The 2015 stock assessment of arrowtooth flounder (*Atheresthes stomias*) in California, Oregon, and Washington waters

by

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Executive Summary

Stock, data and assessment

A catch and index only stock assessment (i.e., "data-moderate") was applied to arrowtooth flounder treated as one coastwide stock. Three fleets and four surveys were used. Updates to both input types were made since the last assessment (Kaplan and Helser 2007). Stock Synthesis was used for all models and model treatments included maximum likelihood estimation (MLE), Markov-chain Monte Carlo (MCMC), and extended Simple Stock Synthesis (XSSS).

Derived outputs

The MLE model showed low sensitivity in derived quantities to abundance index use, steepness values and selectivity assumptions. The largest relative sensitivity was in spawning stock biomass when the old catch stream was used, but it was not a large discrepancy. The new assessment demonstrated higher biomasses in all models relative to the 2007 model (Table ES-1). Bayesian models had the highest estimated biomass (Figure ES-1), stock status (Figure ES-2) and uncertainty (Table ES-1). The differences in spawning biomass between the MLE and Bayesian models are large. No models had any significant stock status density below the target biomass reference point of $SB_{30\%}$, thus there seems to be no evidence that this is an overfished stock or that it is near the target biomass. OFL values are much higher for the Bayesian models versus the MLE. The MCMC run using a lnR_0 prior of N(11.3,0.78) is the recommended base case (Table ES-1).

Table ES-1. Derived quantity and parameter estimates for each arrowtooth flounder assessment treatment compared to the 2007 assessment. Values provided are medians with the coefficient of variation in parentheses. Proposed base case indicated in gray.

			MCMC			XSSS		
Output		MLE	lnR_0: 3-18	lnR_0: 3-14	lnR_0: N(11.3,0.78)	$2007_{06\ depletion}$	$2015_{14\ depletion}$	2007 base case
Derived quantitiy	SB0	106733 (0.12)	289431 (2.38)	169651 (1.36)	158178 (0.91)	259118 (0.69)	193673 (0.56)	80313 (0.08)
	SB2015	66085 (0.21)	257529 (2.39)	133817 (1.48)	120938 (1.1)	213227 (0.82)	141227 (0.74)	38125
	SB2015/SB0	0.62 (0.12)	0.89 (0.18)	0.79 (0.17)	0.77 (0.15)	0.83 (0.13)	0.73 (0.16)	0.47
	OFL2015	8223 (0.21)	70291 (2.39)	16610 (1.47)	15019 (1.1)	45180 (0.93)	28092 (0.84)	6523
	OFL2016	8082 (0.2)	58973 (2.39)	15762 (1.46)	14304 (1.07)	40015 (0.88)	25107 (0.79)	6207
Parameter	Mfemale	0.17	0.17	0.17	0.17	0.12 (0.34)	0.12 (0.3)	0.17
	Mmale	0.27	0.27	0.27	0.27	0.26 (0.32)	0.27 (0.31)	0.27
	h	0.82 (0.11)	0.8 (0.11)	0.81 (0.11)	0.81 (0.11)	0.85 (0.09)	0.85 (0.09)	0.9
	lnR0	10.54 (0.01)	11.54 (0.18)	11.01 (0.09)	10.95 (0.05)	10.89 (0.07)	10.48 (0.06)	10.26 (0.01)
	Tri xSD	0.18 (0.49)	0.28 (0.49)	0.25 (0.5)	0.25 (0.5)	0.21 (0.03)	0.21 (0.04)	0
	AFSC slope xSD	0.42 (0.50)	0.62 (0.70)	0.62 (0.68)	0.61 (0.66)	0.43 (0.01)	0.43 (0.01	0.07
	NWFSC slope xSD	0.08 (1.29)	0.18 (1.13)	0.17 (1.12)	0.17 (1.15)	0.06 (0.04)	0.07 (0.07)	0.36
	NWFSC xSD	0.03 (1.00)	0.08 (0.64)	0.06 (0.67)	0.06 (0.64)	0.05 (0.154)	0.04 (0.21)	0

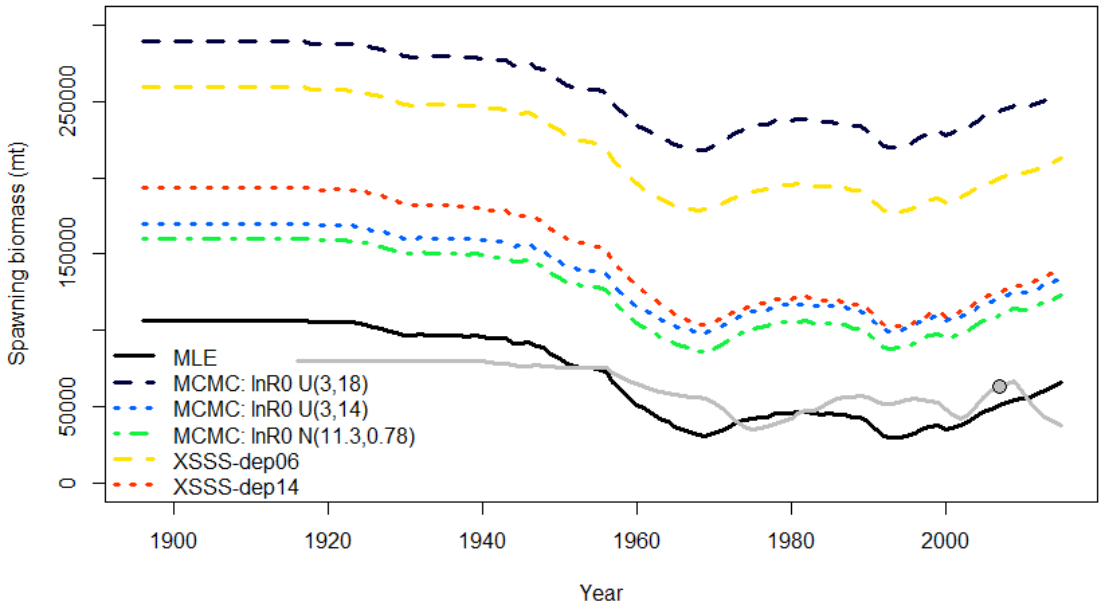

Figure ES-1. Spawning biomass time series across all potential base case models and treatments compared to the 2007 assessment. The point indicates where the 2007 assessment ended. Time series beyond that point are projected values. Proposed base case is "MCMC lnR_0 N(11.3,0.78)"

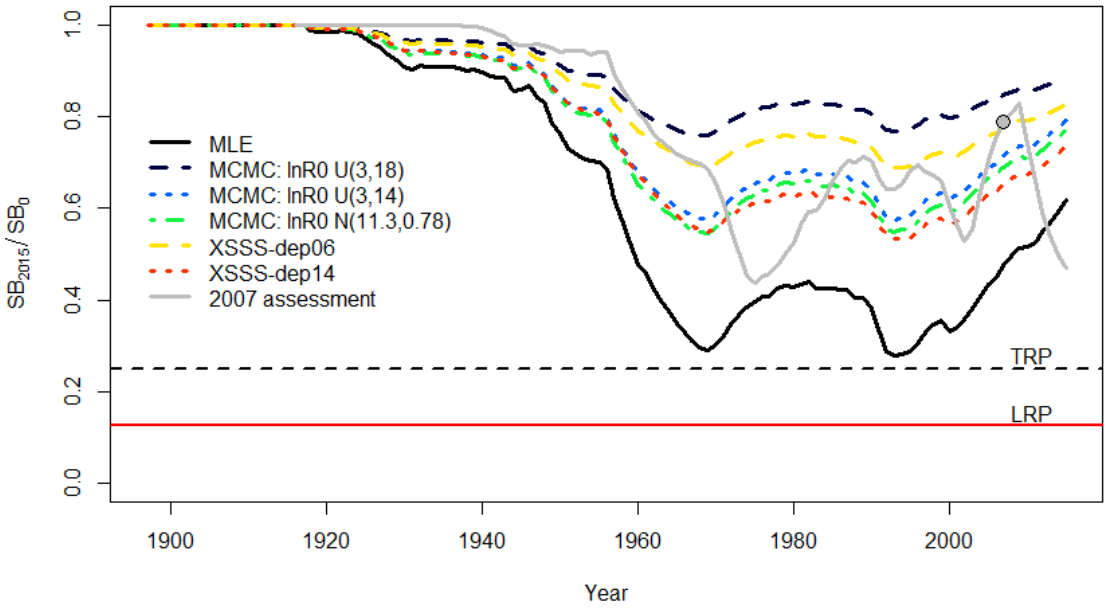

Figure ES-2. Stock status time series across all potential base case models and treatments compared to the 2007 assessment. The point indicates where the 2007 assessment ended. Time series beyond that point projected values. Proposed base case is "MCMC lnR_0 N(11.3,0.78)"

Decision table

To be determined after SSC review.