Annex 3

Decision Tables Requested by the AW

The SEDAR-16 Review Workshop (RW) considered that portraying the statistical uncertainty associated with the "base case" VPA models of king mackerel would not sufficiently capture the level of overall uncertainty in the assessment. Thus, the RW requested that decision tables be prepared for several candidate ABC values (possible decisions), showing the probability that MFMT be exceeded (possible consequences), under the base case and two alternative models (possible states of nature) for each migratory unit. While the RW discussed that the projections upon which these tables are based should not go many years into the future, SERO has requested other projection results to 2016 (see Annex 2). For the sake of easing comparisons, the decision tables herein are extended to 2016.

Table A3.1 shows the probability of overfishing by year for each constant catch projection (TAC: 6-14 million pounds for the Atlantic migratory unit; 8-18 million pounds for the Gulf migratory unit; see also worksheet “DecisionTables” in Attachment 1). For each stock unit, the probability of overfishing (Fyear > MFMT) was estimated as the number of bootstraps for which current fishing mortality (geometric mean for current and 2 prior years) was greater than $F_{30\%SPR}$ divided by the total number of bootstraps (1000 per stock unit). Projections of constant catch started in the 2008 fishing year (for 2007, Fcurrent was assumed, i.e. the same geometric mean fishing mortality estimated for 2004-2006). The columns represent three “states of nature" chosen by the review panel to represent the uncertainty in the stock assessment evaluation.

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Table A3.1. Probability of overfishing by year for each constant catch projection (TAC: 6-14 million pounds ATL; 8-18 million pounds GLF). The columns represent three "states of nature" chosen by the review panel to represent the structural uncertainty in the stock assessment.

Atlantic Stock Unit

Fyear	Cte Catch	Base Model	New Index	MLE Indices weighting
2008	6.0 mlbs	0.321	0	0
	7.0 mlbs	0.412	0.001	0
	8.0 mlbs	0.509	0.005	0
	8.5 mlbs	0.556	0.007	0
	9.0 mlbs	0.603	0.009	0
	9.5 mlbs	0.64	0.014	0
	10.0 mlbs	0.675	0.02	0
	10.5 mlbs	0.699	0.027	0.001
	11.0 mlbs	0.73	0.034	0.001
	11.5 mlbs	0.766	0.045	0.002
	12.0 mlbs	0.786	0.061	0.004
	12.5 mlbs	0.813	0.08	0.004
	13.0 mlbs	0.829	0.096	0.004
	14.0 mlbs	0.866	0.138	0.012
2009	6.0 mlbs	0.04	0	0
	7.0 mlbs	0.144	0	0
	8.0 mlbs	0.282	0.002	0
	8.5 mlbs	0.349	0.006	0
	9.0 mlbs	0.429	0.013	0.001
	9.5 mlbs	0.501	0.019	0.002
	10.0 mlbs	0.577	0.037	0.006
	10.5 mlbs	0.644	0.059	0.011
	11.0 mlbs	0.702	0.097	0.015
	11.5 mlbs	0.762	0.152	0.027
	12.0 mlbs	0.806	0.202	0.035
	12.5 mlbs	0.85	0.261	0.051
	13.0 mlbs	0.883	0.318	0.069
	14.0 mlbs	0.922	0.473	0.148
2010	6.0 mlbs	0.009	0	0
	7.0 mlbs	0.059	0	0
	8.0 mlbs	0.189	0.004	0
	8.5 mlbs	0.274	0.012	0.001
	9.0 mlbs	0.36	0.028	0.006
	9.5 mlbs	0.453	0.051	0.009
	10.0 mlbs	0.541	0.09	0.025
	10.5 mlbs	0.633	0.16	0.045
	11.0 mlbs	0.711	0.226	0.08
	11.5 mlbs	0.778	0.313	0.129
	12.0 mlbs	0.835	0.403	0.181
	12.5 mlbs	0.881	0.491	0.251
	13.0 mlbs	0.909	0.578	0.322
	14.0 mlbs	0.956	0.735	0.458
2011	6.0 mlbs	0.007	0	0
	7.0 mlbs	0.044	0	0
	8.0 mlbs	0.163	0.004	0

Gulf of Mexico Stock Unit

Fyear	Cte Catch	Base Model**	MLE Indices weighting	Fishery Dependent Indices Only
2008	8.0 mlbs	0.009	0.957	0.999
	9.0 mlbs	0.024	0.967	0.999
	9.5 mlbs	0.032	0.971	0.999
	10.0 mlbs	0.038	0.973	0.999
	10.5 mlbs	0.049	0.98	0.999
	11.0 mlbs	0.061	0.982	0.999
	11.5 mlbs	0.077	0.988	0.999
	12.0 mlbs	0.1	0.989	0.999
	12.5 mlbs	0.119	0.989	0.999
	13.0 mlbs	0.132	0.99	0.999
	13.5 mlbs	0.154	0.991	0.999
	14.0 mlbs	0.165	0.991	0.999
	15.0 mlbs	0.205	0.995	0.999
	16.0 mlbs	0.257	0.996	0.999
2009	8.0 mlbs	0	0.29	0.999
	9.0 mlbs	0	0.47	0.999
	9.5 mlbs	0.001	0.543	0.999
	10.0 mlbs	0.003	0.62	0.999
	10.5 mlbs	0.008	0.676	0.999
	11.0 mlbs	0.013	0.73	0.999
	11.5 mlbs	0.017	0.763	0.999
	12.0 mlbs	0.028	0.801	0.999
	12.5 mlbs	0.036	0.829	0.999
	13.0 mlbs	0.051	0.852	0.999
	13.5 mlbs	0.076	0.869	0.999
	14.0 mlbs	0.103	0.887	0.999
	15.0 mlbs	0.163	0.913	0.999
	16.0 mlbs	0.241	0.926	0.999
2010	8.0 mlbs	0	0.118	0.996
	9.0 mlbs	0	0.262	0.999
	9.5 mlbs	0	0.356	0.999
	10.0 mlbs	0.001	0.444	0.999
	10.5 mlbs	0.006	0.508	0.999
	11.0 mlbs	0.007	0.584	0.999
	11.5 mlbs	0.017	0.633	0.999
	12.0 mlbs	0.03	0.701	0.999
	12.5 mlbs	0.044	0.744	0.999
	13.0 mlbs	0.066	0.774	0.999
	13.5 mlbs	0.097	0.812	0.999
	14.0 mlbs	0.143	0.832	0.999
	15.0 mlbs	0.241	0.871	0.999
	16.0 mlbs	0.357	0.897	0.999
2011	8.0 mlbs	0	0.113	0.996
	9.0 mlbs	0	0.254	0.999
	9.5 mlbs	0	0.338	0.999

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Fyear	Cte Catch	Base Model	New Index	MLE Indices weighting
	8.5 mlbs	0.255	0.016	0.002
	9.0 mlbs	0.353	0.038	0.007
	9.5 mlbs	0.444	0.071	0.018
	10.0 mlbs	0.538	0.131	0.037
	10.5 mlbs	0.636	0.194	0.076
	11.0 mlbs	0.72	0.281	0.114
	11.5 mlbs	0.786	0.377	0.191
	12.0 mlbs	0.854	0.472	0.264
	12.5 mlbs	0.893	0.558	0.327
	13.0 mlbs	0.92	0.646	0.405
	14.0 mlbs	0.963	0.799	0.541
2012	6.0 mlbs	0.006	0	0
	7.0 mlbs	0.028	0	0
	8.0 mlbs	0.16	0.004	0.001
	8.5 mlbs	0.251	0.015	0.003
	9.0 mlbs	0.346	0.039	0.008
	9.5 mlbs	0.444	0.093	0.025
	10.0 mlbs	0.556	0.161	0.055
	10.5 mlbs	0.66	0.236	0.095
	11.0 mlbs	0.743	0.332	0.16
	11.5 mlbs	0.815	0.435	0.244
	12.0 mlbs	0.873	0.54	0.321
	12.5 mlbs	0.913	0.619	0.4
	13.0 mlbs	0.944	0.715	0.476
	14.0 mlbs	0.974	0.857	0.623
2013	6.0 mlbs	0.001	0	0
	7.0 mlbs	0.023	0	0
	8.0 mlbs	0.152	0.003	0.001
	8.5 mlbs	0.241	0.016	0.002
	9.0 mlbs	0.346	0.05	0.009
	9.5 mlbs	0.447	0.107	0.032
	10.0 mlbs	0.567	0.184	0.061
	10.5 mlbs	0.705	0.277	0.108
	11.0 mlbs	0.772	0.379	0.191
	11.5 mlbs	0.84	0.493	0.282
	12.0 mlbs	0.905	0.591	0.364
	12.5 mlbs	0.936	0.69	0.467
	13.0 mlbs	0.961	0.784	0.55
	14.0 mlbs	0.986	0.9	0.689
2014	6.0 mlbs	0.001	0	0
	7.0 mlbs	0.018	0	0
	8.0 mlbs	0.137	0.003	0.001
	8.5 mlbs	0.238	0.016	0.002
	9.0 mlbs	0.358	0.046	0.016
	9.5 mlbs	0.47	0.114	0.029
	10.0 mlbs	0.612	0.207	0.069
	10.5 mlbs	0.726	0.32	0.12
	11.0 mlbs	0.81	0.429	0.223
	11.5 mlbs	0.874	0.543	0.316
	12.0 mlbs	0.932	0.658	0.411
	12.5 mlbs	0.957	0.751	0.512
	13.0 mlbs	0.973	0.836	0.597

Fyear	Cte Catch	Base Model**	MLE Indices weighting	Fishery Dependent Indices Only
	10.0 mlbs	0.002	0.42	0.999
	10.5 mlbs	0.006	0.49	0.999
	11.0 mlbs	0.009	0.566	0.999
	11.5 mlbs	0.021	0.622	0.999
	12.0 mlbs	0.032	0.685	0.999
	12.5 mlbs	0.052	0.733	0.999
	13.0 mlbs	0.085	0.766	0.999
	13.5 mlbs	0.125	0.802	0.999
	14.0 mlbs	0.186	0.825	0.999
	15.0 mlbs	0.294	0.866	0.999
	16.0 mlbs	0.425	0.887	0.999
2012	8.0 mlbs	0	0.115	0.992
	9.0 mlbs	0	0.29	0.999
	9.5 mlbs	0.001	0.371	0.999
	10.0 mlbs	0.003	0.458	0.999
	10.5 mlbs	0.008	0.54	0.999
	11.0 mlbs	0.016	0.615	0.999
	11.5 mlbs	0.028	0.682	0.999
	12.0 mlbs	0.053	0.737	0.999
	12.5 mlbs	0.087	0.771	0.999
	13.0 mlbs	0.138	0.817	0.999
	13.5 mlbs	0.205	0.838	0.999
	14.0 mlbs	0.265	0.866	0.999
	15.0 mlbs	0.402	0.892	0.999
	16.0 mlbs	0.548	0.918	0.999
2013	8.0 mlbs	0	0.125	0.986
	9.0 mlbs	0.001	0.325	0.997
	9.5 mlbs	0.001	0.411	0.998
	10.0 mlbs	0.006	0.508	0.999
	10.5 mlbs	0.011	0.599	0.999
	11.0 mlbs	0.025	0.688	0.999
	11.5 mlbs	0.051	0.738	0.999
	12.0 mlbs	0.095	0.785	0.999
	12.5 mlbs	0.151	0.824	0.999
	13.0 mlbs	0.22	0.858	0.999
	13.5 mlbs	0.293	0.882	0.999
	14.0 mlbs	0.363	0.894	0.999
	15.0 mlbs	0.538	0.919	0.999
	16.0 mlbs	0.672	0.934	0.999
2014	8.0 mlbs	0	0.138	0.986
	9.0 mlbs	0.001	0.365	0.996
	9.5 mlbs	0.002	0.463	0.998
	10.0 mlbs	0.009	0.564	0.999
	10.5 mlbs	0.017	0.655	0.999
	11.0 mlbs	0.048	0.736	0.999
	11.5 mlbs	0.096	0.798	0.999
	12.0 mlbs	0.155	0.833	0.999
	12.5 mlbs	0.229	0.873	0.999
	13.0 mlbs	0.313	0.893	0.999
	13.5 mlbs	0.413	0.908	0.999
	14.0 mlbs	0.514	0.921	0.999
	15.0 mlbs	0.663	0.939	0.999

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Fyear	Cte Catch	Base Model	New Index	MLE Indices weighting
	14.0 mlbs	0.996	0.942	0.765
2015	6.0 mlbs	0.001	0	0
	7.0 mlbs	0.012	0	0
	8.0 mlbs	0.118	0.003	0.001
	8.5 mlbs	0.236	0.017	0.002
	9.0 mlbs	0.366	0.044	0.016
	9.5 mlbs	0.507	0.121	0.028
	10.0 mlbs	0.628	0.218	0.061
	10.5 mlbs	0.747	0.343	0.146
	11.0 mlbs	0.839	0.463	0.232
	11.5 mlbs	0.907	0.59	0.34
	12.0 mlbs	0.95	0.699	0.45
	12.5 mlbs	0.971	0.8	0.544
	13.0 mlbs	0.987	0.869	0.665
	14.0 mlbs	0.997	0.961	0.829
2016	6.0 mlbs	0.001	0	0
	7.0 mlbs	0.009	0	0
	8.0 mlbs	0.103	0.003	0.001
	8.5 mlbs	0.225	0.012	0.004
	9.0 mlbs	0.369	0.044	0.016
	9.5 mlbs	0.525	0.122	0.026
	10.0 mlbs	0.66	0.224	0.074
	10.5 mlbs	0.769	0.374	0.145
	11.0 mlbs	0.869	0.503	0.25
	11.5 mlbs	0.923	0.627	0.363
	12.0 mlbs	0.957	0.736	0.486
	12.5 mlbs	0.98	0.829	0.603
	13.0 mlbs	0.992	0.9	0.719
	14.0 mlbs	0.998	0.975	0.873

Fyear	Cte Catch	Base Model**	MLE Indices weighting	Fishery Dependent Indices Only
	16.0 mlbs	0.772	0.949	0.999
2015	8.0 mlbs	0	0.148	0.984
	9.0 mlbs	0.001	0.383	0.996
	9.5 mlbs	0.006	0.509	0.999
	10.0 mlbs	0.014	0.611	0.999
	10.5 mlbs	0.032	0.696	0.999
	11.0 mlbs	0.079	0.784	0.999
	11.5 mlbs	0.136	0.834	0.999
	12.0 mlbs	0.22	0.865	0.999
	12.5 mlbs	0.31	0.896	0.999
	13.0 mlbs	0.413	0.909	0.999
	13.5 mlbs	0.525	0.925	0.999
	14.0 mlbs	0.613	0.936	0.999
	15.0 mlbs	0.76	0.954	0.999
	16.0 mlbs	0.858	0.959	0.999
2016	8.0 mlbs	0	0.151	0.987
	9.0 mlbs	0.002	0.416	0.998
	9.5 mlbs	0.009	0.539	0.999
	10.0 mlbs	0.022	0.65	0.999
	10.5 mlbs	0.049	0.745	0.999
	11.0 mlbs	0.114	0.821	0.999
	11.5 mlbs	0.193	0.852	0.999
	12.0 mlbs	0.281	0.892	0.999
	12.5 mlbs	0.399	0.912	0.999
	13.0 mlbs	0.517	0.931	0.999
	13.5 mlbs	0.609	0.942	0.999
	14.0 mlbs	0.707	0.95	0.999
	15.0 mlbs	0.829	0.962	0.999
	16.0 mlbs	0.916	0.968	0.999