

S2 table Parameters used in the population and fishery simulation loosely based on Northeast Atlantic sardine (*Sardina pilchardus*).

subject	process	model	parameter	value
population	growth	von Bertalanffy	L_∞	23cm
			k	0.45
			t_0	-1.5
	natural mortality	Gislason ¹		
			length-weight	0.0000092
	reproduction	knife edge	a_{50}	0.7
	stock-recruitment	ricker ²	virgin biomass (SSB_0)	1.70e9 – 1.85e9
			steepness (s)	{0.7, 0.75, 0.8, 0.85, 0.9, 0.95}
fishery	selectivity	double normal (dome shape)	σ	1
			σ	3
			L_{50}	3
error	fishing mortality	log-normal	cv	0.4
	recruitment	log-normal	cv	0.4
	survey catchability	log-normal	cv	0.4
	F reference point	log-normal	cv	0.4

¹ $\ln(M) = 0.55 - 1.61 \ln L + 1.44 \ln L_{inf} + \ln K$ (Gislason H, Daan N, Rice JC, Pope JG. Size, growth, temperature and the natural mortality of marine fish. Fish Fish. 2010;11(2):149–158.)

² $R = aSSBe^{-bSSB}$ where $a = e^{\frac{b \cdot SSB_0}{spr0}}$, $b = \frac{\log(5 \cdot s)}{0.8 \cdot SSB_0}$, SSB_0 is the SSB of the unfished population and $spr0$ is the spawning stock biomass per recruit of the unfished population.