OMP-18 development: linear smoothing for the sardine HCR
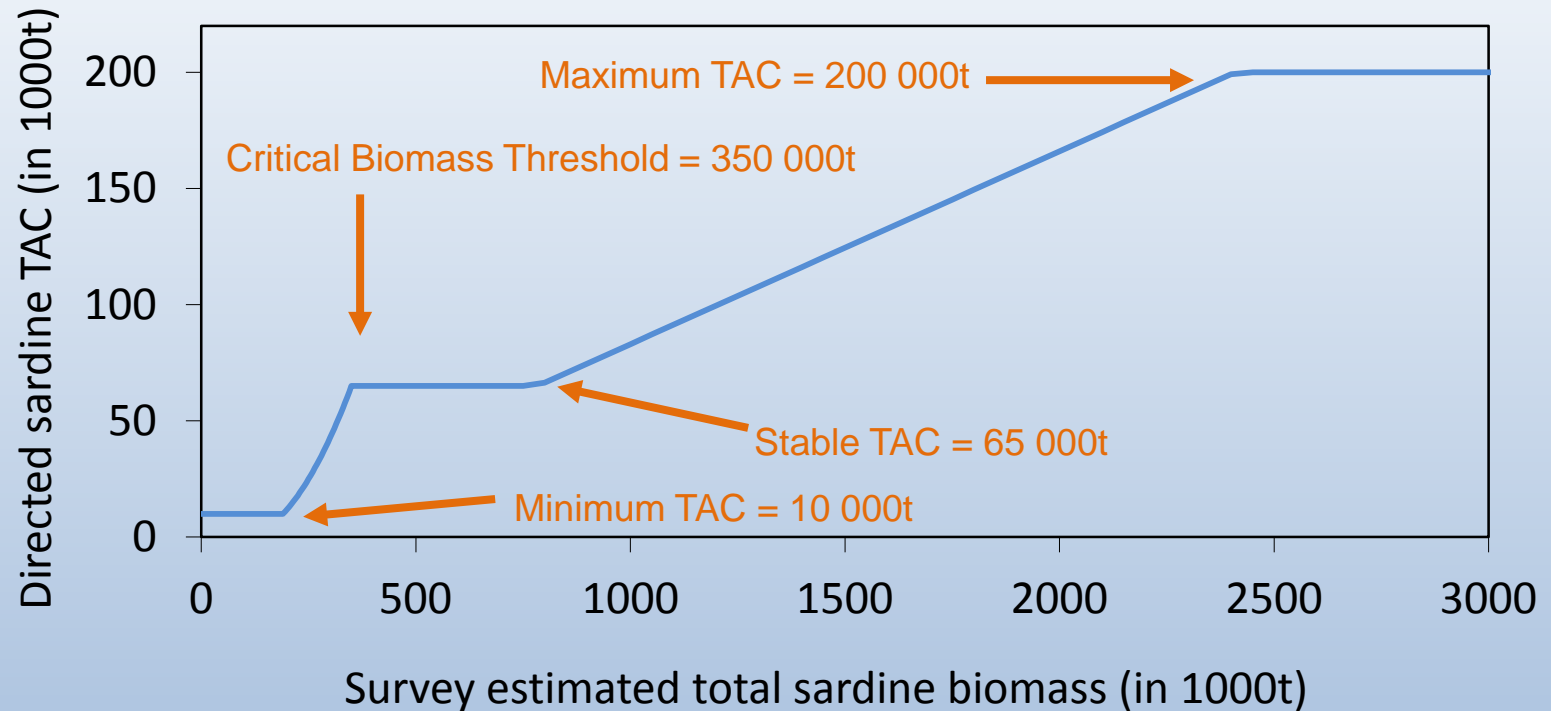
SWG-PEL Meeting
4th July 2018

Carryn de Moor
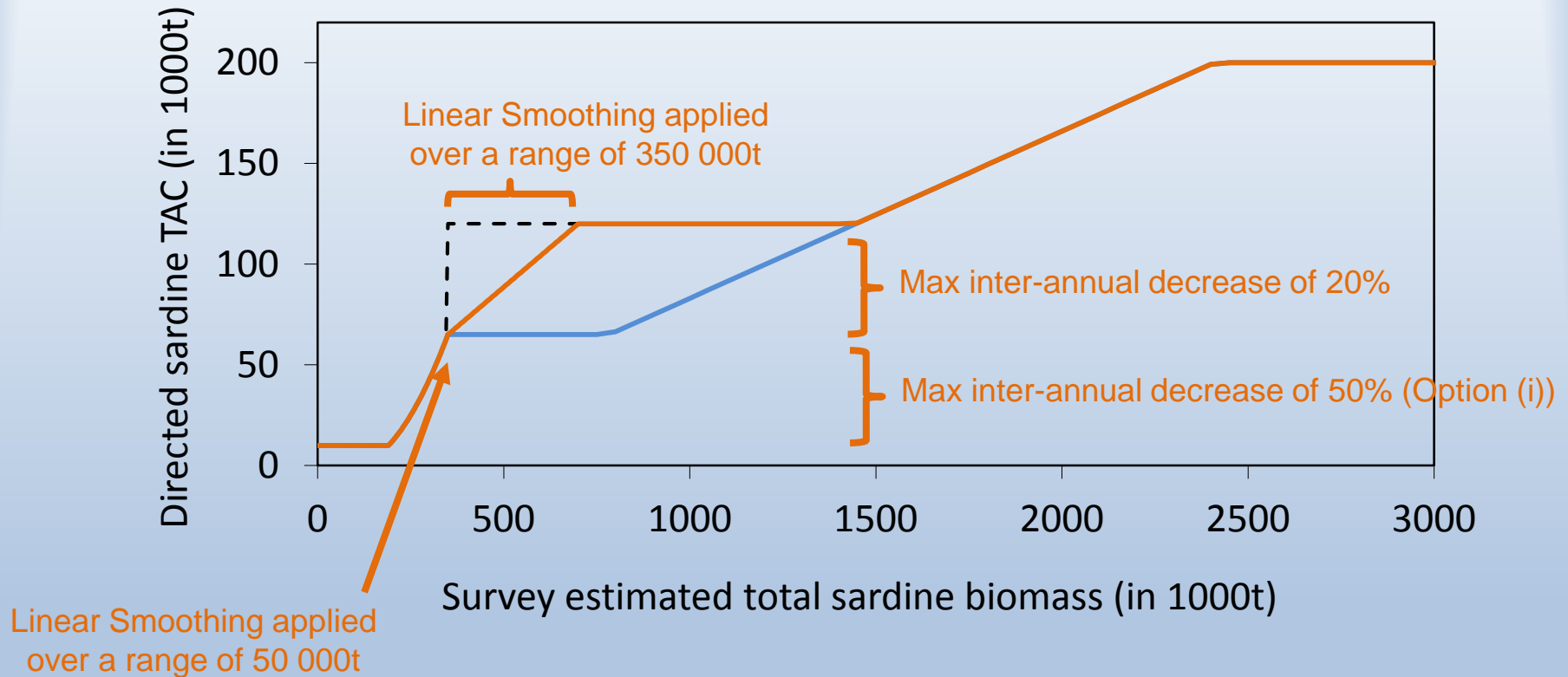
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# Reference Case Sardine HCR

Reference Case Sardine HCR

If TAC_{y-1} = 150 000t, 20% constraint on inter-annual decrease applies:
0.8×150 000t = 120 000t

Linear Smoothing above B$_{crit}$

- Required to avoid discontinuities as B$_{crit}$ is approached, due to different constraints in the HCR above and below B$_{crit}$

- Range of 350 000t or 100 000t

- Reference Case: tuned for "leftward shift" to give $\beta = 0.146$ and risk$_S$ = 0.20 **(rounded!)**

- All alternatives tuned for risk$_S$ < 0.20

Linear Smoothing above B$_{crit}$
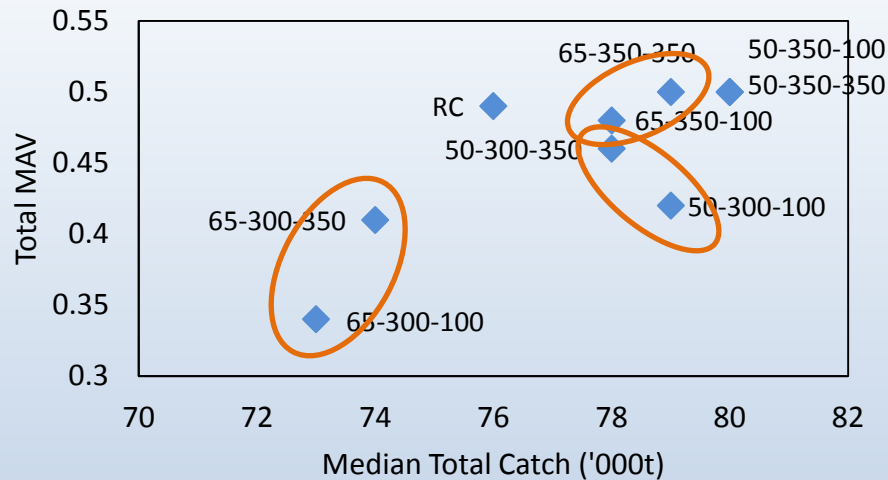
Proportion constraint above B$_{crit}$ = 0.2
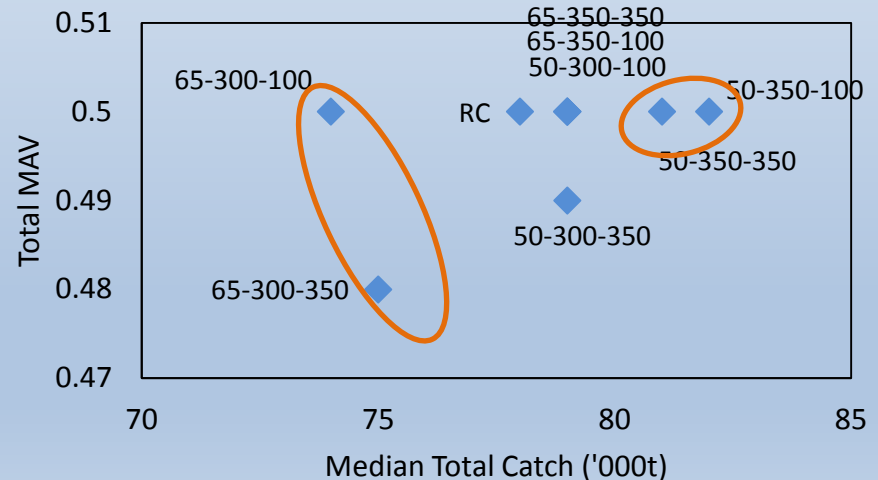
Proportion constraint above B$_{crit}$ = 0.5

Linear Smoothing above B_{crit}

| | 20% constraint when $B_{y-1}^{obs,S} > B_{crit}^S$ | | | | 50% constraint whe... | |
| | $c_{stbl}^S = 65$ | | $c_{stbl}^S = 50$ | | $c_{stbl}^S = 65$ | |
	Average	Median & 90%ile	Average	Median & 90%ile	Average	Median & 90%ile
a) $TAC_{tot}^{S,LS=350} - TAC_{tot}^{S,LS=100}$ — *17-19 000t difference*						
$B_{crit}^S = 350$	-18.9	-19.3 [-38.4,0.0]	-19.1	-19.3 [-39.1,-0.4]	3.6	3.7 [0.3,7.2]
$B_{crit}^S = 300$	-17.0	-17.0 [-38.1,2.1]	-16.8	-17.1 [-36.8,1.0]	1.3	0.0 [-0.4,7.1]
b) $B_{tot,y}^{S,LS=350} - B_{tot,y}^{S,LS=100}$ — *9-11 000t difference*						
$B_{crit}^S = 350$	10.3	10.1 [-3.8,25.8]	11.1	10.9 [-2.3,26.0]	-2.3	-2.2 [-5.2,0.1]
$B_{crit}^S = 300$	9.1	8.5 [-4.4,24.1]	9.1	8.6 [-4.3,24.6]	-0.7	0.0 [-4.4,0.7]
c) $SSB_{w,y}^{S,LS=350} - SSB_{w,y}^{S,LS=100}$ — *2 000t difference*						
$B_{crit}^S = 350$	2.0	1.3 [-0.7,7.1]	2.1	1.3 [-0.5,7.1]	-0.5	-0.3 [-1.7,0.0]
$B_{crit}^S = 300$	1.7	1.1 [-1.0,6.5]	1.7	1.1 [-0.9,6.3]	-0.2	0.0 [-1.2,0.2]

| | 20% constraint when $B_{y-1}^{obs,S} > B_{crit}^S$ | | | | 50% constraint whe... | |
| | $c_{stbl}^S = 65$ | | $c_{stbl}^S = 50$ | | $c_{stbl}^S = 65$ | |
	Average	Median & 90%ile	Average	Median & 90%ile	Average	Median & 90%ile
a) $\left(TAC_{tot}^{S,LS=350} - TAC_{tot}^{S,LS=100} / TAC_{tot}^{S,LS=350}\right)$ — *16-17% difference*						
$B_{crit}^S = 350$	-0.17	-0.17 [-0.33,0.00]	-0.17	-0.16 [-0.33,0.00]	0.04	0.04 [0.00,0.08]
$B_{crit}^S = 300$	-0.16	-0.16 [-0.34,0.02]	-0.16	-0.16 [-0.33,0.01]	0.02	0.00 [0.00,0.08]
b) $\left(B_{tot,y}^{S,LS=350} - B_{tot,y}^{S,LS=100} / B_{tot,y}^{S,LS=350}\right)$						
$B_{crit}^S = 350$	0.02	0.01 [-0.01,0.04]	0.02	0.02 [0.00,0.05]	0.00	0.00 [-0.01,0.00]
$B_{crit}^S = 300$	0.02	0.01 [-0.01,0.05]	0.02	0.01 [-0.01,0.05]		0.00 [-0.01,0.00]
c) $\left(SSB_{w,y}^{S,LS=350} - SSB_{w,y}^{S,LS=100} / SSB_{w,y}^{S,LS=350}\right)$ — *2% difference*						
$B_{crit}^S = 350$	0.02	0.01 [-0.01,0.05]	0.02	0.01 [-0.01,0.05]		0.00 [-0.01,0.00]
$B_{crit}^S = 300$	0.02	0.01 [-0.01,0.05]	0.02	0.01 [-0.01,0.05]		0.00 [-0.01,0.00]

5-7% of cases

Little difference for larger constraint

Linear Smoothing above B$_{crit}$

	$c^S_{stbl} = 65$		$c^S_{stbl} = 50$		$c^S_{stbl} = 65$	
	Average	Median & 90%ile	Average	Median & 90%ile	Average	Median & 90%ile
a) $B^{S,LS=350}_{tot,y} - B^{S,LS=100}_{tot,y}$						
$B^S_{crit} = 350$	1.2	-1.1 [-8.2,19.4]	2.0	-1.2 [-6.7,21.2]	0.0	0.3 [-2.9,1.0]
$B^S_{crit} = 300$	1.5	-0.6 [-7.9,19.1]	1.5	-1.4 [-8.2,19.3]	0.3	0.4 [-0.9,1.1]
b) $SSB^{S,LS=350}_{w,y} - SSB^{S,LS=100}_{w,y}$						
$B^S_{crit} = 350$	0.2	-0.1 [-2.2,3.6]	0.4	-0.1 [-1.8,4.1]	0.0	0.0 [-0.5,0.3]
$B^S_{crit} = 300$	0.2	-0.1 [-2.1,3.7]	0.2	-0.2 [-2.3,4.1]	0.0	0.0 [-0.2,0.3]

	$c^S_{stbl} = 65$		$c^S_{stbl} = 50$		$c^S_{stbl} = 65$	
	Average	Median & 90%ile	Average	Median & 90%ile	Average	Median & 90%ile
a) $\left(B^{S,LS=350}_{tot,y} - B^{S,LS=100}_{tot,y} / B^{S,LS=350}_{tot,y}\right)$						
$B^S_{crit} = 350$	0.00	0.00 [-0.01,0.04]	0.00	0.00 [-0.01,0.04]	0.00	0.00 [0.00,0.00]
$B^S_{crit} = 300$	0.00	0.00 [-0.01,0.04]	0.00	0.00 [-0.01,0.04]	0.00	0.00 [0.00,0.00]
b) $\left(SSB^{S,LS=350}_{w,y} - SSB^{S,LS=100}_{w,y} / SSB^{S,LS=350}_{w,y}\right)$						
$B^S_{crit} = 350$	0.00	0.00 [-0.02,0.05]	0.00	0.00 [-0.02,0.05]	0.00	0.00 [-0.01,0.00]
$B^S_{crit} = 300$	0.01	0.00 [-0.02,0.05]	0.00	0.00 [-0.02,0.05]	0.00	0.00 [0.00,0.00]

Final year of simulations where linear smoothing differs

Recommendation

- Linear Smoothing range of 100 000t is used for OMP-18