.242	0.612	0.804	0.886	0.814	0.900	1.008	1.008	1.008	1.008
2015	0.201	0.599	0.536	0.572	0.658	0.702	0.778	0.778	0.778	0.778
2016	0.129	0.448	0.539	0.672	0.684	0.720	0.790	0.790	0.790	0.790
2017	0.106	0.436	0.532	0.611	0.682	0.694	0.762	0.762	0.762	0.762
2018	0.097	0.137	0.764	1.073	1.005	1.047	1.168	1.168	1.168	1.168
2019	0.145	0.321	0.700	0.777	0.782	0.810	0.898	0.898	0.898	0.898
2020	0.116	0.448	1.024	1.019	1.204	1.175	1.305	1.305	1.305	1.305
2021	0.073	0.468	0.927	1.134	1.142	1.036	1.262	1.262	1.262	1.262
2022	0.020	0.075	0.091	0.100	0.092	0.104	0.117	0.117	0.117	0.117