

Northwest Atlantic Mackerel Supplementary Material

Table S1: Northwest Atlantic mackerel short-term projections at $F_{MSY\ proxy}$ derived by sampling from an empirical cumulative distribution function based on recruitment estimates from 1999 onward

		2020	2021	2022	2023
SSB (mt)	Median	62,039	69,471	83,273	102,420
	5th Percentile	27,791	29,489	38,175	53,347
	95th Percentile	120,790	138,228	168,577	212,244
Recruitment (000s)	Median	155,704	155,515	155,323	155,708
	5th Percentile	27,511	27,684	27,526	27,570
	95th Percentile	743,849	746,511	746,913	746,040
January 1 biomass (mt)	Median	91,810	106,585	119,000	141,340
	5th Percentile	52,409	57,350	58,516	76,176
	95th Percentile	159,039	199,304	238,154	280,802
Catch (mt)	Median	18,038	23,184	14,673	18,276
	5th Percentile	18,038	23,184	6,508	9,281
	95th Percentile	18,038	23,184	29,171	37,018

Table S2: Northwest Atlantic mackerel short-term projections at $F_{MSY\ proxy}$ derived by sampling from an empirical cumulative distribution function based on recruitment estimates from 2009 onward

		2020	2021	2022	2023
SSB (mt)	Median	60,343	58,709	60,723	69,562
	5th Percentile	25,875	19,329	22,146	33,033
	95th Percentile	119,169	126,956	126,182	125,118
Recruitment (000s)	Median	128,885	128,784	128,338	128,886
	5th Percentile	26,493	26,517	26,500	26,508
	95th Percentile	280,899	281,681	281,799	281,542
January 1 biomass (mt)	Median	84,110	86,355	83,327	93,484
	5th Percentile	44,831	42,761	36,047	48,580
	95th Percentile	151,571	160,115	159,473	159,522
Catch (mt)	Median	18,038	23,184	10,808	12,571
	5th Percentile	18,038	23,184	3,712	5,683
	95th Percentile	18,038	23,184	23,175	23,335

Figure S1: Time series of northwest Atlantic mackerel catch (mt) with two-year projections at $F_{msy\ proxy}$ for 2005-2023. Short-term projections are shown for three recruitment scenarios, developed by sampling from an empirical cumulative distribution function based on recruitment estimates from 1975 onward, 1999 onward and 2009 onward. Catch in 2020 was assumed to equal preliminary estimates of total catch and 2021 catch was assumed to equal the sum of current US and Canadian quotas. The solid lines represent the reported catches and the median of the catch for each recruitment scenario. The dotted lines represent the 90% confidence intervals.

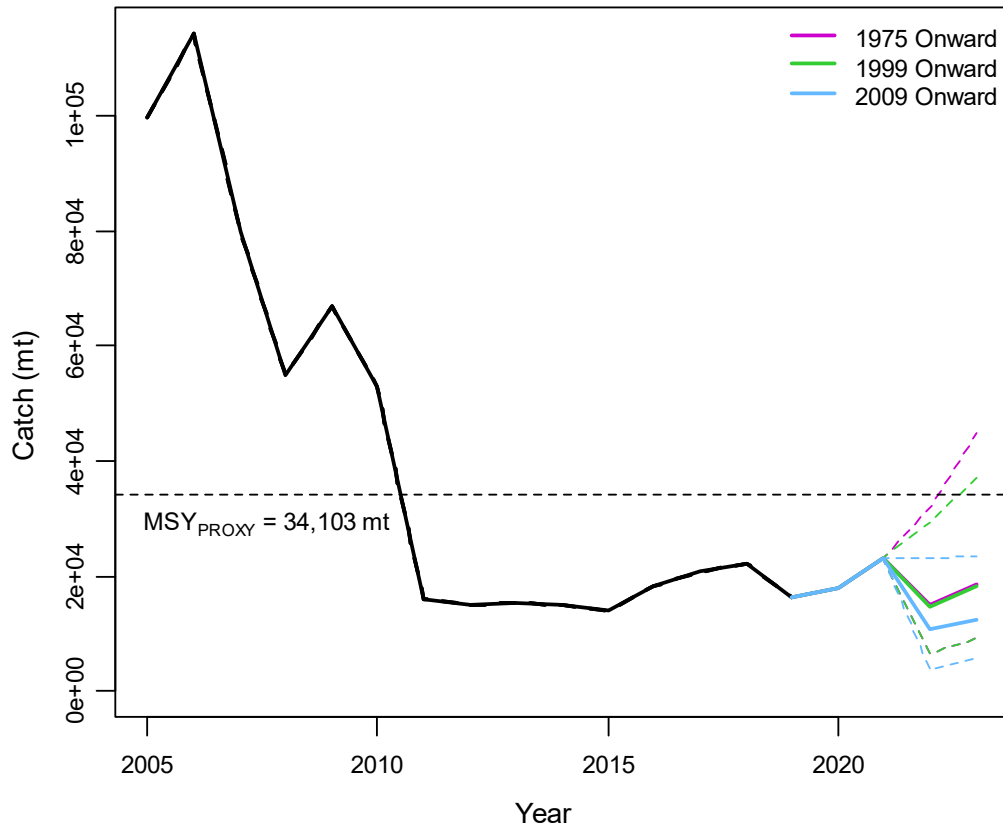


Figure S2: Time series of northwest Atlantic mackerel spawning stock biomass (mt) with two-year projections at $F_{msy\ proxy}$ for 2005-2023. Short-term projections are shown for three recruitment scenarios, developed by sampling from an empirical cumulative distribution function based on recruitment estimates from 1975 onward, 1999 onward and 2009 onward. Catch in 2020 was assumed to equal preliminary estimates of total catch and 2021 catch was assumed to equal the sum of current US and Canadian quotas. The solid lines represent the reported catches and the median of the catch for each recruitment scenario. The dotted lines represent the 90% confidence intervals.

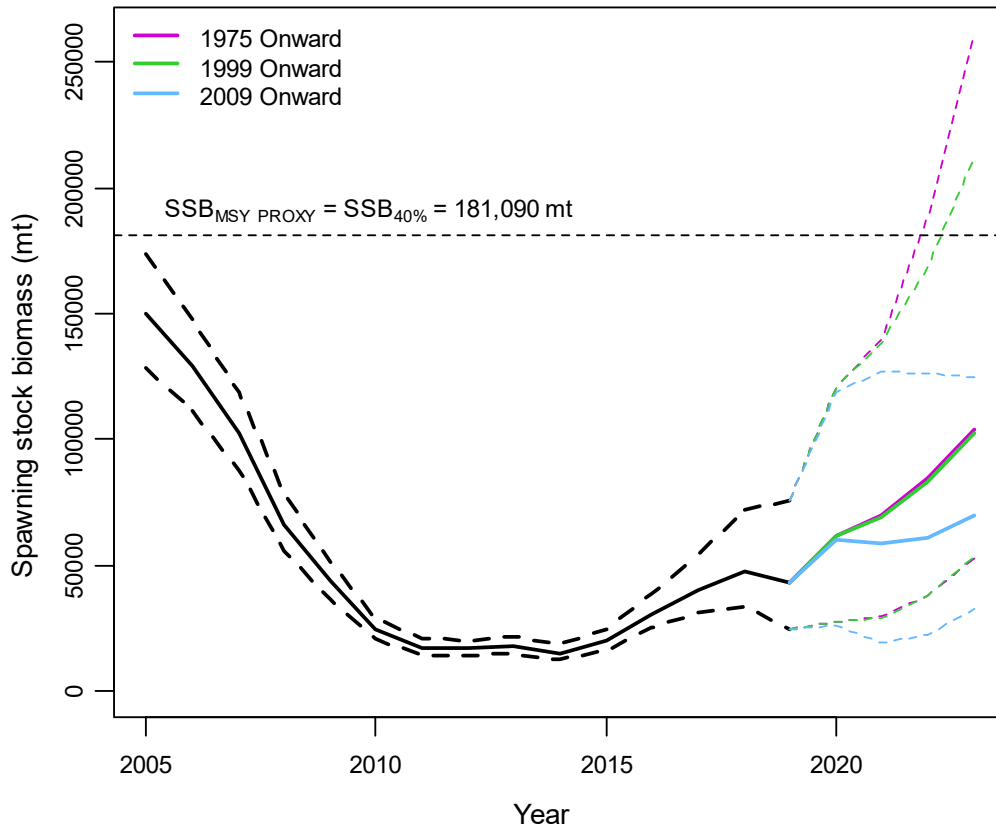


Figure S3: Likelihood profile of natural mortality for the final ASAP model. A constant natural mortality of 0.2 (blue circle) was used in the final ASAP model and the minimum value from the profile corresponded to a natural mortality of 0.26 (orange circle).

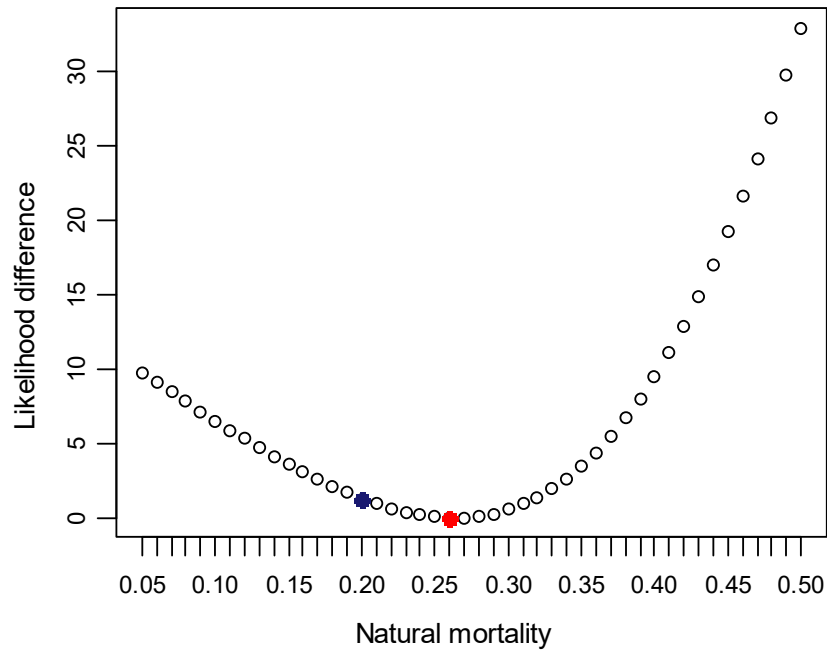


Figure S4: Northwest Atlantic mackerel maturity-at-age estimates derived from fishery-dependent Canadian samples.

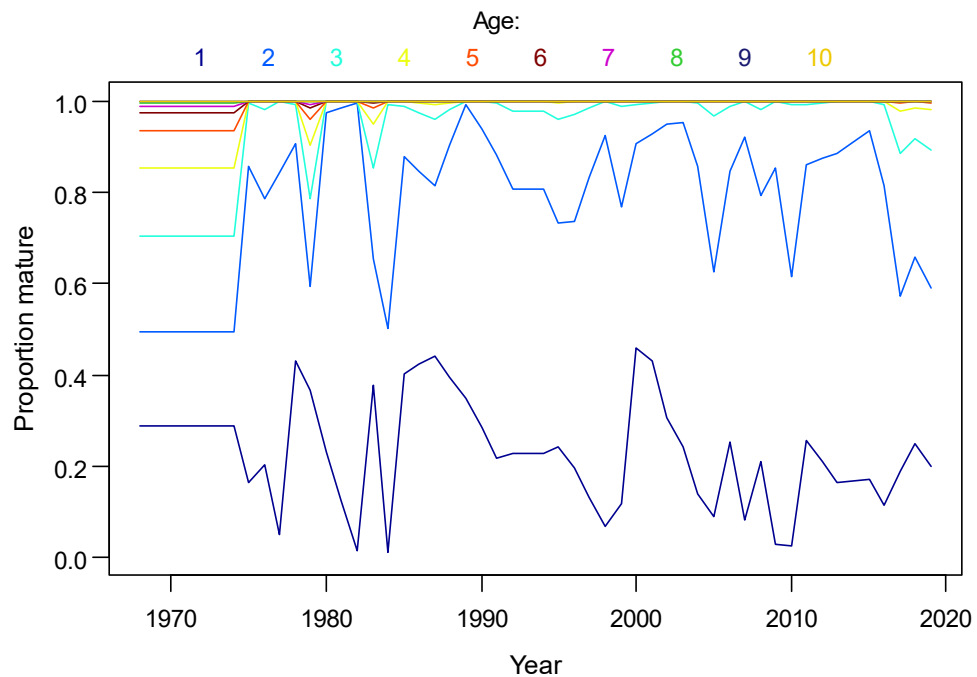
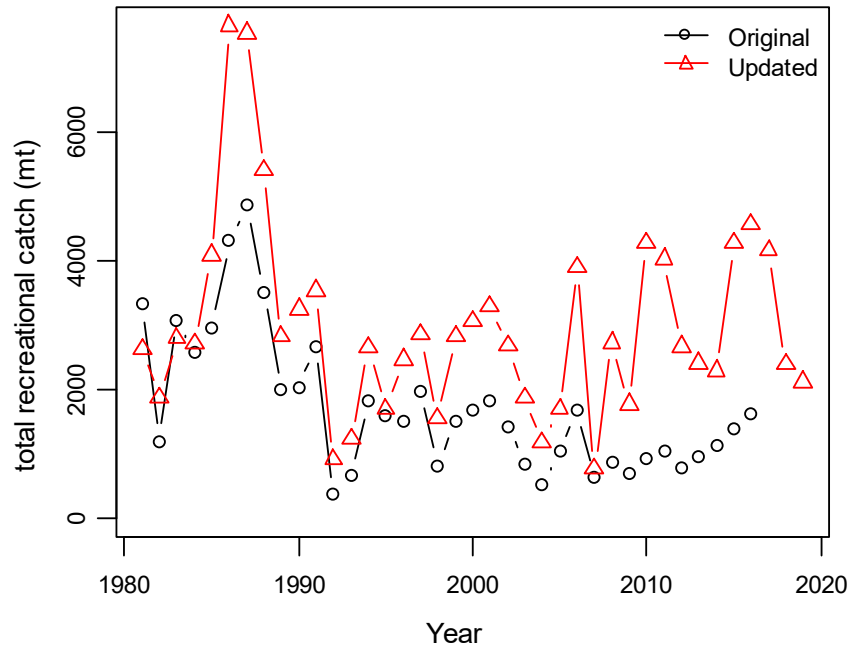


Figure S5: Comparison of northwest Atlantic mackerel (A) recreational fishery (B) and total fishery catch estimates (mt) from the original method and the updated estimates calibrated to the new effort survey.

A)



B)

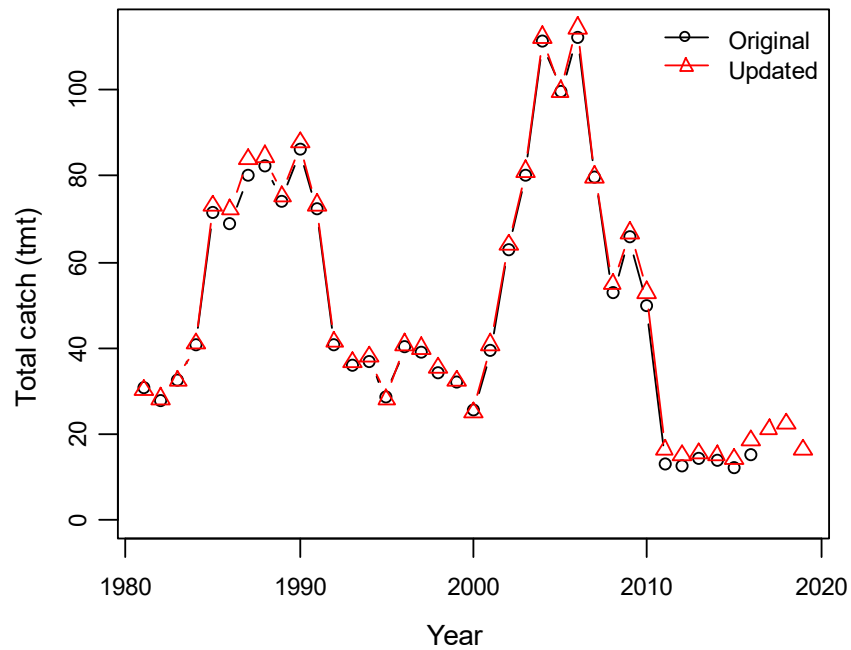
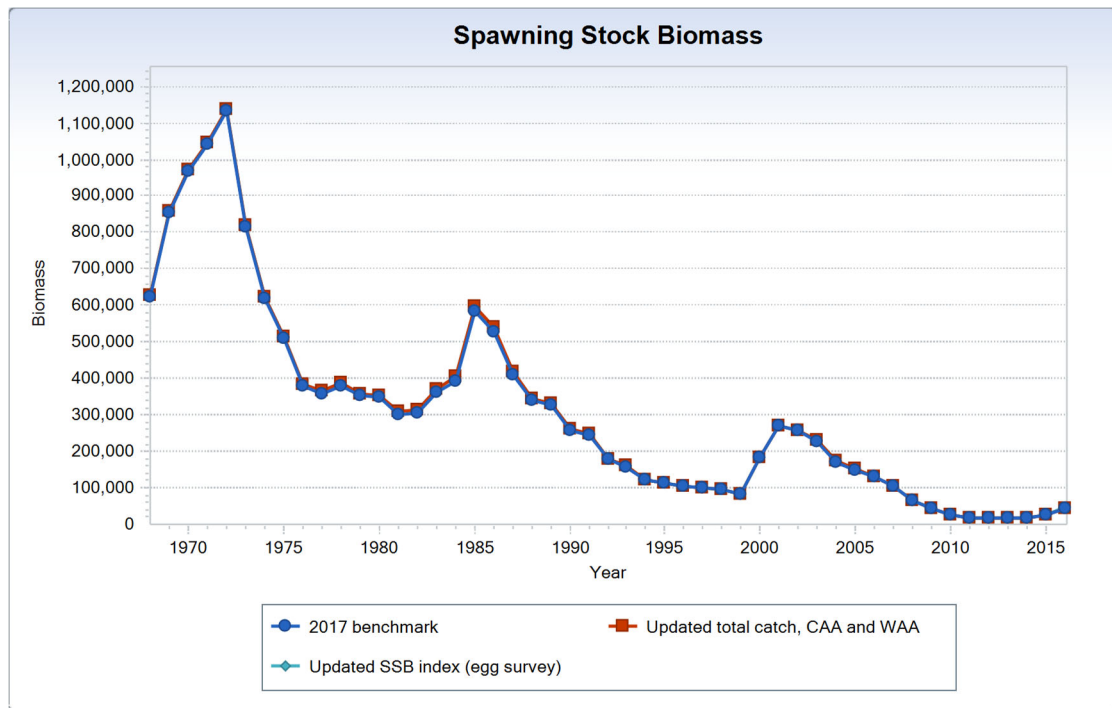


Figure S6: Comparison of (A) spawning stock biomass and (B) fishing mortality estimates from bridge runs updating the fishery catch time series and fishery-independent spawning biomass index in the 2017 benchmark model.

A)



B)

