

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	351587.242	68162.921	240441.243	514111.420
NAA σ (age 1)	1.063	0.111	0.866	1.305
NAA σ (age 2-10+)	0.206	0.039	0.142	0.297
NAA residual AR1 ρ age	-0.102	0.164	-0.404	0.219
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: Selectivity for age 1	0.142	0.014	0.117	0.171
Block 1: Selectivity for age 2	0.454	0.035	0.386	0.523
Block 1: Selectivity for age 3	0.782	0.047	0.677	0.860
Block 1: Selectivity for age 4	1.000	—	—	—
Block 1: Selectivity for age 5	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	—	—	—

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 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	—	—	—
Block 3: Selectivity for age 3	1.000	—	—	—
Block 3: Selectivity for age 4	0.523	0.159	0.239	0.792
Block 3: Selectivity for age 5	0.291	0.116	0.120	0.552
Block 3: Selectivity for age 6	0.279	0.112	0.115	0.535
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	0.737	0.118	0.460	0.902
Block 4: Selectivity for age 5	0.605	0.118	0.369	0.801
Block 4: Selectivity for age 6	0.493	0.106	0.298	0.690

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 7	0.654	0.143	0.354	0.867
Block 4: Selectivity for age 8	0.656	0.140	0.360	0.866
Block 4: Selectivity for age 9	1.000	0.001	0.000	1.000
Block 4: Selectivity for age 10+	0.782	0.198	0.270	0.972
Fleet 1 age comp, logistic-normal: σ	37.103	3.412	30.984	44.431
Fleet 1 age comp, logistic-normal: ρ	0.906	0.019	0.862	0.937
Index 2 age comp, logistic-normal: σ	38.307	6.188	27.911	52.576
Index 2 age comp, logistic-normal: ρ	0.594	0.156	0.292	0.839
Index 3 age comp, logistic-normal: σ	36.919	3.404	30.816	44.231
Index 3 age comp, logistic-normal: ρ	0.688	0.066	0.548	0.801

Table 2. Abundance at age (1000s).

	1	2	3	4	5	6	7	8	9	10+
1968	7412337	1347576	475087	123277	64109	54526	22940	24434	111708	1184
1969	829846	5313207	1153039	343122	71160	42528	33482	20010	15749	73596
1970	3003921	706769	3793838	894642	211017	48017	28023	24827	15268	57126
1971	1116603	2053564	701074	2402508	592867	130911	30763	18801	16665	45738
1972	806319	839601	1308360	617425	1349321	312728	79097	15942	12726	34199
1973	825488	657072	571702	734272	475214	721159	165551	43234	9828	24725
1974	987215	580862	458712	283856	373557	274134	324379	80980	20648	16034
1975	1227763	786933	313372	245868	123450	178709	132171	135784	36463	15491
1976	172190	849890	456771	143364	93598	47704	70637	54208	49739	20321
1977	61864	134721	364696	163193	43987	28014	14279	22200	15975	21808
1978	42872	44199	94274	200385	85010	26593	15070	6950	13067	21489
1979	120412	43891	24078	68468	140459	58266	19540	10515	5003	25255
1980	33754	101357	28809	17474	46143	96679	36615	12693	7761	19514
1981	154220	25765	77154	16938	13738	32348	66323	25788	8597	19417
1982	418726	105457	16911	61697	8868	10269	21119	43147	17190	18265
1983	1643118	315165	69139	11691	42031	5833	5646	16826	26965	23852
1984	49717	1296111	246211	39327	7835	27928	4196	3658	10571	36244
1985	335232	38310	1034377	172533	23523	5177	23056	2937	2510	32104
1986	122451	201733	39028	696449	114571	14339	3237	17713	1705	22182
1987	120879	102408	108672	32703	491626	67949	9666	2058	12334	14651
1988	437652	94808	66283	55689	21937	294443	37112	5098	1343	16211
1989	478952	324437	62232	37058	29365	9416	184631	15781	2675	9464
1990	162216	390158	225126	33368	20434	16547	4488	110800	7573	6249
1991	141326	119773	273382	112905	14750	9429	7284	2269	48444	6124
1992	148447	122441	66462	161917	60241	7619	4476	3598	1311	26039
1993	59152	115282	89849	39065	98540	32553	4750	2168	2310	14617
1994	178254	34968	93821	63146	20043	59822	17365	2762	1123	8653
1995	189763	128668	18387	59649	37426	9708	30630	9040	1365	4405
1996	160618	136267	86739	9147	36596	23406	5273	15887	5168	2846
1997	214448	118615	77890	36165	3918	15295	10590	2060	6466	3301
1998	85165	165047	67658	35923	11623	1584	6134	4144	764	3336

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

	1	2	3	4	5	6	7	8	9	10+
1999	128781	66840	90392	30295	13247	3977	561	2420	1468	1422
2000	739334	96686	38004	36716	10396	4388	1240	202	842	847
2001	191620	588816	66101	20179	18039	4790	1916	509	118	707
2002	210814	140031	528015	35005	10441	8773	2643	823	235	392
2003	376239	148295	93386	327028	19317	5040	4097	1340	343	315
2004	729118	305952	74302	46603	164834	8565	2321	1435	643	287
2005	232704	547972	152700	24895	12740	52063	2351	705	291	264
2006	512700	158433	321987	51944	6551	3568	15441	643	165	141
2007	108219	346029	77630	98760	10859	1303	768	3515	129	59
2008	227737	74027	184234	25518	29397	2699	332	195	992	49
2009	194204	156937	36046	72356	7229	10037	738	94	50	342
2010	50595	119765	55143	7085	11089	995	1558	124	9	62
2011	146155	24260	28234	4874	376	581	50	78	6	4
2012	79914	102102	7896	6813	700	64	84	8	11	2
2013	57942	55416	42220	1689	1360	103	11	14	1	2
2014	91569	36374	26938	11938	434	279	18	3	3	1
2015	134968	57340	16246	9361	2627	153	49	5	1	1
2016	311503	91429	23745	5245	2525	714	40	12	1	0
2017	30848	234094	44808	8960	1594	843	201	12	4	0
2018	125566	20996	128347	18291	3385	489	297	61	4	1
2019	71904	80455	13846	49085	6001	1349	165	97	20	2
2020	94010	49183	44901	6454	17016	2219	595	50	36	8
2021	98658	64813	23819	13991	1783	4254	594	155	14	12
2022	297169	73458	32956	9516	4655	443	1692	193	51	8

Table 3. Total fishing mortality at age.

	1	2	3	4	5	6	7	8	9	10+
1968	0.024	0.077	0.133	0.170	0.170	0.170	0.170	0.170	0.170	0.170
1969	0.021	0.067	0.115	0.147	0.147	0.147	0.147	0.147	0.147	0.147
1970	0.030	0.095	0.163	0.209	0.209	0.209	0.209	0.209	0.209	0.209

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

	1	2	3	4	5	6	7	8	9	10+
1971	0.045	0.145	0.251	0.320	0.320	0.320	0.320	0.320	0.320	0.320
1972	0.049	0.157	0.271	0.347	0.347	0.347	0.347	0.347	0.347	0.347
1973	0.073	0.232	0.400	0.511	0.511	0.511	0.511	0.511	0.511	0.511
1974	0.086	0.274	0.473	0.604	0.604	0.604	0.604	0.604	0.604	0.604
1975	0.107	0.343	0.591	0.756	0.756	0.756	0.756	0.756	0.756	0.756
1976	0.142	0.453	0.780	0.997	0.997	0.997	0.997	0.997	0.997	0.997
1977	0.058	0.185	0.319	0.408	0.408	0.408	0.408	0.408	0.408	0.408
1978	0.021	0.067	0.116	0.148	0.148	0.148	0.148	0.148	0.148	0.148
1979	0.028	0.089	0.154	0.197	0.197	0.197	0.197	0.197	0.197	0.197
1980	0.024	0.076	0.132	0.168	0.168	0.168	0.168	0.168	0.168	0.168
1981	0.032	0.101	0.174	0.223	0.223	0.223	0.223	0.223	0.223	0.223
1982	0.030	0.097	0.167	0.214	0.214	0.214	0.214	0.214	0.214	0.214
1983	0.030	0.095	0.163	0.209	0.209	0.209	0.209	0.209	0.209	0.209
1984	0.023	0.072	0.124	0.159	0.159	0.159	0.159	0.159	0.159	0.159
1985	0.032	0.101	0.174	0.222	0.222	0.222	0.222	0.222	0.222	0.222
1986	0.031	0.098	0.170	0.217	0.217	0.217	0.217	0.217	0.217	0.217
1987	0.046	0.147	0.253	0.324	0.324	0.324	0.324	0.324	0.324	0.324
1988	0.064	0.206	0.354	0.453	0.453	0.453	0.453	0.453	0.453	0.453
1989	0.061	0.194	0.334	0.427	0.427	0.427	0.427	0.427	0.427	0.427
1990	0.081	0.260	0.448	0.573	0.573	0.573	0.573	0.573	0.573	0.573
1991	0.065	0.207	0.357	0.456	0.456	0.456	0.456	0.456	0.456	0.456
1992	0.048	0.155	0.267	0.341	0.341	0.341	0.341	0.341	0.341	0.341
1993	0.051	0.164	0.283	0.361	0.361	0.361	0.361	0.361	0.361	0.361
1994	0.064	0.206	0.355	0.454	0.454	0.454	0.454	0.454	0.454	0.454
1995	0.053	0.168	0.289	0.370	0.370	0.370	0.370	0.370	0.370	0.370
1996	0.092	0.295	0.508	0.649	0.649	0.649	0.649	0.649	0.649	0.649
1997	0.106	0.338	0.583	0.745	0.745	0.745	0.745	0.745	0.745	0.745
1998	0.111	0.354	0.609	0.779	0.779	0.779	0.779	0.779	0.779	0.779
1999	0.122	0.389	0.670	0.857	0.857	0.857	0.857	0.857	0.857	0.857
2000	0.074	0.235	0.405	0.518	0.518	0.518	0.518	0.518	0.518	0.518
2001	0.068	0.216	0.372	0.476	0.476	0.476	0.476	0.476	0.476	0.476

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

	1	2	3	4	5	6	7	8	9	10+
2002	0.069	0.221	0.382	0.488	0.488	0.488	0.488	0.488	0.488	0.488
2003	0.086	0.273	0.471	0.603	0.603	0.603	0.603	0.603	0.603	0.603
2004	0.153	0.491	0.845	1.081	1.081	1.081	1.081	1.081	1.081	1.081
2005	0.155	0.495	0.853	1.091	1.091	1.091	1.091	1.091	1.091	1.091
2006	0.190	0.607	1.046	1.338	1.338	1.338	1.338	1.338	1.338	1.338
2007	0.157	0.501	0.863	1.103	1.103	1.103	1.103	1.103	1.103	1.103
2008	0.142	0.454	0.783	1.001	1.001	1.001	1.001	1.001	1.001	1.001
2009	0.248	0.792	1.364	1.744	1.744	1.744	1.744	1.744	1.744	1.744
2010	0.392	1.254	2.161	2.763	2.763	2.763	2.763	2.763	2.763	2.763
2011	0.235	0.752	1.295	1.657	1.657	1.657	1.657	1.657	1.657	1.657
2012	0.219	0.700	1.206	1.542	1.542	1.542	1.542	1.542	1.542	1.542
2013	0.187	0.597	1.029	1.315	1.315	1.315	1.315	1.315	1.315	1.315
2014	0.170	0.543	0.936	1.197	1.197	1.197	1.197	1.197	1.197	1.197
2015	0.160	0.510	0.879	1.124	1.124	1.124	1.124	1.124	1.124	1.124
2016	0.135	0.432	0.745	0.952	0.952	0.952	0.952	0.952	0.952	0.952
2017	0.123	0.393	0.678	0.867	0.867	0.867	0.867	0.867	0.867	0.867
2018	0.119	0.380	0.654	0.837	0.837	0.837	0.837	0.837	0.837	0.837
2019	0.110	0.350	0.603	0.772	0.772	0.772	0.772	0.772	0.772	0.772
2020	0.158	0.505	0.869	1.112	1.112	1.112	1.112	1.112	1.112	1.112
2021	0.127	0.408	0.702	0.898	0.898	0.898	0.898	0.898	0.898	0.898
2022	0.021	0.066	0.114	0.145	0.145	0.145	0.145	0.145	0.145	0.145