MI-WP-07 WCPO Bigeye and Yellowfin TRPs

WCPFC SC20
Manila, Philippines

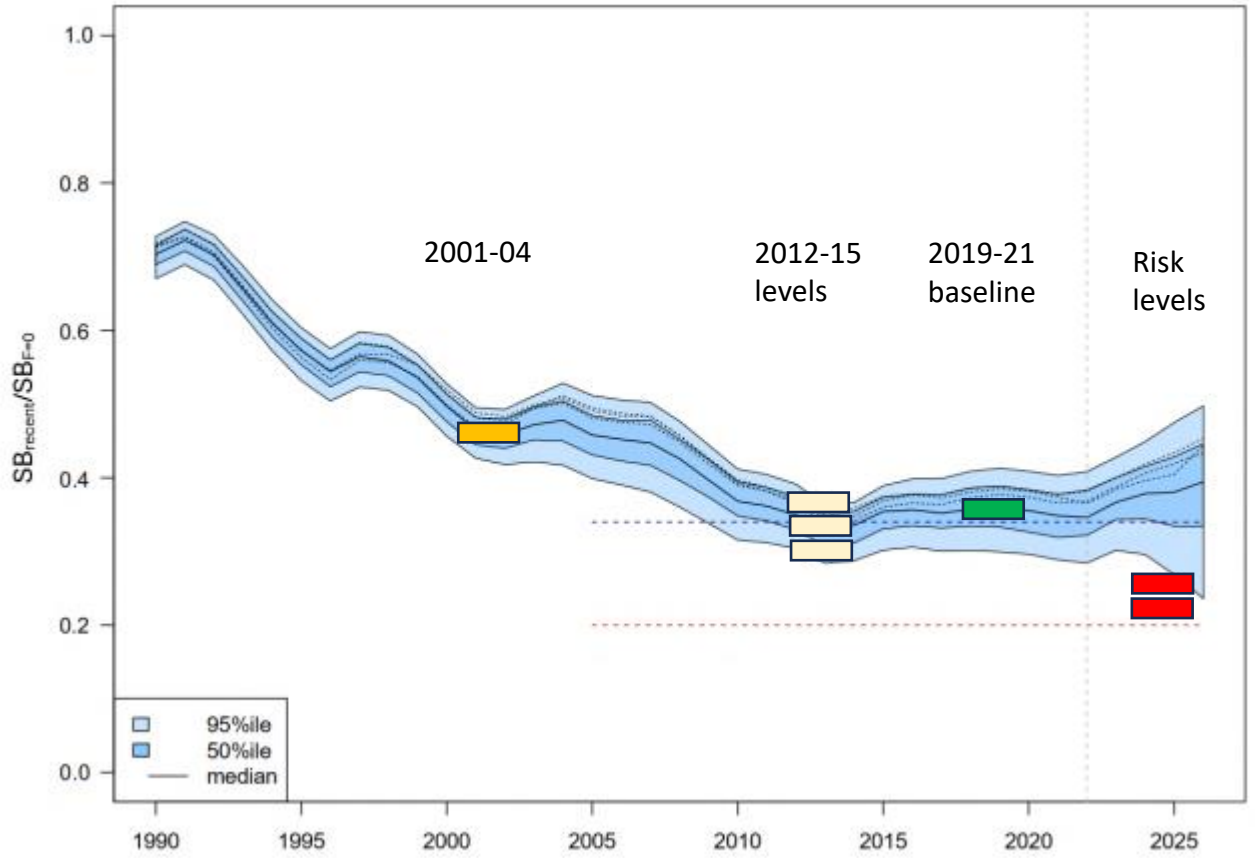
SPC-OFP
14-21 August 2024

Introduction

- WCPFC HS workplan – BET and YFT TRPs to be adopted this year (WCPFC21)
- No clear guidance from managers on levels
  - Exception - comment at WCPFC20 re incorporating FAD closure considerations
- To provide some information, re-ran analyses of WCPFC18-2021-11
  - Used analyses underpinning TT CMM discussions at WCPFC20

Approach

- Projection analyses
- Adjust future fishing to achieve desired candidate depletions in the long term
- BET for two recruitment scenarios



Approach

- TRPs could be achieved with many different balances of PS effort and LL catch
- Two approaches for future fishing levels:
  - As in WCPFC18-2021-11, equal proportional change in PS effort and LL catch cf 2019-2021 levels
  - Incorporate recent CMM decisions
    - Fix PS effort at 2012 levels (CMM 2022-01)
    - Incorporate shortened FAD closure (CMM 2023-01) – for BET only
    - Adjust LL catches to achieve future depletion levels
- Re PS: SKJ and YFT affected by overall effort, BET by effort AND FAD closure
- YFT Region 2 – set to 2016-2018 effort

Results – BET recent recruitment

- Equal proportional change PS/LL

2012-2015 levels
BET: 34%$SB_{F=0}$
YFT: 44%$SB_{F=0}$

BET: recent recruitment						Notes	Equiv. SKJ $SB/SB_{F=0}$ *	Equiv. YFT $SB/SB_{F=0}$ *
Median depletion level ($\%SB_{F=0}$)	Change in SB ($\%SB_{F=0}$) from 2012-2015 average	Change in SB ($\%SB_{F=0}$) from 2018-2021 average	Change in fishing from 2019-2021 levels		Risk $SB/SB_{F=0}$ < LRP			
			Purse seine	Longline				
0.46	+35%	+31%	0%	0%	0%	Base 2019-2021 conditions	53%	41%

Results – BET recent recruitment

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0.34	0%	-3%	+45%	+45%	0%	Avg. 2012-2015	50%	36%
0.37	+9%	+6%	+30%	+30%	0%	Avg. 2012-2015 + 10%	52%	38%
0.32	-6%	-9%	+50%	+50%	1%	Avg. 2012-2015 minus FAD closure	52%	37%

Take 2012-2015 level PS/LL fishing conditions
Calculate impact on PS FAD set multiplier of removing FAD closure (Table 1 effort multiplier)
Identify resulting depletion level
For this table - look at equal PS/LL change needed to achieve that depletion level
Note impact through FADs on BET depletion 'increases' so PS effort change lower – seen in SKJ/YFT results for that row

Results – BET recent recruitment

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0.37	+9%	+6%	+30%	+30%	0%	Avg. 2012-2015 + 10%	52%	38%
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0.34	0%	-3%	+45%	+45%	0%	Avg. 2012-2015	50%	36%
0.37	+9%	+6%	+30%	+30%	0%	Avg. 2012-2015 + 10%	52%	38%
0.32	-6%	-9%	+50%	+50%	1%	Avg. 2012-2015 minus FAD closure	52%	37%
0.46	+35%	+31%	0%	0%	0%	Avg. depletion 2000-04	53%	41%
0.29	-15%	-17%	+65%	+65%	10%	10% risk re LRP	46%	32%
0.26	-24%	-26%	+80%	+80%	20%	20% risk re LRP	45%	30%

- YFT – reductions in catch/effort generally required to achieve depletions

Results – CMM incorporated

- PS effort defined at 2012/shorter FAD closure (BET)
- BET
  - Generally levels achieved with increased LL catches under both recruitment scenarios
  - YFT CMM objective of 2012-2015 avg + not achieved
- YFT
  - Few TRP scenarios are achievable within the range of LL catch multipliers examined (more than 50% reduction or 100% increase in catches)
- SKJ
  - As assuming 2012 PS effort, TRP achieved

Notes

- Using SC-suggested ‘objectives’ – managers have not defined candidate levels
- Challenges in simultaneously achieving current TT CMM objectives across stocks
  - Likely to require trade offs between stock objectives
- ‘Threshold’ TRPs
  - Status needs manager’s clarification
  - ‘target’ achieved on average, limit not exceeded/permissible to exceed with a set risk?
    - E.g. ‘at or above’ could imply a 50% chance of being below that level when ‘at’ the depletion level on average

More notes

- Commission identify the bigeye TRP stock level that achieves desirable outcomes, so that an MP can be designed to achieve it on average?
- Commission identify ‘baseline’ levels for the management procedure (e.g. FAD closure duration, longline catch levels) that will help define the TRP?
- As most of the fisheries taking BET are proposed to be under MP control, anticipated that a single TRP value will represent the level around which the stock should fluctuate.
- Could the yellowfin TRP largely be an emergent property of the other MPs, noting that not all fisheries taking yellowfin will be controlled within the candidate mixed-fishery framework?
- How should the catch of relevant components of ‘other fisheries’ be dealt with within evaluations for yellowfin? For example, in the current analysis they have been set at levels consistent with 2016-18 levels (see CMM 2022-01).

Recommendations

- Discuss the outcomes for bigeye and yellowfin tuna under the different SC16 candidate TRP levels examined.
- Consider whether alternative levels should be considered for WCPFC21.
- Consider the assumptions made for fisheries (baselines, effort/catch) within these evaluations and provide guidance on tractable alternative assumptions.
- Consider how a threshold target reference point may be specified and request further guidance from managers if necessary

BET recent, equal change

BET: recent recruitment									
Median depletion level ($\%SB_{F=0}$)	Change in SB ($\%SB_{F=0}$) from 2012-2015 average	Change in SB ($\%SB_{F=0}$) from 2018-2021 average	Change in fishing from 2019-2021 levels		Risk $SB/SB_{F=0}$ < LRP	Notes	Equiv. SKJ $SB/SB_{F=0}$ *	Equiv. YFT $SB/SB_{F=0}$ *	Equiv. SPA $SB/SB_{F=0}$
			Purse seine	Longline					
0.46	+35%	+31%	0%	0%	0%	Base 2019-2021 conditions	53%	41%	
0.30	-12%	-14%	+60%	+60%	5%	Avg. 2012-2015 – 10%	48%	33%	
0.34	0%	-3%	+45%	+45%	0%	Avg. 2012-2015	50%	36%	
0.37	+9%	+6%	+30%	+30%	0%	Avg. 2012-2015 + 10%	52%	38%	
0.32	-6%	-9%	+50%	+50%	1%	Avg. 2012-2015 minus FAD closure	52%	37%	
0.46	+35%	+31%	0%	0%	0%	Avg. depletion 2000-04	53%	41%	
0.29	-15%	-17%	+65%	+65%	10%	10% risk re LRP	46%	32%	
0.26	-24%	-26%	+80%	+80%	20%	20% risk re LRP	45%	30%	

BET long term, equal change

BET: long-term recruitment									
Median depletion level ($\%SB_{F=0}$)	Change in SB ($\%SB_{F=0}$) from 2012-2015 Average	Change in SB ($\%SB_{F=0}$) from 2018-2021 average	Change in fishing from 2019-2021 levels		Risk $SB/SB_{F=0}$ < LRP	**Notes**	**Equiv. SKJ $SB/SB_{F=0}$***	**Equiv. YFT $SB/SB_{F=0}$***	**Equiv. SPA $SB/SB_{F=0}$**
			Purse seine	Longline					
0.43	+26%	+23%	0%	0%	0%	Base 2019-2021 conditions	53%	41%	
0.30	-12%	-14%	+45%	+45%	16%	Avg. 2012-2015 – 10%	50%	36%	
0.34	0%	-3%	+30%	+30%	3%	Avg. 2012-2015	52%	38%	
0.37	+9%	+6%	+20%	+20%	1%	Avg. 2012-2015 + 10%	53%	40%	
0.32	-6%	-9%	+40%	+40%	10%	Avg. 2012-2015 minus FAD closure	53%	39%	
0.46	+35%	+31%	-10%	-10%	0%	Avg. depletion 2000-04	58%	46%	
0.32	-6%	-9%	+40%	+40%	10%	10% risk re LRP	50%	36%	
0.30	-12%	-14%	+50%	+50%	20%	20% risk re LRP	48%	35%	

YFT, equal change

YFT: long-term recruitment						Notes	Equiv. SKJ $SB/SB_{F=0}$ *	Equiv. BET-R/L $SB/SB_{F=0}$ *	Equiv. SPA $SB/SB_{F=0}$
Median depletion level ($\%SB_{F=0}$)	Change in SB ($\%SB_{F=0}$) from 2012-2015 average	Change in SB ($\%SB_{F=0}$) from 2018-2021 average	Change in fishing from 2019-2021 levels		Risk $SB/SB_{F=0}$ < LRP				
			Purse seine	Longline					
0.41	-7%	-13%	0%	0%	0%	Base 2019-2021 conditions	53%	46%/43%	
0.39	-11%	-17%	+10%	+10%	0%	Avg. 2012-2015 – 10%	52%	41%/38%	
0.44	0%	-6%	-10%	-10%	0%	Avg. 2012-2015	55%	46%/44%	
0.48	+9%	+2%	-30%	-30%	0%	Avg. 2012-2015 + 10%	60%	53%/51%	
0.50	+14%	+6%	-40%	-40%	0%	Avg. depletion 2000-2004	63%	57%/55%	
0.31	-30%	-34%	+50%	+50%	10%	10% risk re LRP	44%	30%/27%	
0.27	-39%	-43%	+70%	+70%	20%	20% risk re LRP	42%	26%/23%	

BET recent, CMM levels

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0.34	0%	-3%	+40%	+50%	0%	Avg. 2012-2015		35%	
0.37	+9%	+6%	+40%	+25%	0%	Avg. 2012-2015 + 10%		37%	
0.32	-6%	-9%	+62%	+50%	1%	Avg. 2012-2015 minus FAD closure		34%	
0.46	+35%	+31%	+40%	-35%	0%	Avg. depletion 2000-04		36%	
0.29	-15%	-17%	+40%	+85%	10%	10% risk re LRP		33%	
0.26	-24%	-26%	+40%	+100	20%	20% risk re LRP		32%	

BET long term, CMM levels

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0.34	0%	-3%	+40%	+25%	2%	Avg. 2012-2015		37%	
0.37	+9%	+6%	+40%	+10%	0%	Avg. 2012-2015 + 10%		38%	
0.32	-6%	-9%	+62%	+25%	8%	Avg. 2012-2015 minus FAD closure		37%	
0.46	+35%	+31%	+40%	-45%	0%	Avg. depletion 2000-04		41%	
0.32	-6%	-9%	+40%	+40%	10%	10% risk re LRP		36%	
0.30	-12%	-14%	+40%	+50%	20%	20% risk re LRP		35%	

YFT, CMM levels

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0.44	0%	-6%	+17%	> -50%	0%	Avg. 2012-2015		-/-	
0.48	+9%	+2%	+17%	> -50%	0%	Avg. 2012-2015 + 10%		-/-	
0.50	+14%	+6%	+17%	> -50%	0%	Avg. depletion 2000-2004		-/-	
-*	-	-	+17%	> +100%	10%	10% risk re LRP		-/-	
-*	-	-	+17%	> +100%	20%	20% risk re LRP		-/-	