

A summary of sardine assessment and projection work towards SWG-PEL management recommendations

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Carryn de Moor



Marine Resource Assessment and Management Group (MARAM)
Department of Mathematics and Applied Mathematics
University of Cape Town

A Summary of Work

- Managing sardine under Exceptional Circumstances
- Short-term projections under constant catches based on updated assessments
- Delayed survey & FRAP deadlines meant the process needed to be short-cut / fast tracked
- FISHERIES/2021/OCT/SWG-PEL/62
- FISHERIES/2021/DEC/SWG-PEL/63
- FISHERIES/2021/DEC/SWG-PEL/64
- FISHERIES/2022/JAN/SWG-PEL/04
- FISHERIES/2022/FEB/SWG-PEL/05

Final year survey LF

- **FISHERIES/2021/OCT/SWG-PEL/62**
- Given 'short-cuts' required, a proposal was made to exclude November 2021 survey LF from the updated assessment
- This doc showed that the sardine assessment is sensitive to the inclusion of the final year's survey LF
 - Tested using three past assessments
- This doc showed that the ad-hoc method used to recommend catch limits would have resulted in different catch limit recommendations if final year's survey LF was excluded
 - Tested using two past short-term projections

Testing the assessment

- **FISHERIES/2021/DEC/SWG-PEL/63**
- Updated data as far as possible (Appendix)
- Final assessment would only replace November 2021 survey biomasses (CVs) and LFs

Model	Survey estimated biomass west of Cape Agulhas		Survey estimated biomass east of Cape Agulhas		Survey length frequency west of Cape Agulhas	Survey length frequency east of Cape Agulhas
	Biomass	CV	Biomass	CV		
S_0	51 678t	0.729	197 263t	0.606	Nov 2020	Nov 2020
S_1	30 000t	0.729	50 000t	0.606	Nov 2020	Nov 2020
S_2	51 678t	0.729	100 000t	0.606	Nov 2020	Nov 2020
S_3	100 000t	0.729	197 263t	0.606	Nov 2020	Nov 2020
S_4	30 000t	0.729	197 263t	0.606	Nov 2020	Nov 2020
S_5	100 000t	0.729	50 000t	0.606	Nov 2020	Nov 2020
S_6	51 678t	0.729	197 236t	0.606	Nov 2016 (small fish)	Nov 2020
S_7	51 678t	0.729	197 236t	0.606	Nov 2015 (medium fish)	Nov 2020
S_8	51 678t	0.729	197 236t	0.606	Nov 2011 (large fish)	Nov 2020
S_9	51 678t	0.729	197 236t	0.606	Nov 2020	Nov 2016 (small fish)
S_{10}	51 678t	0.729	197 236t	0.606	Nov 2020	Nov 2013 (medium fish)
S_{11}	51 678t	0.729	197 236t	0.606	Nov 2020	Nov 2011 (large fish)

Testing the assessment

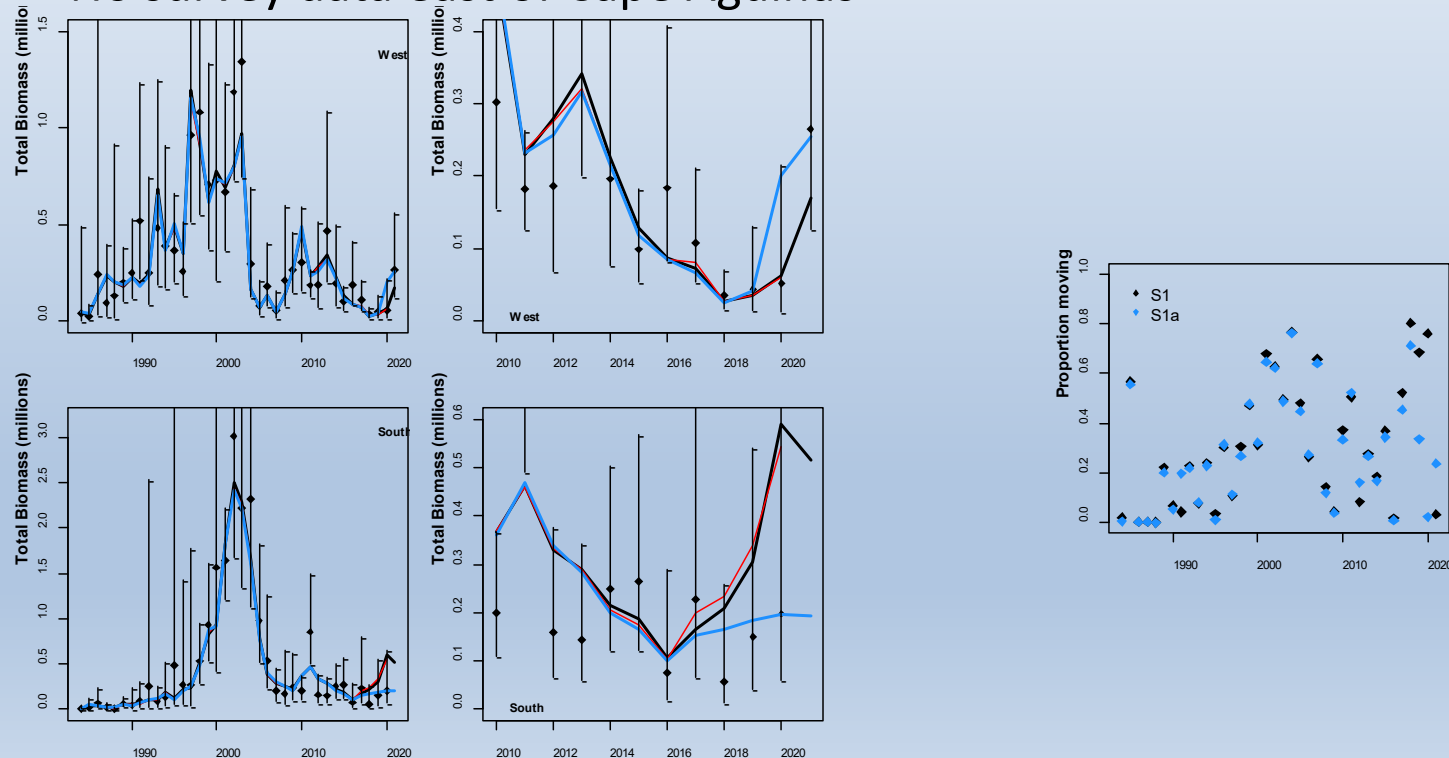
- **FISHERIES/2021/DEC/SWG-PEL/63**
- Exclude parasite prevalence-at-length
- Be cautious in drawing conclusions about the biomass on the south coast. It is possible the biomass is over-estimated. 'Force' the model to fit south coast November 2020 survey estimate
 - Apparent conflict (with this hypothesis) between 'relatively high' survey estimates of recruitment west of CA in some recent years and remaining low November survey biomass west of CA
- Indicated how model biomass and recruitments might change for different November 2021 data

Testing the short-term projections

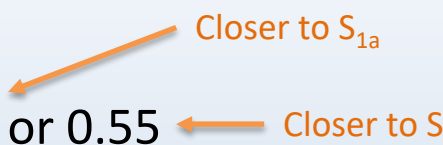
- **FISHERIES/2021/DEC/SWG-PEL/64**
- Same methodology as before
- Proportion moving 0.15, 0.35 or 0.55
- Focussed only on two statistics (20%ile in relative multiplicative change in effSSB & 20% in additive change in B)
- TACs increased/decreased (to a smaller extent) given changes in observations
- Suggested (with range of B^{obs} tested) to expect a lower TAC for west coast

Updated approximate assessment

- **FISHERIES/2022/JAN/SWG-PEL/04**
- Supposed to include November 2021 survey biomass (CVs) and LFs
- December 2021 survey data west of Cape Agulhas considered approximate (used two values)
- No survey data east of Cape Agulhas

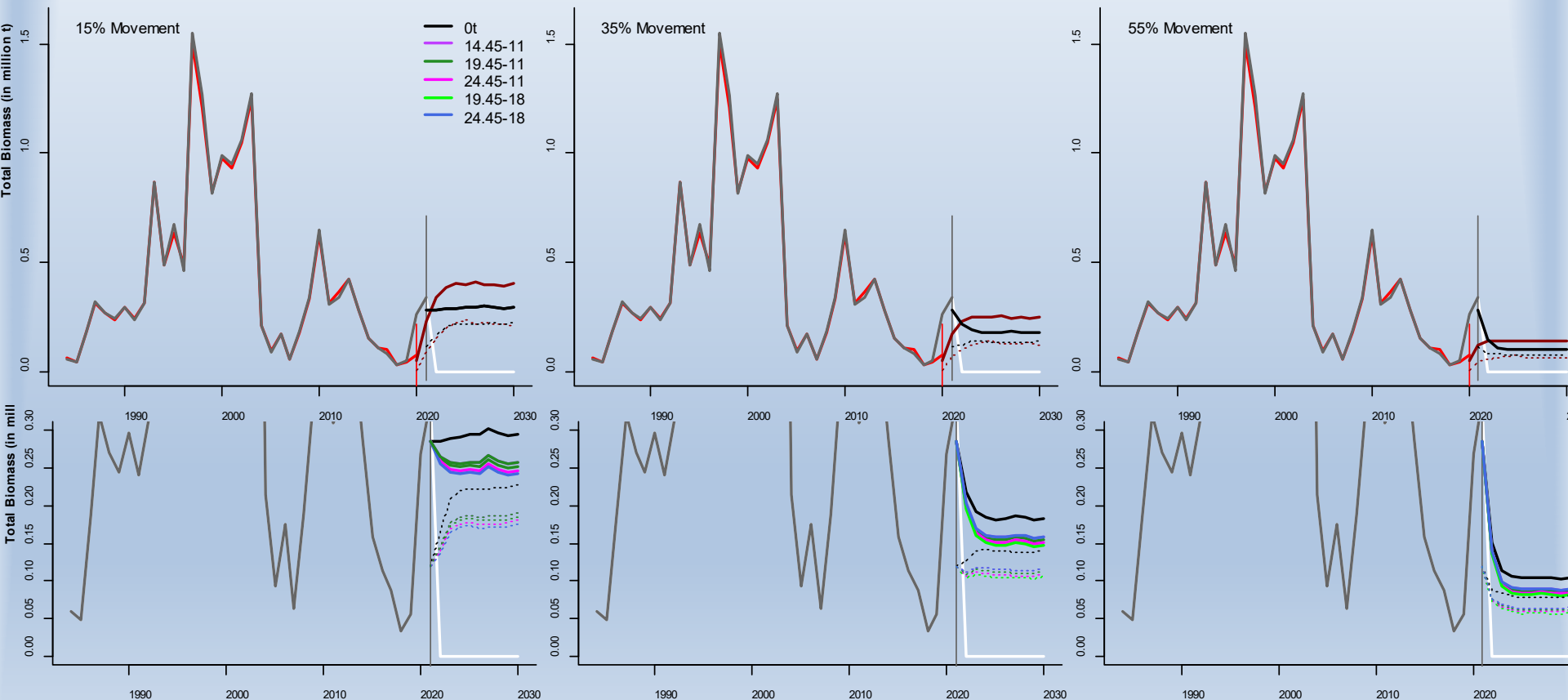


Updated short-term projections

- **FISHERIES/2022/FEB/SWG-PEL/05**
 - Same methodology as before
 - Proportion moving 0.15, 0.35 or 0.55
- 
- The diagram consists of two orange arrows. The first arrow originates from the text 'Closer to S_{1a} ' and points diagonally down and to the left towards the word 'methodology' in the second bullet point. The second arrow originates from the text 'Closer to S_1 ' and points diagonally down and to the left towards the numerical values '0.15, 0.35 or 0.55' in the third bullet point.

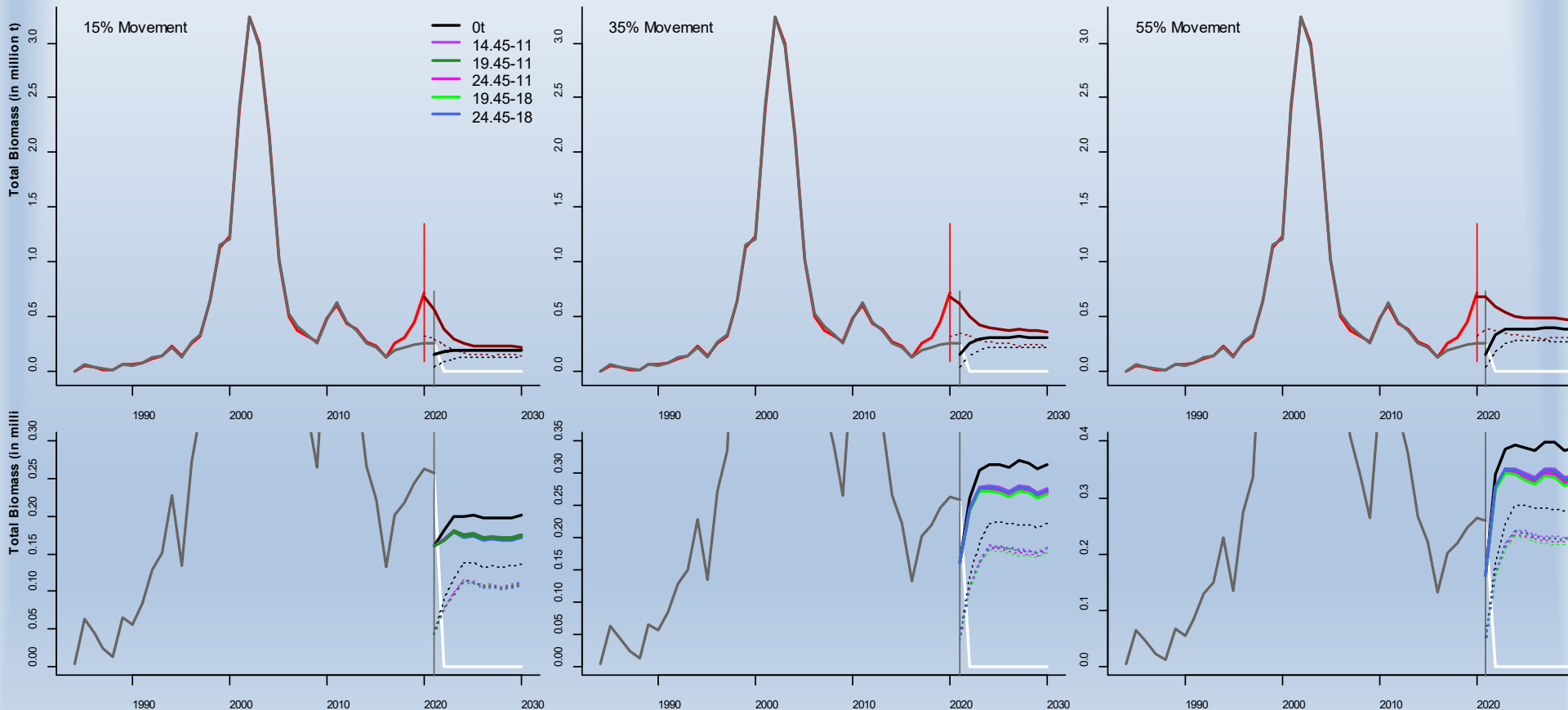
Updated short-term projections

- **FISHERIES/2022/FEB/SWG-PEL/05**
- Currently higher than estimated in Nov 2020, but now projected to decrease and stabilise at a lower level than projected a year ago



Updated short-term projections

- **FISHERIES/2022/FEB/SWG-PEL/05**
- Currently substantially lower than estimated in Nov 2020, projected to increase, but not to the level projected a year ago



Updated short-term projections

- **FISHERIES/2022/FEB/SWG-PEL/05**
- Considered same statistics as before

	Total	West	South	ByC			
					15%	35%	55%
2019	23	6.5	7	9.5	0.88		
2020	34.05	11.65	13	9.4	0.90		
	34.05 ²	13.65	13	7.4	0.90		
2021	42.85	14.45	18	10.4	0.87		
	35.95	14.45	11	10.5	0.91	0.91	0.91
	40.95	19.45	11	10.5	0.88	0.88	0.89
	45.95	24.45	11	10.5	0.86	0.86	0.86
	50.95	29.45	11	10.5	0.83	0.83	0.84
	37.95	14.45	13	10.5	0.91	0.91	0.91
	42.95	19.45	13	10.5	0.88	0.88	0.88
	47.95	24.45	13	10.5	0.86	0.86	0.86
	52.95	29.45	13	10.5	0.83	0.83	0.84
	42.95	14.45	18	10.5	0.91	0.90	0.91
	47.95	19.45	18	10.5	0.88	0.88	0.88
	52.95	24.45	18	10.5	0.85	0.85	0.86
	57.95	29.45	18	10.5	0.83	0.83	0.83
	47.95	14.45	23	10.5	0.90	0.90	0.90
	52.95	19.45	23	10.5	0.88	0.88	0.88
	57.95	24.45	23	10.5	0.85	0.85	0.85
	62.95	29.45	23	10.5	0.82	0.83	0.83

West component

South component

	Total	West	South	ByC			
					15%	35%	55%
2020	34.05	11.65	13	9.4	0.95		
	34.05	13.65	13	7.4	0.95		
2021	42.85	14.45	18	10.4	0.95		
	35.95	14.45	11	10.5	0.86	0.89	0.90
	40.95	19.45	11	10.5	0.86	0.87	0.88
	45.95	24.45	11	10.5	0.85	0.86	0.87
	50.95	29.45	11	10.5	0.84	0.85	0.86
	37.95	14.45	13	10.5	0.84	0.87	0.89
	42.95	19.45	13	10.5	0.84	0.86	0.87
	47.95	24.45	13	10.5	0.83	0.85	0.86
	52.95	29.45	13	10.5	0.82	0.84	0.85
	42.95	14.45	18	10.5	0.80	0.84	0.86
	47.95	19.45	18	10.5	0.79	0.83	0.85
	52.95	24.45	18	10.5	0.78	0.82	0.83
	57.95	29.45	18	10.5	0.78	0.80	0.82
	47.95	14.45	23	10.5	0.74	0.80	0.83
	52.95	19.45	23	10.5	0.74	0.79	0.82
	57.95	24.45	23	10.5	0.73	0.78	0.81
	62.95	29.45	23	10.5	0.72	0.77	0.80

Updated short-term projections

- **FISHERIES/2022/FEB/SWG-PEL/05**
- Considered same statistics as before

	Total	West	South	ByC	15%	35%	55%
2020	0	0	0	0		-8	
	34.05	11.65	13	9.4		-20	
	34.05	13.65	13	7.4		-20	
2021	0	0	0	0		41	
	42.85	14.45	18	10.4		24	
	0	0	0	0	-94	-175	-261
	35.95	14.45	11	10.5	-114	-190	-272
	40.95	19.45	11	10.5	-117	-192	-273
	45.95	24.45	11	10.5	-120	-195	-275
	50.95	29.45	11	10.5	-124	-197	-277
	37.95	14.45	13	10.5	-114	-190	-272
	42.95	19.45	13	10.5	-117	-192	-273
	47.95	24.45	13	10.5	-120	-195	-275
	52.95	29.45	13	10.5	-124	-197	-277
	42.95	14.45	18	10.5	-114	-190	-272
	47.95	19.45	18	10.5	-117	-192	-273
	52.95	24.45	18	10.5	-120	-195	-275
	57.95	29.45	18	10.5	-124	-197	-277
	47.95	14.45	23	10.5	-114	-190	-272
	52.95	19.45	23	10.5	-117	-192	-273
	57.95	24.45	23	10.5	-120	-195	-275
	62.95	29.45	23	10.5	-124	-197	-277

West component

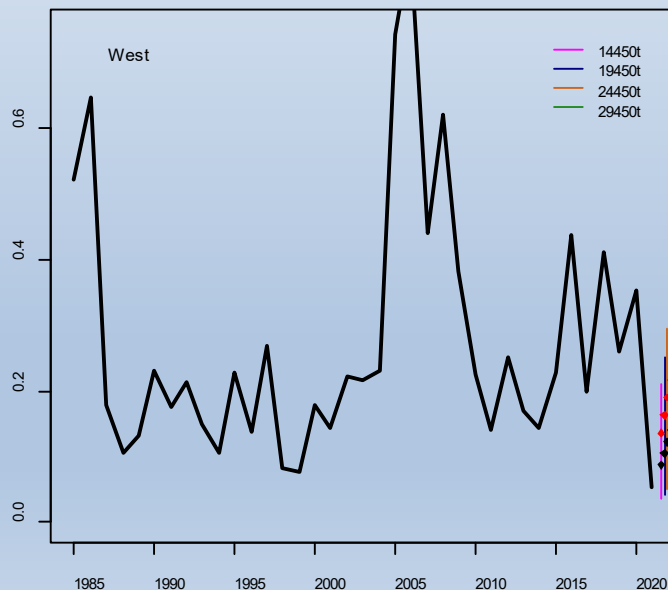
South component

	Total	West	South	ByC	15%	35%	55%
2020	0	0	0	0		46	
	34.05	11.65	13	9.4		26	
	34.05	13.65	13	7.4		26	
2021	0	0	0	0		-143	
	42.85	14.45	18	10.4		-165	
	0	0	0	0	-88	-22	38
	35.95	14.45	11	10.5	-99	-38	17
	40.95	19.45	11	10.5	-100	-39	16
	45.95	24.45	11	10.5	-100	-40	14
	50.95	29.45	11	10.5	-101	-41	12
	37.95	14.45	13	10.5	-101	-39	16
	42.95	19.45	13	10.5	-101	-41	14
	47.95	24.45	13	10.5	-102	-42	12
	52.95	29.45	13	10.5	-102	-43	10
	42.95	14.45	18	10.5	-104	-43	13
	47.95	19.45	18	10.5	-105	-44	11
	52.95	24.45	18	10.5	-105	-45	9
	57.95	29.45	18	10.5	-106	-46	7
	47.95	14.45	23	10.5	-108	-46	9
	52.95	19.45	23	10.5	-108	-48	7
	57.95	24.45	23	10.5	-109	-49	5
	62.95	29.45	23	10.5	-109	-50	3

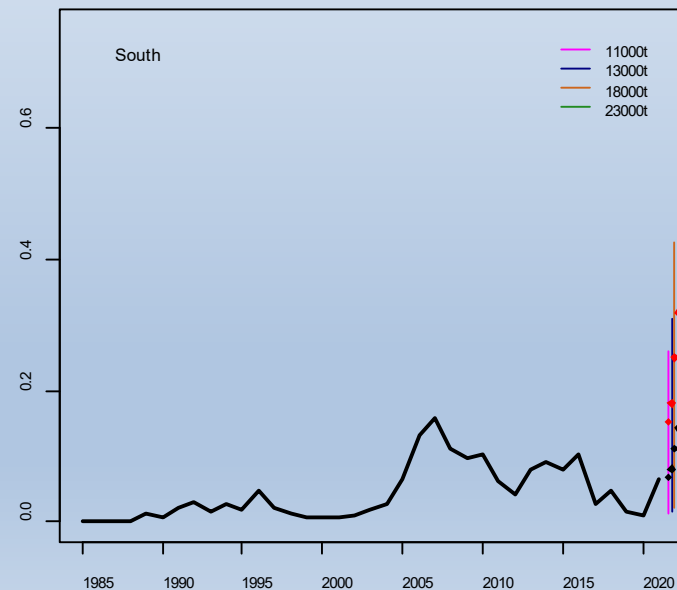
Updated short-term projections

- **FISHERIES/2022/FEB/SWG-PEL/05**
- Exploitation rates

19 450t
10.5% [4.3%,25.2%]
16.3% - 20%ile



13 000t
8.1% [1.5%,30.8%]
18.1% - 20%ile



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Thank you!