Comparing the 2018 survey estimated sardine biomass to carrying capacity

SWG-PEL Meeting

7th August 2019

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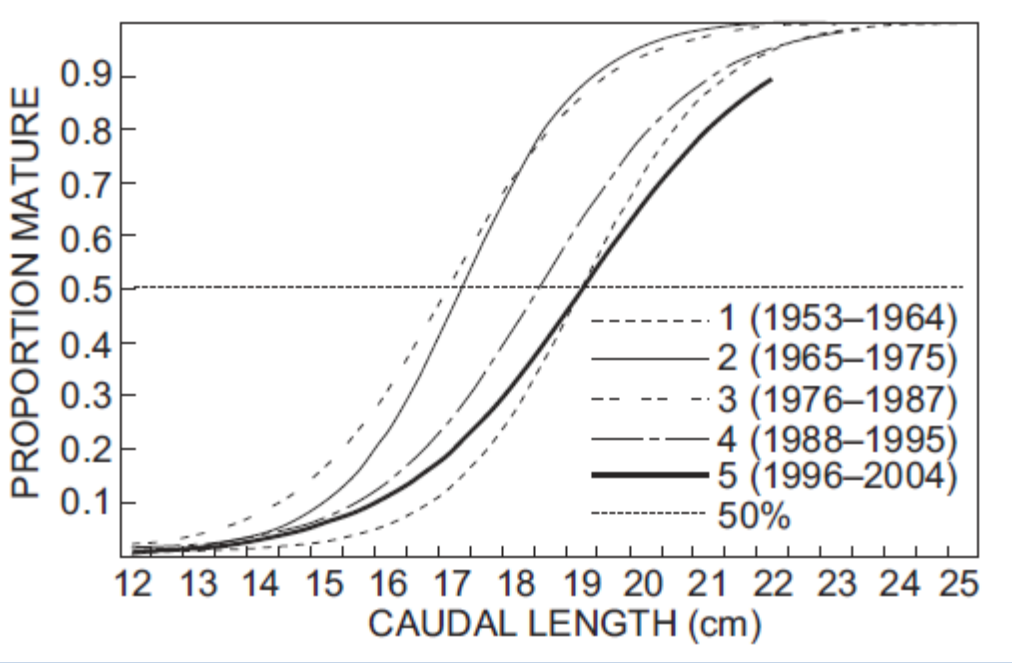
Biomass “currencies”

- Total biomass:

  model estimated biomass (all N x w = B)

- Spawner biomass:

  model estimated biomass contributing to spawning (N x w x f = B^{sp})



van der Lingen *et al.* (2006)

Biomass “currencies”

- Total biomass:

  model estimated biomass (all N x w = B)

- Spawner biomass:

  model estimated biomass contributing to spawning ($N \times w \times f = B^{sp}$)

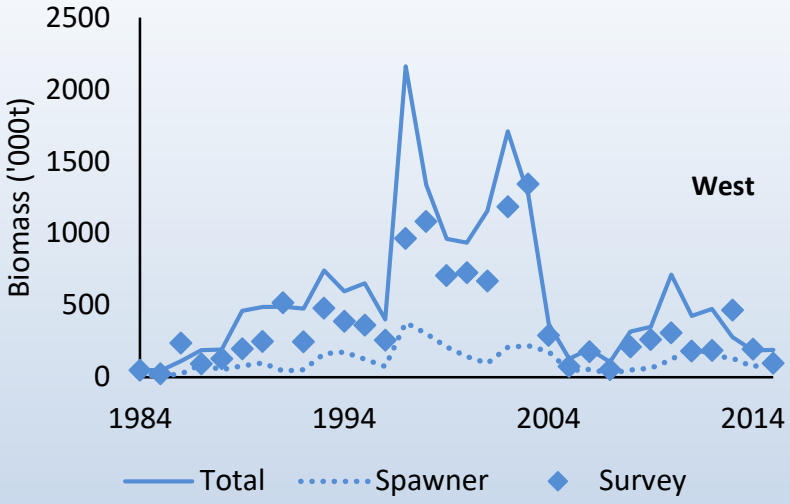
- Effective spawner biomass:

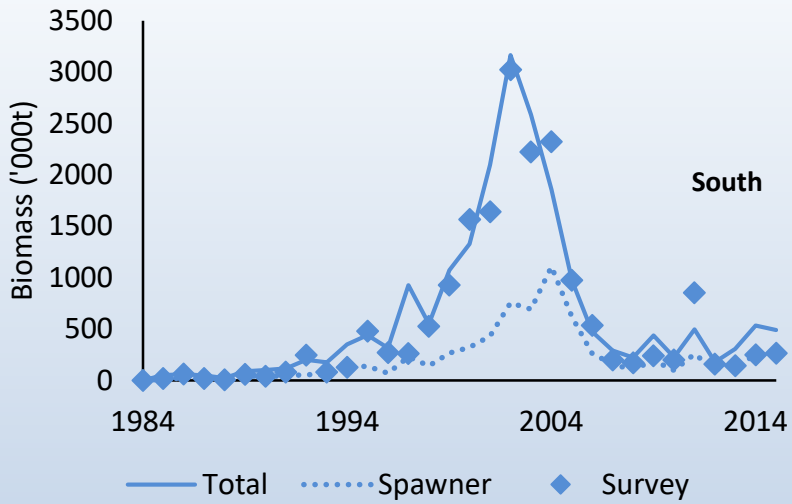
  model estimated biomass on which recruitment to the west/south component is assumed to be dependent

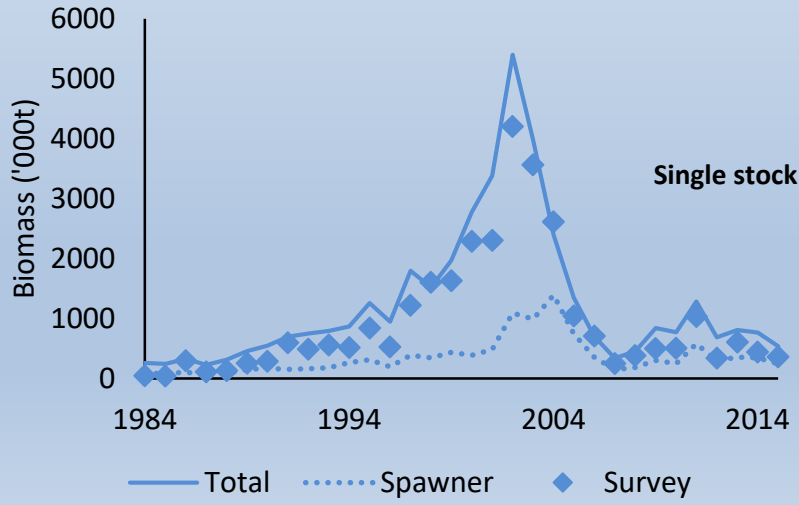
- Survey estimated (“observed”) biomass:

  biomass estimated by the survey; typically an underestimate for sardine ($B^{obs} = k*B$)

Biomass “currencies”

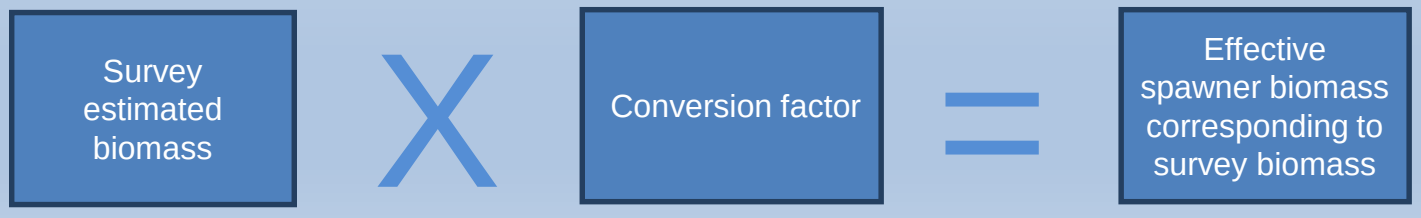






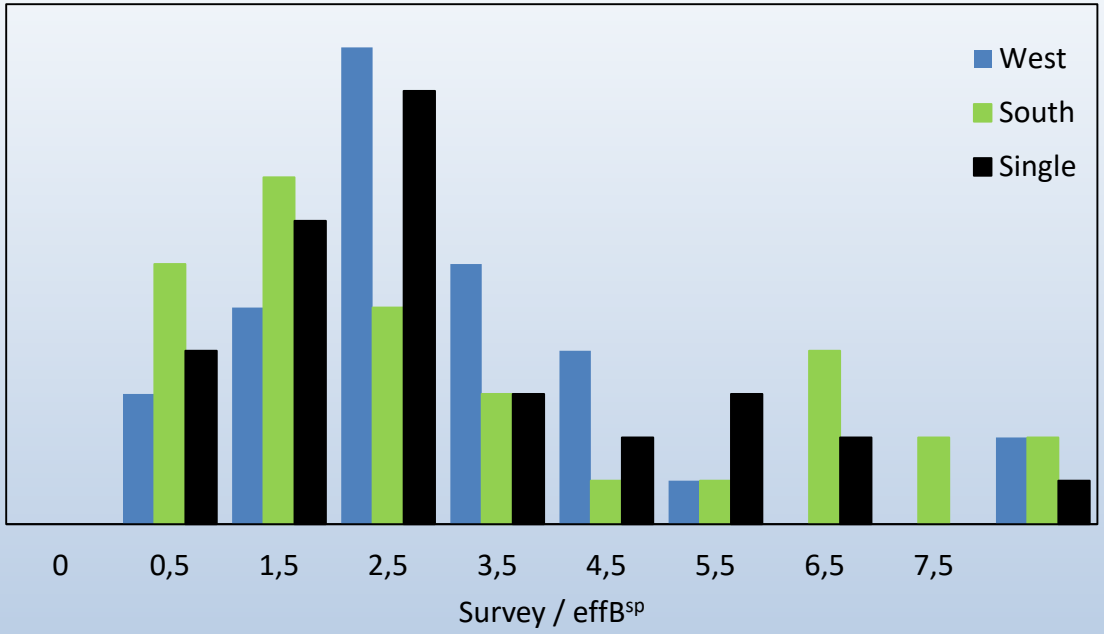
Survey estimated biomass v K

- What did the Nov 2018 survey estimate indicate in terms of the status of the sardine resource relative to carrying capacity (K)?
- Biomass “currency” of K is effective B^{sp}
- Survey estimated biomass must be converted into B^{sp} to compare with K



Conversion factor

- 32 years (1984-2015)
- B^{obs} / posterior median effective B^{sp}



- Median west component conversion factor : 2.58
- Average west component conversion factor : 3.12

Survey estimated biomass v K

	Survey estimate	Median K
• Total survey area:	90 768t	429 460t
• West of Cape Agulhas:	34 845t	353 808t
• East of Cape Agulhas:	55 922t	3 430t

÷ 3.12

÷ 2.58

	Using Average		Using Median	
	$EffB^{Sp}$ corresponding to 2018 survey biomass	Survey estimate : Carrying Capacity	$EffB^{Sp}$ corresponding to 2018 survey biomass	Survey estimate : Carrying Capacity
West	11 155t	0.032	13 528t	0.038
South	14 927t	4.352	24 220t	7.062
Total	37 449t	0.087	45 854t	0.107

In November 2018 sardine west component was 3-4% of K

Survey estimated biomass v K

	Survey estimate	Median K
• Total survey area:	90 768t	429 460t
• West of Cape Agulhas:	(34 845+0.08x55 922)t	353 808t
• East of Cape Agulhas:	(0.92x55 922)t	3 430t

÷ 3.12

÷ 2.58

	Using Average		Using Median	
	$EffB^{Sp}$ corresponding to 2018 survey biomass	Survey estimate : Carrying Capacity	$EffB^{Sp}$ corresponding to 2018 survey biomass	Survey estimate : Carrying Capacity
West	12 587t	0.036	15 265t	0.043
South	13 733t	4.004	22 282t	6.497
Total	37 449t	0.087	45 854t	0.107

In November 2018 sardine west component was 3-4% of K