

A Proposal for Determining the Final Desirable Maximum Catch of Directed Sardine West of Cape Agulhas

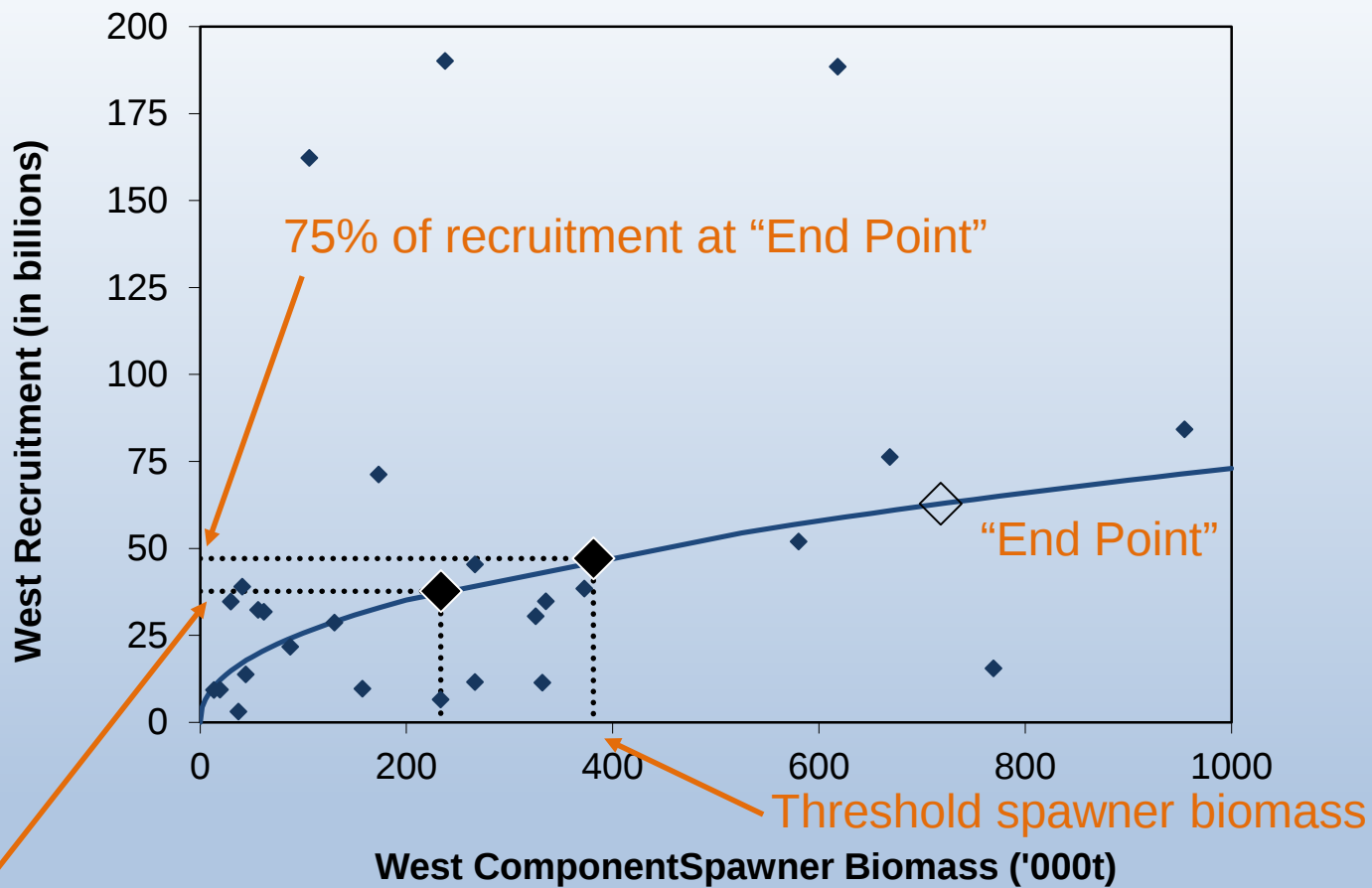
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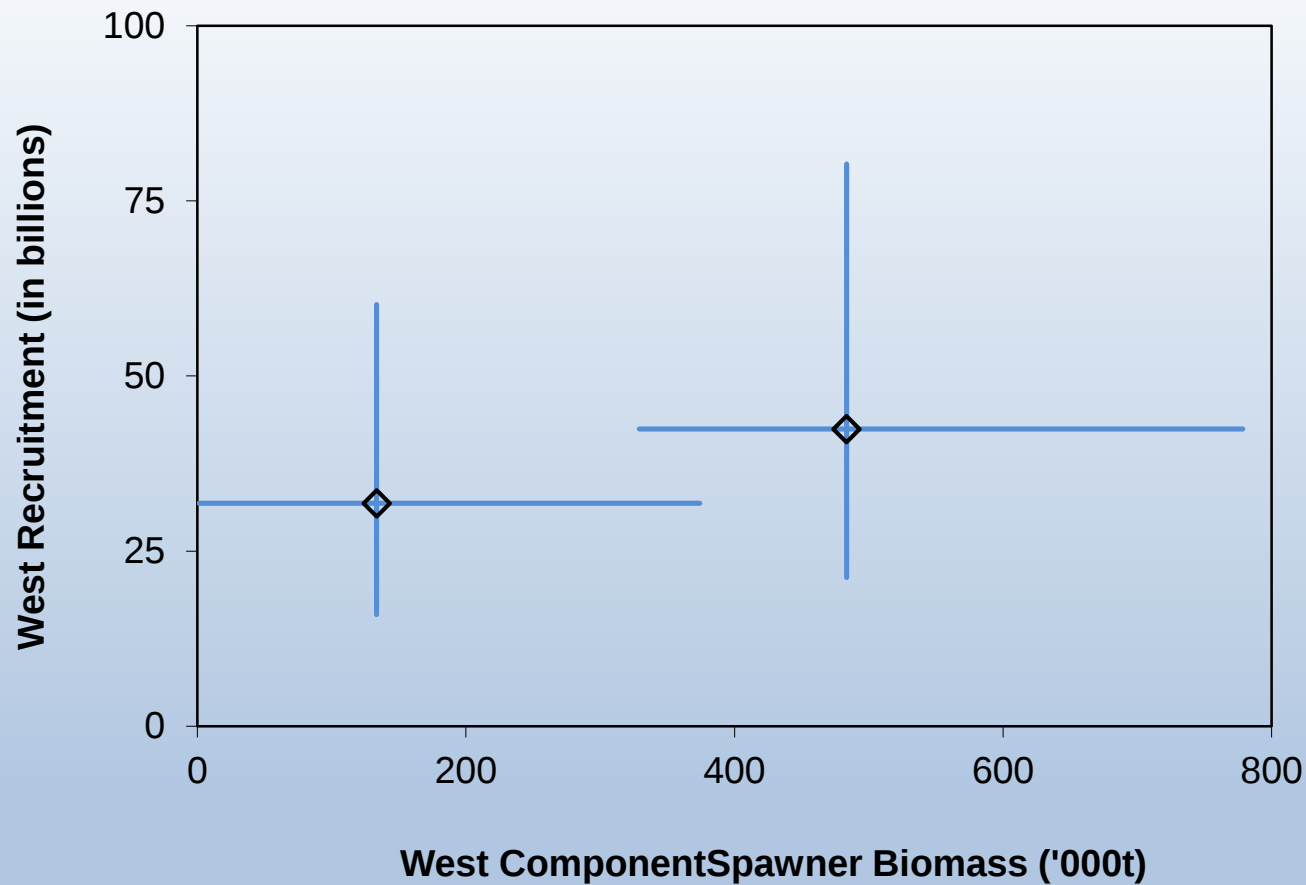
General Parametric Stock Recruitment Relationship



60% of recruitment at "End Point"

This is one draw from the posterior distribution of SSB-Rec pairs (1000 draws are used in projections)

Range of “End Points” and Thresholds

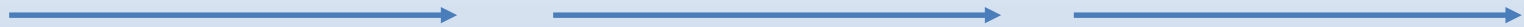


Projections

- OMP-17 simulation testing framework with some assumptions:
 - New sardine OM with General Parametric curve
 - Prop of 1 year olds moving = 0.37
 - Split of sardine catch between components 'hardwired'
 - May 2017 anchovy recruitment: avg 11-15
 - May 2017 sardine recruitment south of Cape Agulhas: avg 11-15

$$P(SSB_{2017} < SSB_{\text{threshold}})$$

	Threshold at 70% of end point					Threshold at 75% of end point					Threshold at 80% of end point				
	June 2017 Survey Estimate of Recruitment														
	1	3	5	7.3	13	1	3	5	7.3	13	1	3	5	7.3	13
ot	0.52	0.46	0.43	0.40	0.34	0.60	0.56	0.52	0.48	0.42	0.66	0.63	0.61	0.59	0.54



Decreased risk with increased 2017 recruitment

$$P(SSB_{2017} < SSB_{\text{threshold}})$$

	Threshold at 70% of end point					Threshold at 75% of end point					Threshold at 80% of end point				
Catch ('000t)	June 2017 Survey Estimate of Recruitment														
	1	3	5	7.3	13	1	3	5	7.3	13	1	3	5	7.3	13
0			0.43					0.52					0.61		
10			0.45					0.54					0.62		
20			0.45					0.54					0.63		
21.4			0.46					0.54					0.63		
30			0.46					0.55					0.63		
40			0.47					0.56					0.63		
50			0.48					0.57					0.64		

Increased risk with higher catches

$$P(SSB_{2017} < SSB_{\text{threshold}})$$

	Threshold at 70% of end point					Threshold at 75% of end point					Threshold at 80% of end point				
Catch (’000t)	June 2017 Survey Estimate of Recruitment														
	1	3	5	7.3	13	1	3	5	7.3	13	1	3	5	7.3	13
0	0.52	0.46	0.43	0.40	0.34	0.60	0.56	0.52	0.48	0.42	0.66	0.63	0.61	0.59	0.54
10	0.54	0.48	0.45	0.41	0.35	0.61	0.57	0.54	0.51	0.45	0.68	0.64	0.62	0.60	0.54
20	0.55	0.49	0.45	0.42	0.36	0.62	0.58	0.54	0.52	0.45	0.69	0.64	0.63	0.60	0.55
21.4	0.56	0.49	0.46	0.42	0.36	0.63	0.58	0.54	0.52	0.45	0.69	0.65	0.63	0.60	0.55
30	0.57	0.50	0.46	0.43	0.36	0.63	0.59	0.55	0.52	0.45	0.70	0.65	0.63	0.61	0.56
40	0.58	0.51	0.47	0.44	0.37	0.64	0.60	0.56	0.53	0.46	0.71	0.66	0.63	0.61	0.56
50	0.59	0.52	0.48	0.45	0.38	0.65	0.60	0.57	0.54	0.47	0.72	0.67	0.64	0.62	0.58

$$P(SSB_{2017} < SSB_{\text{threshold}})$$

	Threshold at 70% of end point					Threshold at 75% of end point					Threshold at 80% of end point				
Catch (’000t)	June 2017 Survey Estimate of Recruitment														
	1	3	5	7.3	13	1	3	5	7.3	13	1	3	5	7.3	13
0	0.52	0.46	0.43	0.40	0.34	0.60	0.56	0.52	0.48	0.42	0.66	0.63	0.61	0.59	0.54
10	0.54	0.48	0.45	0.41	0.35	0.61	0.57	0.54	0.51	0.45	0.68	0.64	0.62	0.60	0.54
20	0.55	0.49	0.45	0.42	0.36	0.62	0.58	0.54	0.52	0.45	0.69	0.64	0.63	0.60	0.55
21.4	0.56	0.49	0.46	0.42	0.36	0.63	0.58	0.54	0.52	0.45	0.69	0.65	0.63	0.60	0.55
30	0.57	0.50	0.46	0.43	0.36	0.63	0.59	0.55	0.52	0.45	0.70	0.65	0.63	0.61	0.56
40	0.58	0.51	0.47	0.44	0.37	0.64	0.60	0.56	0.53	0.46	0.71	0.66	0.63	0.61	0.56
50	0.59	0.52	0.48	0.45	0.38	0.65	0.60	0.57	0.54	0.47	0.72	0.67	0.64	0.62	0.58

No Catch + 0.02

$$P(SSB_{2017} < SSB_{\text{threshold}})$$

	Threshold at 70% of end point					Threshold at 75% of end point					Threshold at 80% of end point				
Catch ('000t)	June 2017 Survey Estimate of Recruitment														
	1	3	5	7.3	13	1	3	5	7.3	13	1	3	5	7.3	13
0	0.52	0.46	0.43	0.40	0.34	0.60	0.56	0.52	0.48	0.42	0.66	0.63	0.61	0.59	0.54
10	0.54	0.48	0.45	0.41	0.35	0.61	0.57	0.54	0.51	0.45	0.68	0.64	0.62	0.60	0.54
20	0.55	0.49	0.45	0.42	0.36	0.62	0.58	0.54	0.52	0.45	0.69	0.64	0.63	0.60	0.55
21.4	0.56	0.49	0.46	0.42	0.36	0.63	0.58	0.54	0.52	0.45	0.69	0.65	0.63	0.60	0.55
30	0.57	0.50	0.46	0.43	0.36	0.63	0.59	0.55	0.52	0.45	0.70	0.65	0.63	0.61	0.56
40	0.58	0.51	0.47	0.44	0.37	0.64	0.60	0.56	0.53	0.46	0.71	0.66	0.63	0.61	0.56
50	0.59	0.52	0.48	0.45	0.38	0.65	0.60	0.57	0.54	0.47	0.72	0.67	0.64	0.62	0.58

No Catch + 0.03

$$P(SSB_{2017} < SSB_{\text{threshold}})$$

	Threshold at 100 000t					Threshold at 150 000t				
Catch (’000t)	June 2017 Survey Estimate of Recruitment									
	1	3	5	7.3	13	1	3	5	7.3	13
0	0.59	0.40	0.29	0.19	0.08	0.89	0.82	0.75	0.68	0.52
10	0.64	0.47	0.34	0.25	0.11	0.90	0.84	0.78	0.71	0.57
20	0.68	0.51	0.37	0.28	0.13	0.91	0.86	0.80	0.74	0.59
21.4	0.68	0.51	0.38	0.28	0.13	0.91	0.86	0.80	0.74	0.59
30	0.70	0.54	0.41	0.31	0.15	0.91	0.86	0.81	0.75	0.60
40	0.72	0.57	0.45	0.33	0.17	0.92	0.87	0.83	0.77	0.62
50	0.74	0.60	0.48	0.36	0.19	0.93	0.89	0.84	0.78	0.65

Final Directed Sardine TAC for 2017

May Survey Estimate of Recruitment (billions)	Final TAC (t) rounded to nearest 1000t
0	29 955t
1	32 000t
3	36 000t
5	41 000t
7.3	46 000t
13	58 000t