

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	341646.554	66535.354	233241.767	500435.103
NAA σ (age 1)	1.059	0.112	0.860	1.304
NAA σ (age 2-10+)	0.232	0.039	0.167	0.322
NAA residual AR1 ρ age	0.000	—	—	—
NAA residual AR1 ρ 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: a_{50}	2.233	0.122	2.002	2.481
Block 1: 1/slope (increasing)	0.667	0.050	0.575	0.773
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	—	—	—
Block 2: Selectivity for age 10+	1.000	—	—	—
Block 3: Selectivity for age 1	0.000	—	—	—
Block 3: Selectivity for age 2	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 3: Selectivity for age 3	1.000	—	—	—
Block 3: Selectivity for age 4	0.519	0.157	0.239	0.787
Block 3: Selectivity for age 5	0.280	0.111	0.117	0.534
Block 3: Selectivity for age 6	0.272	0.108	0.114	0.522
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	0.765	0.114	0.484	0.919
Block 4: Selectivity for age 5	0.612	0.119	0.372	0.808
Block 4: Selectivity for age 6	0.538	0.114	0.322	0.741
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	—	—	—
Fleet 1 age comp, logistic-normal: σ	16.237	1.563	13.445	19.609
Fleet 1 age comp, logistic-normal: ρ	0.910	0.019	0.864	0.941
Index 2 age comp, logistic-normal: σ	53.915	8.710	39.282	73.999
Index 2 age comp, logistic-normal: ρ	0.593	0.157	0.290	0.839

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

	Estimate	Std. Error	95% CI lower	95% CI upper
Index 3 age comp, logistic-normal: σ	14.783	1.594	11.966	18.262
Index 3 age comp, logistic-normal: ρ	0.704	0.082	0.524	0.837

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	7156968	1352292	490499	134493	67069	54715	22015	24245	112315	1152
1969	717841	5217380	1186830	360824	73144	42556	33133	20280	15696	71808
1970	2814487	652314	3690417	924670	213719	47718	27471	24968	15727	54663
1971	1067715	1985492	663796	2377429	607118	130107	30197	18365	16622	43627
1972	743068	815395	1256528	611452	1350177	308396	76298	15099	12456	32268
1973	786110	635433	549986	700184	485413	724923	157651	40711	9268	22847
1974	952827	568494	441443	270459	358919	280379	324279	75964	18900	14327
1975	1292860	808210	295576	234971	120381	167870	133063	132053	33107	13421
1976	172356	885459	472618	134878	88749	45574	65540	51253	43740	16935
1977	62697	133185	363411	162835	40653	25056	13063	19554	13871	16371
1978	38781	43025	91107	192149	84145	24431	12888	6164	11396	16291
1979	115833	41385	21743	64274	133559	59062	18815	8213	4577	18607
1980	31027	94987	25813	15683	44511	87802	36888	12130	5648	14666
1981	152751	23487	70882	14738	12395	33042	59130	23237	8467	13097
1982	424548	103164	14329	54226	7096	8960	22349	38869	14064	13852
1983	1738904	335587	66846	9869	34903	4075	4430	17540	24093	18005
1984	48333	1352891	269725	37992	6345	22984	2567	2632	11450	29120
1985	348895	37743	1105890	194179	21859	4218	17894	1734	1742	28261
1986	115839	200663	40618	755637	127296	13336	2671	13484	1048	19538
1987	109744	94658	100915	34722	557550	75395	9088	1709	9167	13130
1988	395444	88056	58488	50801	24322	362387	41842	4918	1175	13012
1989	433131	298592	59468	34165	28091	10600	259468	18635	2762	7635
1990	157851	365521	212826	33241	20294	16534	5223	162541	9715	5588
1991	135454	119879	272373	114858	15965	9685	7830	2798	71876	6998
1992	149034	120015	65921	166805	65940	8578	4759	3941	1660	37217
1993	64411	114015	88118	40267	104763	36781	5259	2466	2533	20089
1994	186871	36313	96114	64781	21541	63985	19867	2976	1385	11486
1995	197064	130578	18320	63143	41086	10941	33572	10307	1507	6017
1996	159067	138768	85239	8791	39621	26451	6098	18757	5579	3903
1997	212288	117219	78705	36623	3892	16724	11622	2687	7794	3906
1998	81760	163904	66854	36123	12053	1562	6380	4850	958	4227

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

	1	2	3	4	5	6	7	8	9	10+
1999	120827	64817	90107	30221	13365	3955	521	2377	1677	1741
2000	706947	95284	37097	36119	10402	4200	1139	174	767	989
2001	188048	572169	65899	19936	17923	4584	1706	431	94	685
2002	215855	142870	541058	33680	10176	8668	2452	679	181	343
2003	353961	153580	97359	340640	19377	4997	4100	1226	269	256
2004	678221	298592	74286	48119	179352	8809	2299	1378	588	229
2005	215391	524018	153982	25844	14217	60424	2543	718	265	230
2006	498977	152619	322921	52948	7039	3952	18335	688	157	119
2007	105727	340728	79069	100316	11430	1368	841	4064	132	50
2008	229312	73874	186443	25609	29639	2688	329	199	1072	44
2009	198515	157841	36142	73433	7696	10378	719	90	48	363
2010	52183	117724	56488	7032	12067	1068	1632	119	8	61
2011	145646	24346	29163	5088	413	631	51	76	5	3
2012	79090	101874	8102	7233	799	72	90	8	11	1
2013	59482	54865	42229	1634	1447	106	11	13	1	2
2014	96635	36765	27334	11957	436	277	16	2	3	1
2015	138021	59163	16623	9617	2789	161	45	4	1	1
2016	321394	93303	23867	5367	2729	768	41	10	1	0
2017	30949	236212	45456	8933	1689	910	208	12	3	0
2018	129448	20615	129587	18551	3423	496	303	58	4	1
2019	73150	81142	14192	49537	6139	1375	165	94	18	2
2020	93635	48769	45537	6559	17174	2237	599	47	32	7
2021	97256	64268	23839	13946	1843	4171	575	149	12	10
2022	291785	74544	32251	9357	4456	408	1613	180	46	7

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.024	0.073	0.134	0.165	0.174	0.176	0.176	0.177	0.177	0.177
1969	0.021	0.065	0.118	0.146	0.154	0.155	0.156	0.156	0.156	0.156
1970	0.030	0.091	0.167	0.206	0.217	0.219	0.220	0.220	0.220	0.220

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

	1	2	3	4	5	6	7	8	9	10+
1971	0.047	0.142	0.260	0.320	0.337	0.341	0.342	0.342	0.342	0.342
1972	0.050	0.151	0.277	0.340	0.359	0.363	0.364	0.365	0.365	0.365
1973	0.073	0.223	0.409	0.502	0.529	0.536	0.537	0.538	0.538	0.538
1974	0.087	0.264	0.485	0.596	0.628	0.636	0.638	0.638	0.638	0.638
1975	0.111	0.338	0.620	0.762	0.803	0.813	0.815	0.816	0.816	0.816
1976	0.147	0.446	0.819	1.006	1.061	1.074	1.077	1.077	1.078	1.078
1977	0.061	0.185	0.339	0.417	0.440	0.445	0.446	0.447	0.447	0.447
1978	0.022	0.068	0.125	0.153	0.162	0.164	0.164	0.164	0.164	0.164
1979	0.030	0.090	0.166	0.204	0.215	0.218	0.218	0.219	0.219	0.219
1980	0.026	0.079	0.144	0.177	0.187	0.189	0.190	0.190	0.190	0.190
1981	0.035	0.106	0.194	0.238	0.251	0.254	0.255	0.255	0.255	0.255
1982	0.034	0.104	0.191	0.235	0.248	0.251	0.251	0.252	0.252	0.252
1983	0.032	0.096	0.176	0.217	0.228	0.231	0.232	0.232	0.232	0.232
1984	0.023	0.069	0.127	0.157	0.165	0.167	0.168	0.168	0.168	0.168
1985	0.030	0.091	0.167	0.205	0.217	0.219	0.220	0.220	0.220	0.220
1986	0.029	0.089	0.164	0.202	0.212	0.215	0.216	0.216	0.216	0.216
1987	0.041	0.125	0.230	0.283	0.298	0.302	0.302	0.303	0.303	0.303
1988	0.055	0.166	0.305	0.375	0.395	0.400	0.401	0.402	0.402	0.402
1989	0.051	0.155	0.284	0.349	0.368	0.373	0.374	0.374	0.374	0.374
1990	0.071	0.216	0.397	0.488	0.514	0.521	0.522	0.522	0.522	0.522
1991	0.059	0.178	0.326	0.401	0.423	0.428	0.429	0.429	0.430	0.430
1992	0.044	0.135	0.247	0.304	0.320	0.324	0.325	0.325	0.325	0.325
1993	0.047	0.142	0.260	0.320	0.337	0.341	0.342	0.342	0.342	0.342
1994	0.058	0.177	0.326	0.400	0.422	0.427	0.428	0.429	0.429	0.429
1995	0.048	0.145	0.267	0.328	0.346	0.350	0.351	0.351	0.351	0.351
1996	0.084	0.255	0.469	0.576	0.607	0.615	0.616	0.617	0.617	0.617
1997	0.101	0.306	0.561	0.690	0.727	0.736	0.738	0.738	0.739	0.739
1998	0.110	0.335	0.615	0.756	0.796	0.806	0.808	0.809	0.809	0.809
1999	0.123	0.374	0.687	0.844	0.890	0.901	0.904	0.904	0.904	0.904
2000	0.077	0.233	0.428	0.526	0.554	0.561	0.562	0.563	0.563	0.563
2001	0.071	0.217	0.398	0.490	0.516	0.523	0.524	0.524	0.524	0.524

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.068	0.205	0.376	0.463	0.488	0.494	0.495	0.495	0.496	0.496
2003	0.083	0.252	0.463	0.569	0.600	0.607	0.609	0.609	0.610	0.610
2004	0.146	0.443	0.812	0.999	1.053	1.066	1.069	1.070	1.070	1.070
2005	0.152	0.462	0.849	1.043	1.100	1.113	1.116	1.117	1.117	1.117
2006	0.187	0.569	1.045	1.285	1.354	1.371	1.375	1.375	1.376	1.376
2007	0.159	0.483	0.886	1.090	1.149	1.163	1.166	1.167	1.167	1.167
2008	0.139	0.422	0.774	0.952	1.004	1.016	1.019	1.019	1.019	1.019
2009	0.244	0.740	1.358	1.670	1.760	1.781	1.786	1.787	1.788	1.788
2010	0.385	1.168	2.144	2.637	2.779	2.813	2.821	2.823	2.823	2.823
2011	0.227	0.691	1.268	1.560	1.644	1.664	1.669	1.670	1.670	1.670
2012	0.225	0.682	1.252	1.540	1.623	1.643	1.648	1.649	1.649	1.649
2013	0.190	0.577	1.059	1.303	1.373	1.390	1.394	1.394	1.395	1.395
2014	0.167	0.508	0.932	1.146	1.208	1.223	1.226	1.227	1.227	1.227
2015	0.156	0.473	0.867	1.067	1.124	1.138	1.141	1.142	1.142	1.142
2016	0.133	0.405	0.743	0.913	0.962	0.974	0.977	0.977	0.978	0.978
2017	0.125	0.380	0.697	0.857	0.903	0.914	0.917	0.917	0.918	0.918
2018	0.117	0.354	0.651	0.800	0.843	0.854	0.856	0.857	0.857	0.857
2019	0.110	0.334	0.613	0.754	0.795	0.805	0.807	0.807	0.807	0.807
2020	0.157	0.476	0.873	1.073	1.131	1.145	1.148	1.149	1.149	1.149
2021	0.130	0.396	0.727	0.894	0.942	0.954	0.956	0.957	0.957	0.957
2022	0.021	0.064	0.118	0.145	0.153	0.155	0.155	0.155	0.155	0.155