WHAM figures and tables

WHAM Tables

Estimate Std. Error 95\\% CI lower 95\\% CI upper

stock 1 Mean Recruitment 2.681179e+06 6.916776e+05 1.617100e+06 4.445439e+06 stock 1 NAA
sigma (age 1) 8.230928e-01 1.270539e-01 6.082135e-01 1.113888e+00 stock 1 NAA
sigma (ages 2-8+) 2.574103e-01 4.400178e-02 1.841286e-01 3.598575e-01 stock 1 NAA AR1
rho age 8.369446e-01 6.095035e-02 6.707194e-01 9.231186e-01 Shrimp fully selected q 1.266827e-05 2.053640e-06 9.219978e-06 1.740623e-05 Acoust fully selected q 3.451755e-05 6.176230e-06 2.430716e-05 4.901687e-05
Estimate Std. Error 95\% CI lower 95\% CI upper stock 1 Mean Recruitment 2681178.897 691677.620 1617100.150 4445439.127 stock 1 NAA
sigma (age 1) 0.823 0.127 0.608 1.114 stock 1 NAA
sigma (ages 2-8+) 0.257 0.044 0.184 0.360 stock 1 NAA AR1
rho age 0.837 0.061 0.671 0.923 Shrimp fully selected q 1.267
$times 10^{-5}$ 2.054
$times 10^{-6}$ 9.220
$times 10^{-6}$ 1.741
$times 10^{-5}$ Acoust fully selected q 3.452
$times 10^{-5}$ 6.176
$times 10^{-6}$ 2.431
$times 10^{-5}$ 4.902
$times 10^{-5}$

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

	Estimate	Std. Error	95% CI lower	95% CI upper
stock 1 Mean Recruitment	2681178.897	691677.620	1617100.150	4445439.127
stock 1 NAA σ (age 1)	0.823	0.127	0.608	1.114
stock 1 NAA σ (ages 2-8+)	0.257	0.044	0.184	0.360
stock 1 NAA AR1 ρ age	0.837	0.061	0.671	0.923
Shrimp fully selected q	1.267×10^{-5}	2.054×10^{-6}	9.220×10^{-6}	1.741×10^{-5}
Acoust fully selected q	3.452×10^{-5}	6.176×10^{-6}	2.431×10^{-5}	4.902×10^{-5}
SprAlb85 fully selected q	7.685×10^{-6}	1.217×10^{-6}	5.634×10^{-6}	1.048×10^{-5}
FallAlb85 fully selected q	1.196×10^{-5}	2.261×10^{-6}	8.260×10^{-6}	1.733×10^{-5}
SprBig fully selected q	4.448×10^{-5}	7.868×10^{-6}	3.145×10^{-5}	6.291×10^{-5}
FallBig fully selected q	7.393×10^{-5}	1.986×10^{-5}	4.367×10^{-5}	1.252×10^{-4}
Mobile Selectivity for age 1 (Block 1)	3.542×10^{-4}	9.070×10^{-5}	2.144×10^{-4}	5.851×10^{-4}
Mobile Selectivity for age 2 (Block 1)	0.089	0.016	0.062	0.127
Mobile Selectivity for age 3 (Block 1)	0.342	0.056	0.242	0.459
Mobile Selectivity for age 4 (Block 1)	0.447	0.066	0.324	0.576
Mobile Selectivity for age 5 (Block 1)	0.540	0.067	0.408	0.666
Mobile Selectivity for age 6 (Block 1)	0.718	0.067	0.571	0.830
Mobile Selectivity for age 7 (Block 1)	1.000	–	–	–
Mobile Selectivity for age 8+ (Block 1)	1.000	–	–	–
Fixed Selectivity for age 1 (Block 2)	0.038	0.007	0.027	0.053
Fixed Selectivity for age 2 (Block 2)	1.000	–	–	–
Fixed Selectivity for age 3 (Block 2)	0.238	0.038	0.171	0.321
Fixed Selectivity for age 4 (Block 2)	0.103	0.024	0.065	0.160

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

	Estimate	Std. Error	95% CI lower	95% CI upper
Fixed Selectivity for age 5 (Block 2)	0.069	0.019	0.040	0.117
Fixed Selectivity for age 6 (Block 2)	0.062	0.019	0.034	0.112
Fixed Selectivity for age 7 (Block 2)	0.059	0.020	0.030	0.112
Fixed Selectivity for age 8+ (Block 2)	0.041	0.013	0.021	0.076
Shrimp Selectivity for age 1 (Block 3)	0.000	–	–	–
Shrimp Selectivity for age 2 (Block 3)	0.000	–	–	–
Shrimp Selectivity for age 3 (Block 3)	0.058	0.026	0.024	0.134
Shrimp Selectivity for age 4 (Block 3)	1.000	–	–	–
Shrimp Selectivity for age 5 (Block 3)	1.000	–	–	–
Shrimp Selectivity for age 6 (Block 3)	1.000	–	–	–
Shrimp Selectivity for age 7 (Block 3)	1.000	–	–	–
Shrimp Selectivity for age 8+ (Block 3)	1.000	–	–	–
Acoust Selectivity for age 1 (Block 4)	0.000	–	–	–
Acoust Selectivity for age 2 (Block 4)	0.000	–	–	–
Acoust Selectivity for age 3 (Block 4)	1.000	–	–	–
Acoust Selectivity for age 4 (Block 4)	1.000	–	–	–
Acoust Selectivity for age 5 (Block 4)	1.000	–	–	–
Acoust Selectivity for age 6 (Block 4)	1.000	–	–	–
Acoust Selectivity for age 7 (Block 4)	1.000	–	–	–
Acoust Selectivity for age 8+ (Block 4)	1.000	–	–	–
SprAlb85 Selectivity for age 1 (Block 5)	0.000	–	–	–
SprAlb85 Selectivity for age 2 (Block 5)	0.344	0.051	0.252	0.450

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

	Estimate	Std. Error	95% CI lower	95% CI upper
SprAlb85 Selectivity for age 3 (Block 5)	1.000	–	–	–
SprAlb85 Selectivity for age 4 (Block 5)	1.000	–	–	–
SprAlb85 Selectivity for age 5 (Block 5)	1.000	–	–	–
SprAlb85 Selectivity for age 6 (Block 5)	1.000	–	–	–
SprAlb85 Selectivity for age 7 (Block 5)	1.000	–	–	–
SprAlb85 Selectivity for age 8+ (Block 5)	1.000	–	–	–
FallAlb85 a_{50} (Block 6)	2.737	0.141	2.468	3.020
FallAlb85 1/slope (increasing) (Block 6)	0.353	0.042	0.279	0.446
SprBig Selectivity for age 1 (Block 7)	0.000	–	–	–
SprBig Selectivity for age 2 (Block 7)	0.138	0.034	0.085	0.218
SprBig Selectivity for age 3 (Block 7)	0.591	0.100	0.391	0.765
SprBig Selectivity for age 4 (Block 7)	1.000	–	–	–
SprBig Selectivity for age 5 (Block 7)	1.000	–	–	–
SprBig Selectivity for age 6 (Block 7)	1.000	–	–	–
SprBig Selectivity for age 7 (Block 7)	1.000	–	–	–
SprBig Selectivity for age 8+ (Block 7)	1.000	–	–	–
FallBig a_{50} (Block 8)	3.821	0.293	3.254	4.396
FallBig 1/slope (increasing) (Block 8)	0.475	0.062	0.368	0.612
Mobile age comp, logistic-normal: σ	12.095	1.338	9.737	15.023
Mobile age comp, logistic-normal: ρ	0.823	0.041	0.729	0.889
Fixed age comp, logistic-normal: σ	25.828	2.442	21.460	31.086
Fixed age comp, logistic-normal: ρ	0.819	0.036	0.739	0.879

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

	Estimate	Std. Error	95% CI lower	95% CI upper
Shrimp age comp, logistic-normal: σ	22.897	5.918	13.796	38.002
Shrimp age comp, logistic-normal: ρ	0.809	0.107	0.520	0.943
SprAlb85 age comp, logistic-normal: σ	23.201	3.163	17.761	30.308
SprAlb85 age comp, logistic-normal: ρ	0.884	0.034	0.798	0.936
FallAlb85 age comp, logistic-normal: σ	23.193	3.341	17.489	30.759
FallAlb85 age comp, logistic-normal: ρ	0.936	0.020	0.883	0.966
SprBig age comp, logistic-normal: σ	15.528	2.749	10.975	21.968
SprBig age comp, logistic-normal: ρ	0.754	0.093	0.533	0.892
FallBig age comp, logistic-normal: σ	22.041	3.721	15.831	30.686
FallBig age comp, logistic-normal: ρ	0.849	0.055	0.708	0.929
Ecov Haddock Predation on Eggs: RW Ecov_1	14.557	0.218	14.130	14.985
Ecov Haddock Predation on Eggs: RW σ	0.516	0.102	0.350	0.761
Ecov: Haddock Predation on Eggs obs. sd.	0.233	0.114	0.090	0.606

Abundance at age

Table 2. Abundance at age (1000s) for stock 1 in region 1.

	1	2	3	4	5	6	7	8+
1987	1698959	1137455	557375	648139	106105	50450	11419	5204
1988	3147423	1894972	679532	509570	583936	93862	31284	7388
1989	2629920	2241611	645784	340536	257967	330437	56451	20256
1990	2764029	2120471	859452	406762	199733	147265	197202	42200
1991	3071104	3141690	1344685	750086	281337	116463	80908	131511
1992	2310956	3237565	2549230	1016066	471966	161070	62502	102661
1993	2101361	1678394	1427355	1051823	485520	179260	58017	52893
1994	1982678	1887823	805360	918714	718148	349482	110046	55958
1995	10624935	2218934	1484692	951841	1258058	868065	351702	133045
1996	6173281	9377875	1566108	1024965	650501	751484	400229	180326
1997	3565332	3040068	4362644	717519	413006	277373	222681	137753
1998	1333614	2326823	1264928	1979420	412358	206119	131660	127049
1999	4422971	1218188	1498925	879218	1164196	265546	105905	95587
2000	2088577	4466077	745578	801792	564198	535076	115499	65661
2001	1700584	1518986	3162450	548750	559442	431397	320932	87715
2002	7910880	1590459	993871	2389207	536267	395554	228947	152252
2003	4881029	3150011	685657	487631	1137640	333344	199930	152621
2004	4278083	4879158	2975639	743789	471739	707490	211659	149718
2005	902166	1161270	1111147	875179	293997	188163	204071	89973
2006	4530363	1029036	1182745	1133746	701251	205882	101726	107434
2007	1229093	3371619	676337	625654	623473	384857	100128	76740
2008	2576652	593257	1281687	294826	223119	239681	152820	66862
2009	18046495	3904997	887843	967444	173875	120016	100153	67316
2010	2760271	17104477	2738282	455068	416459	68653	40074	38575
2011	2552853	1170999	4575947	739858	129154	94042	16572	16267
2012	8271442	1436184	623197	2026152	305257	55983	31438	9452
2013	3155868	7203879	1047776	428391	1018664	133716	21987	10433
2014	3500853	1274511	2997130	432224	228246	494015	60579	11690
2015	1015959	1405938	447925	1226708	220595	151424	282590	34851
2016	404131	570453	753697	285279	617827	123519	83568	148224

Table 2. Abundance at age (1000s) for stock 1 in region 1. *(continued)*

	1	2	3	4	5	6	7	8+
2017	1895305	265786	364630	393432	172097	303018	57793	92850
2018	620552	873947	92479	92378	96660	52166	86101	43388
2019	6263655	722037	694556	53241	51046	47828	21973	31905
2020	2400461	1888343	229480	168556	11539	12871	12293	12792
2021	1350109	1034388	675883	83486	46436	3814	3551	5616
2022	1622847	791470	536357	320924	49890	27223	2119	4537
2023	2555845	1159259	553255	264874	153779	26005	13188	3037

Fishing mortality at age by region

Table 3. Total fishing mortality at age in region 1.

	1	2	3	4	5	6	7	8+
1987	0.025	0.739	0.482	0.493	0.560	0.725	0.992	0.979
1988	0.028	0.792	0.378	0.339	0.369	0.469	0.632	0.619
1989	0.031	0.870	0.424	0.386	0.421	0.536	0.724	0.709
1990	0.024	0.676	0.325	0.293	0.319	0.406	0.548	0.536
1991	0.010	0.310	0.288	0.324	0.377	0.494	0.682	0.677
1992	0.010	0.303	0.244	0.265	0.306	0.399	0.549	0.544
1993	0.017	0.482	0.287	0.285	0.320	0.413	0.563	0.555
1994	0.013	0.380	0.229	0.228	0.257	0.332	0.453	0.446
1995	0.005	0.162	0.158	0.179	0.209	0.274	0.379	0.376
1996	0.002	0.079	0.148	0.184	0.220	0.292	0.405	0.404
1997	0.004	0.151	0.206	0.247	0.292	0.386	0.534	0.533
1998	0.009	0.296	0.264	0.294	0.342	0.448	0.617	0.613
1999	0.009	0.292	0.286	0.325	0.380	0.498	0.687	0.683
2000	0.003	0.125	0.230	0.286	0.341	0.452	0.627	0.626
2001	0.007	0.224	0.224	0.256	0.300	0.393	0.543	0.539
2002	0.004	0.144	0.156	0.180	0.212	0.279	0.385	0.383
2003	0.003	0.114	0.202	0.250	0.298	0.395	0.548	0.547
2004	0.004	0.135	0.147	0.170	0.200	0.263	0.363	0.361
2005	0.009	0.297	0.316	0.365	0.429	0.564	0.779	0.775

Table 3. Total fishing mortality at age in region 1. *(continued)*

	1	2	3	4	5	6	7	8+
2006	0.007	0.233	0.263	0.307	0.361	0.476	0.658	0.654
2007	0.008	0.272	0.252	0.283	0.330	0.432	0.596	0.592
2008	0.006	0.238	0.326	0.391	0.464	0.612	0.848	0.845
2009	0.001	0.102	0.313	0.403	0.486	0.646	0.899	0.899
2010	0.001	0.060	0.148	0.189	0.227	0.301	0.418	0.418
2011	0.002	0.104	0.239	0.303	0.364	0.482	0.671	0.670
2012	0.001	0.084	0.301	0.392	0.473	0.629	0.876	0.876
2013	0.001	0.089	0.279	0.361	0.435	0.579	0.805	0.805
2014	0.001	0.074	0.211	0.271	0.326	0.434	0.603	0.603
2015	0.001	0.072	0.231	0.299	0.360	0.479	0.666	0.666
2016	0.005	0.181	0.251	0.303	0.359	0.474	0.656	0.654
2017	0.004	0.153	0.214	0.258	0.306	0.403	0.559	0.557
2018	0.015	0.535	0.686	0.816	0.965	1.273	1.762	1.755
2019	0.010	0.294	0.207	0.217	0.248	0.322	0.441	0.436
2020	0.003	0.106	0.150	0.180	0.214	0.283	0.392	0.390
2021	0.005	0.157	0.110	0.116	0.132	0.172	0.235	0.233
2022	0.003	0.087	0.056	0.057	0.064	0.083	0.114	0.113
2023	0.001	0.037	0.081	0.102	0.123	0.163	0.226	0.226

Fishing mortality at age by fleet

Table 4. Total fishing mortality at age in Mobile.

	1	2	3	4	5	6	7	8+
1987	0.000	0.085	0.326	0.426	0.514	0.684	0.953	0.953
1988	0.000	0.052	0.201	0.263	0.318	0.423	0.589	0.589
1989	0.000	0.060	0.231	0.302	0.365	0.486	0.676	0.676
1990	0.000	0.045	0.175	0.228	0.275	0.366	0.510	0.510
1991	0.000	0.059	0.228	0.298	0.360	0.479	0.667	0.667
1992	0.000	0.048	0.183	0.238	0.288	0.383	0.534	0.534
1993	0.000	0.048	0.184	0.240	0.290	0.386	0.538	0.538
1994	0.000	0.039	0.148	0.193	0.233	0.310	0.432	0.432

Table 4. Total fishing mortality at age in Mobile. *(continued)*

	1	2	3	4	5	6	7	8+
1995	0.000	0.033	0.127	0.166	0.200	0.266	0.371	0.371
1996	0.000	0.036	0.138	0.180	0.217	0.289	0.402	0.402
1997	0.000	0.047	0.181	0.236	0.285	0.379	0.528	0.528
1998	0.000	0.054	0.206	0.269	0.325	0.433	0.603	0.603
1999	0.000	0.060	0.231	0.301	0.364	0.484	0.673	0.673
2000	0.000	0.056	0.213	0.278	0.336	0.447	0.623	0.623
2001	0.000	0.047	0.182	0.238	0.287	0.382	0.532	0.532
2002	0.000	0.034	0.130	0.169	0.204	0.272	0.379	0.379
2003	0.000	0.049	0.186	0.243	0.294	0.391	0.544	0.544
2004	0.000	0.032	0.122	0.160	0.193	0.256	0.357	0.357
2005	0.000	0.068	0.262	0.342	0.413	0.550	0.765	0.765
2006	0.000	0.058	0.221	0.289	0.349	0.465	0.647	0.647
2007	0.000	0.052	0.199	0.260	0.315	0.418	0.583	0.583
2008	0.000	0.075	0.287	0.374	0.452	0.602	0.838	0.838
2009	0.000	0.080	0.307	0.401	0.485	0.645	0.898	0.898
2010	0.000	0.037	0.143	0.186	0.225	0.299	0.417	0.417
2011	0.000	0.060	0.229	0.298	0.361	0.480	0.668	0.668
2012	0.000	0.078	0.300	0.391	0.473	0.629	0.876	0.876
2013	0.000	0.072	0.275	0.359	0.434	0.577	0.804	0.804
2014	0.000	0.054	0.206	0.269	0.325	0.432	0.602	0.602
2015	0.000	0.059	0.228	0.297	0.359	0.478	0.666	0.666
2016	0.000	0.058	0.222	0.290	0.350	0.466	0.649	0.649
2017	0.000	0.049	0.189	0.247	0.298	0.397	0.553	0.553
2018	0.001	0.155	0.595	0.777	0.939	1.249	1.739	1.739
2019	0.000	0.038	0.146	0.190	0.230	0.306	0.426	0.426
2020	0.000	0.035	0.133	0.173	0.209	0.278	0.388	0.388
2021	0.000	0.020	0.078	0.101	0.123	0.163	0.227	0.227
2022	0.000	0.010	0.037	0.049	0.059	0.079	0.109	0.109
2023	0.000	0.020	0.077	0.101	0.122	0.162	0.225	0.225

Table 5. Total fishing mortality at age in Fixed.

	1	2	3	4	5	6	7	8+
1987	0.025	0.654	0.156	0.067	0.045	0.041	0.039	0.027
1988	0.028	0.740	0.176	0.076	0.051	0.046	0.044	0.030
1989	0.031	0.810	0.193	0.084	0.056	0.050	0.048	0.033
1990	0.024	0.631	0.150	0.065	0.044	0.039	0.037	0.026
1991	0.009	0.250	0.060	0.026	0.017	0.016	0.015	0.010
1992	0.010	0.256	0.061	0.026	0.018	0.016	0.015	0.010
1993	0.016	0.434	0.103	0.045	0.030	0.027	0.026	0.018
1994	0.013	0.342	0.081	0.035	0.024	0.021	0.020	0.014
1995	0.005	0.129	0.031	0.013	0.009	0.008	0.008	0.005
1996	0.002	0.043	0.010	0.004	0.003	0.003	0.003	0.002
1997	0.004	0.104	0.025	0.011	0.007	0.006	0.006	0.004
1998	0.009	0.242	0.058	0.025	0.017	0.015	0.014	0.010
1999	0.009	0.232	0.055	0.024	0.016	0.014	0.014	0.009
2000	0.003	0.070	0.017	0.007	0.005	0.004	0.004	0.003
2001	0.007	0.177	0.042	0.018	0.012	0.011	0.010	0.007
2002	0.004	0.110	0.026	0.011	0.008	0.007	0.007	0.004
2003	0.002	0.065	0.016	0.007	0.005	0.004	0.004	0.003
2004	0.004	0.103	0.025	0.011	0.007	0.006	0.006	0.004
2005	0.009	0.228	0.054	0.024	0.016	0.014	0.014	0.009
2006	0.007	0.175	0.042	0.018	0.012	0.011	0.010	0.007
2007	0.008	0.220	0.052	0.023	0.015	0.014	0.013	0.009
2008	0.006	0.163	0.039	0.017	0.011	0.010	0.010	0.007
2009	0.001	0.022	0.005	0.002	0.002	0.001	0.001	0.001
2010	0.001	0.022	0.005	0.002	0.002	0.001	0.001	0.001
2011	0.002	0.044	0.011	0.005	0.003	0.003	0.003	0.002
2012	0.000	0.006	0.001	0.001	0.000	0.000	0.000	0.000
2013	0.001	0.018	0.004	0.002	0.001	0.001	0.001	0.001
2014	0.001	0.021	0.005	0.002	0.001	0.001	0.001	0.001
2015	0.000	0.013	0.003	0.001	0.001	0.001	0.001	0.001
2016	0.005	0.123	0.029	0.013	0.009	0.008	0.007	0.005
2017	0.004	0.104	0.025	0.011	0.007	0.006	0.006	0.004

Table 5. Total fishing mortality at age in Fixed. *(continued)*

	1	2	3	4	5	6	7	8+
2018	0.014	0.380	0.091	0.039	0.026	0.024	0.023	0.015
2019	0.010	0.256	0.061	0.026	0.018	0.016	0.015	0.010
2020	0.003	0.071	0.017	0.007	0.005	0.004	0.004	0.003
2021	0.005	0.137	0.033	0.014	0.009	0.009	0.008	0.006
2022	0.003	0.077	0.018	0.008	0.005	0.005	0.005	0.003
2023	0.001	0.017	0.004	0.002	0.001	0.001	0.001	0.001