

Supplemental Table 1. Final binomial and lognormal submodel results for Atlantic Sharpnose Shark for the entire Southeast Area Monitoring and Assessment Program Bottom Longline Survey dataset. Significant factors are indicated by a $p < 0.05$. Factors in the model include Year (2008-2021), Partner (e.g., Texas, Louisiana, Mississippi, and Alabama), Month (March – October), Depth (m), Bottom Dissolved Oxygen (Bottom Dis O₂; mg/l), Bottom Salinity (Bottom Sal; psu), and Bottom Temperature (Bottom Temp; °C). AIC: Akaike information criterion, Num DF: Numerator of degrees of freedom, Den DF: Denominator degrees of freedom, F Value: F statistic comparing sample means, Pr>ChiSq: Probability of a higher Chi-Square value, Pr>F: Probability of a higher F value.

Effect	Binomial Tests (AIC 7287.0)						Lognormal Tests (AIC 7287.0)			
	Num DF	Den DF	Chi-Square	F Value	Pr > ChiSq	Pr > F	Num DF	Den DF	F Value	Pr > F
Year	12	1527	70.33	5.86	<.0001	<.0001	12	809	3.41	<.0001
Source	3	1527	68.89	22.96	<.0001	<.0001	3	809	20.83	<.0001
Month	7	1527	138.70	19.81	<.0001	<.0001	7	809	20.17	<.0001
Depth	Dropped	-	-	-	-	-	1	809	3.97	0.0466
Bottom Temp	1	1527	31.75	31.75	<.0001	<.0001	1	809	19.56	<.0001
Bottom Sal	1	1527	80.41	80.41	<.0001	<.0001	1	809	17.57	<.0001
Bottom Dis O ₂	1	1527	14.79	14.79	0.0001	0.0001	Dropped	-	-	-

Supplemental Table 2. Final binomial and lognormal submodel results for Blacktip Shark for the entire Southeast Area Monitoring and Assessment Program Bottom Longline Survey dataset. Significant factors are indicated by a $p < 0.05$. Factors in the model include Year (2008-2021), Partner (e.g., Texas, Louisiana, Mississippi, and Alabama), Month (March – October), Depth (m), Bottom Dissolved Oxygen (Bottom Dis O₂; mg/l), Bottom Salinity (Bottom Sal; psu), and Bottom Temperature (Bottom Temp; °C). AIC: Akaike information criterion, Num DF: Numerator of degrees of freedom, Den DF: Denominator degrees of freedom, F Value: F statistic comparing sample means, Pr>ChiSq: Probability of a higher Chi-Square value, Pr>F: Probability of a higher F value.

Effect	Binomial Tests (AIC 7147.8)						Lognormal Tests (AIC 2567.6)			
	Num DF	Den DF	Chi-Square	F Value	Pr > ChiSq	Pr > F	Num DF	Den DF	F Value	Pr > F
Year	12	1530	55.38	4.61	<.0001	<.0001	12	913	3.07	0.0003
Source	3	1530	67.81	22.60	<.0001	<.0001	3	913	18.84	<.0001
Month	7	1530	68.05	9.72	<.0001	<.0001	7	913	5.66	<.0001
Depth	Dropped	-	-	-	-	-	Dropped	-	-	-
Bottom Temp	1	1530	17.54	17.54	<.0001	<.0001	1	913	6.12	0.0136
Bottom Sal	1	1530	93.11	93.11	<.0001	<.0001	1	913	7.02	0.0082
Bottom Dis O ₂	Dropped	-	-	-	-	-	Dropped	-	-	-

Supplemental Table 3. Final binomial and lognormal submodel results for Red Drum for the entire Southeast Area Monitoring and Assessment Program Bottom Longline Survey dataset. Significant factors are indicated by a $p < 0.05$. Factors in the model include Year (2008-2021), Partner (e.g., Texas, Louisiana, Mississippi, and Alabama), Month (March – October), Depth (m), Bottom Dissolved Oxygen (Bottom Dis O₂; mg/l), Bottom Salinity (Bottom Sal; psu), and Bottom Temperature (Bottom Temp; °C). AIC: Akaike information criterion, Num DF: Numerator of degrees of freedom, Den DF: Denominator degrees of freedom, F Value: F statistic comparing sample means, Pr>ChiSq: Probability of a higher Chi-Square value, Pr>F: Probability of a higher F value.

Effect	Binomial Tests (AIC 7291.3)						Lognormal Tests (AIC 1291.1)			
	Num DF	Den DF	Chi-Square	F Value	Pr > ChiSq	Pr > F	Num DF	Den DF	F Value	Pr > F
Year	12	1532	17.87	1.49	0.1197	0.1212	12	470	1.87	0.0362
Source	3	1532	34.82	11.61	<.0001	<.0001	3	470	23.26	<.0001
Month	7	1532	156.96	22.42	<.0001	<.0001	Dropped	-	-	-
Depth	Dropped	-	-	-	-	-	1	470	6.26	0.0127
Bottom Temp	Dropped	-	-	-	-	-	1	470	18.63	<.0001
Bottom Sal	1	1532	23.98	23.98	<.0001	<.0001	Dropped	-	-	-
Bottom Dis O ₂	1	1532	7.25	7.25	0.0071	0.0072	Dropped	-	-	-