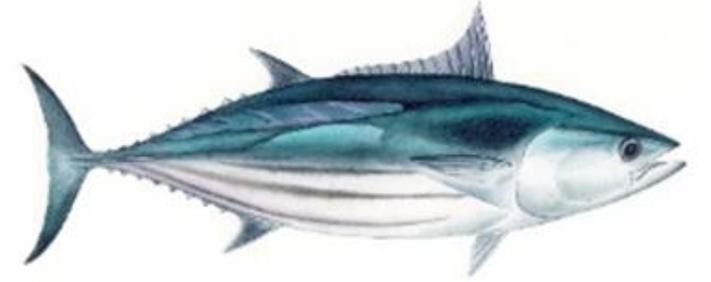


Evaluations of candidate management procedures for skipjack tuna in the WCPO

WCPFC-SC17-2021/MI-WP-04

OCEANIC FISHERIES PROGRAMME, SPC

SKIPJACK



Key outcomes

- All components of the Skipjack MSE model now updated for the 2019 assessment, tested and suitable for progressing formal evaluation studies
- Proposed **monitoring strategy** needs refining including any **CCM specific performance indicators** that cannot be derived directly from the MSE framework.
- Ongoing work to further develop elements of the **robustness set**.
- Presentation of results
- **SC17-MI-WP-04**
 - Basis of the skipjack Management Procedure is outlined in **Appendix A**
 - Assumptions regarding the implementation of archipelagic waters detailed in **Appendix B**
 - Evaluation software and input data repository described in **Appendix C**

Skipjack



2020
achieved

- Updated SKJ MSE model framework
- Re-run trial MP evaluations
- Develop monitoring procedure

2021

- Continue to refine MSE models
- Formal evaluations of candidate MPs

2022

Adopt MP

SKIPJACK MSE UNCERTAINTY GRID



Axis	Levels	Options		
	Reference	0	1	2
Recruitment variability	2	1982-2014	2005-2014	
Catch & effort	1	20%		
Size composition	1	Estimated ESS		
Tag recaptures	1	Status quo		
Steepness	3	0.8	0.65	0.95
Mixing period	2	1 qtr	2 qtr	
Growth	2		Low	High
Movement	1	Estimated		
Hyper-stability in CPUE	2	0	-0.5	
Effort creep	2	0%	2%	

96 scenarios

10 iterations each scenario

960 evaluations for each HCR

SKIPJACK MSE – HCRS

First projection year 2019
 First year MP run 2022
 First time HCR applies 2023

Interim period (2019-2022) average 2016-18

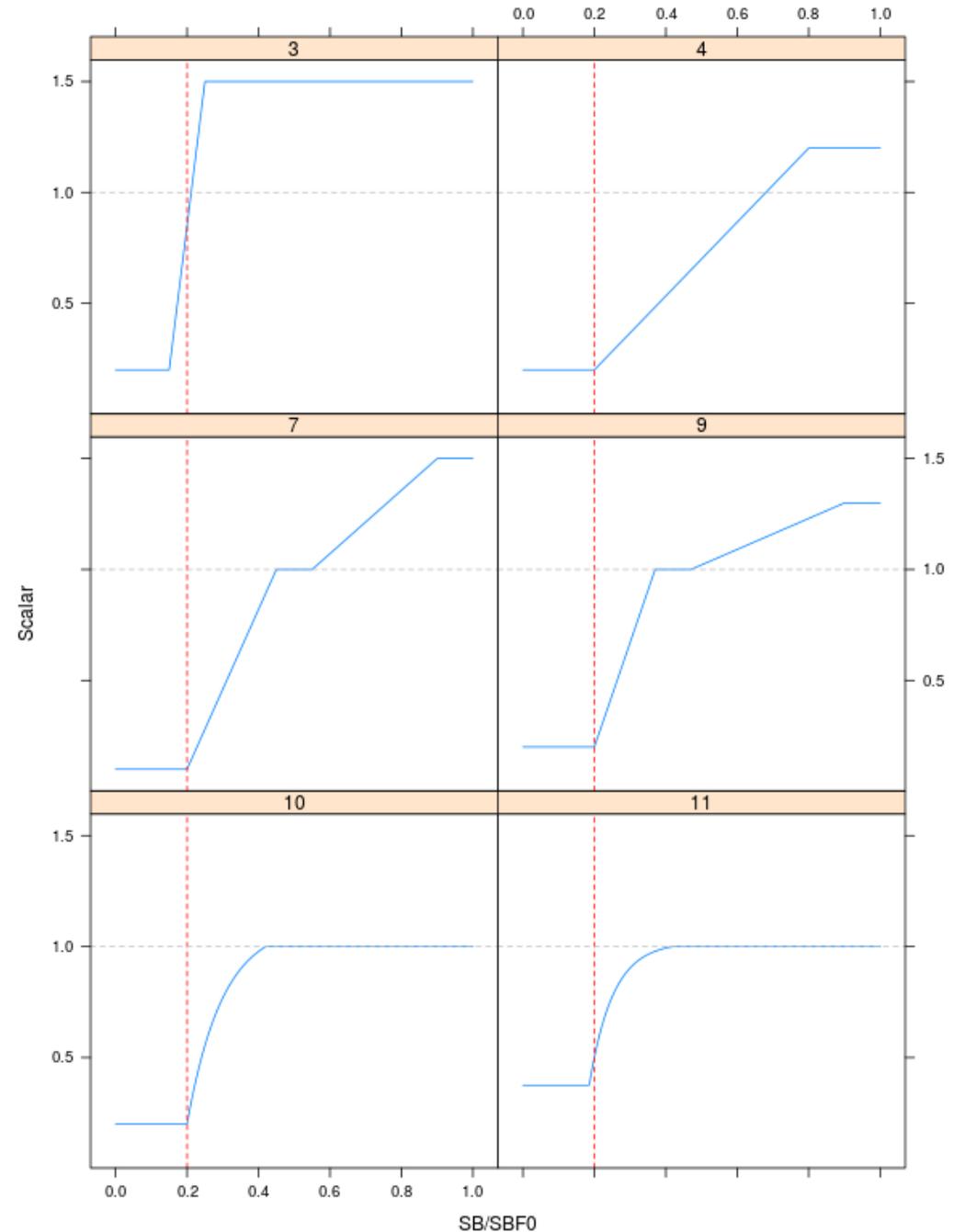
Projection period 30 years
 Management period 3 years

TRP SB/SB_{F=0} (2012)

Reference catch/effort year **2012**

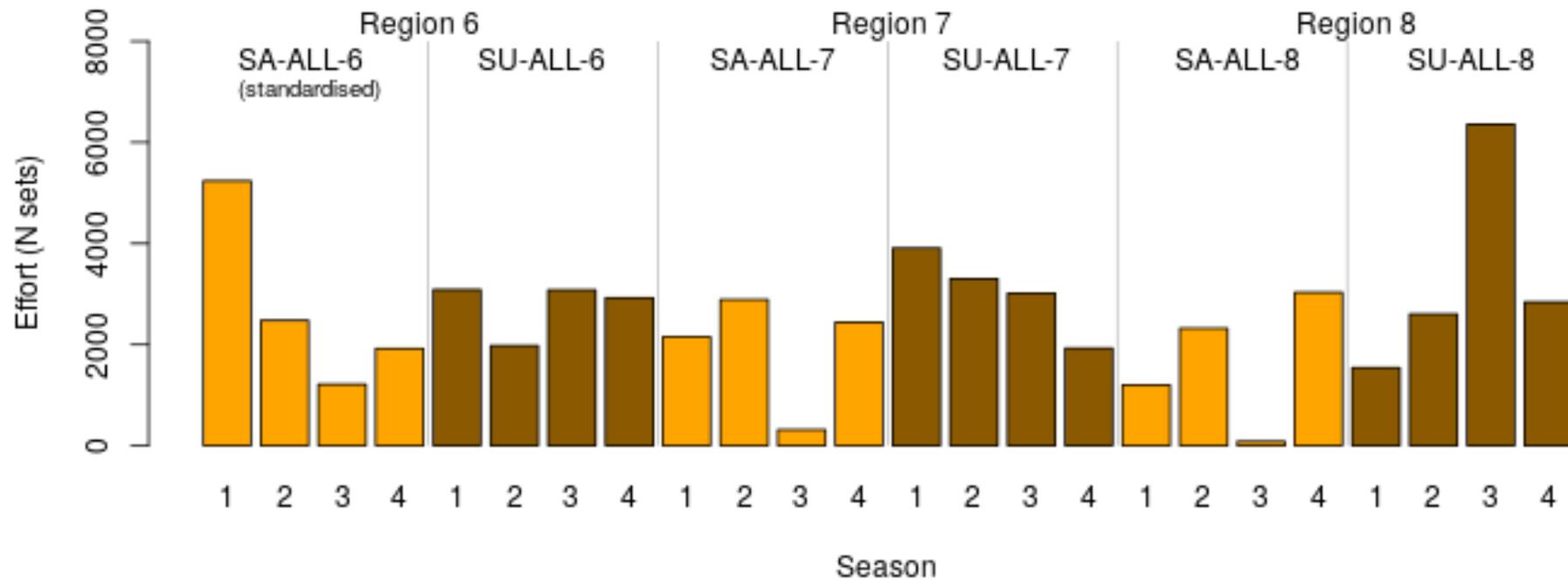
HCR fisheries **All**
 effort
 catch
 catch

Archipelagic waters **fixed at 2012**



SKIPJACK MSE – BASIS OF THE HCR

Seasonal pattern of tropical purse seine effort during the reference year : 2012

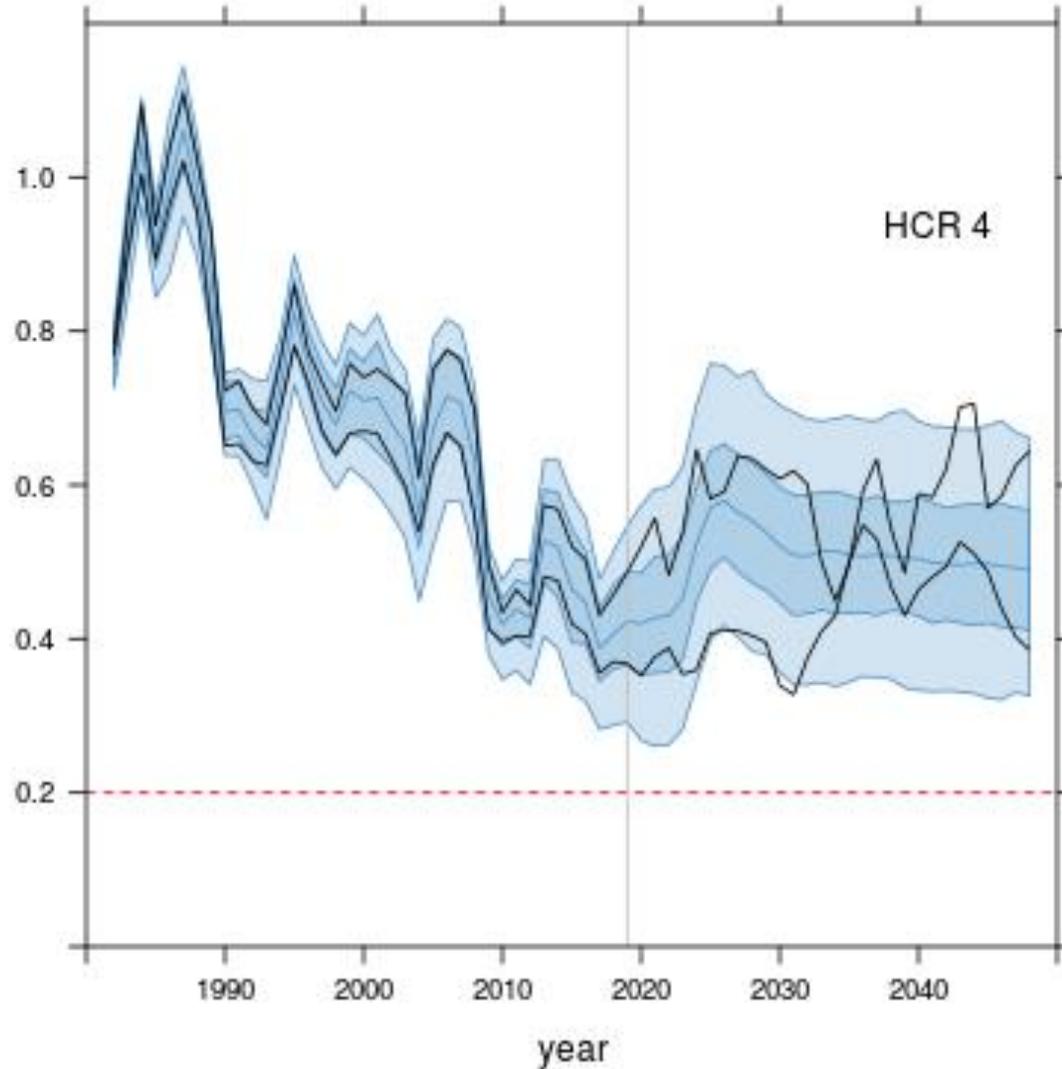
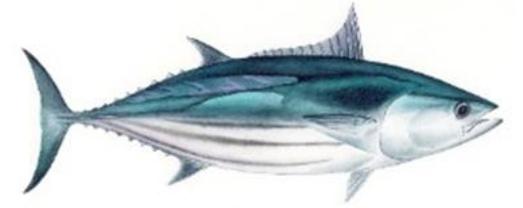


SKIPJACK MSE – PERFORMANCE INDICATORS

- Performance Indicator 1: Maintain SKJ, YFT, BET biomass at or above levels that provide fishery sustainability throughout their range.
- Performance Indicator 3: Maximise economic yield from the fishery (average expected catch).
- Performance Indicator 4: Maintain acceptable CPUE.
- Performance Indicator 6: Catch stability.
- Performance Indicator 7: Stability and continuity of market supply (effort variation relative to a reference period).
- Performance Indicator 8: Stability and continuity of market supply (probability of and deviation from $SB/SB_{F=0}$ in 2012).

Performance Indicators 5, 9, 10 & 11 continue to be developed

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The presentation of results as a distribution for all 960 evaluations can mask the annual variability in individual runs.

On average stock status will be expected to be around the target, but will not always be at the target.

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<https://ofp-sam.shinyapps.io/pimple/>

← → ↻ 🏠 ofp-sam.shinyapps.io/pimple/ 🔍 ☆ ⚙️ ● ⋮

Performance Indicators and Management Procedures Explorer Introduction Compare performance Explore indicators Management procedures Majuro and Kobe plots About



HCR selection

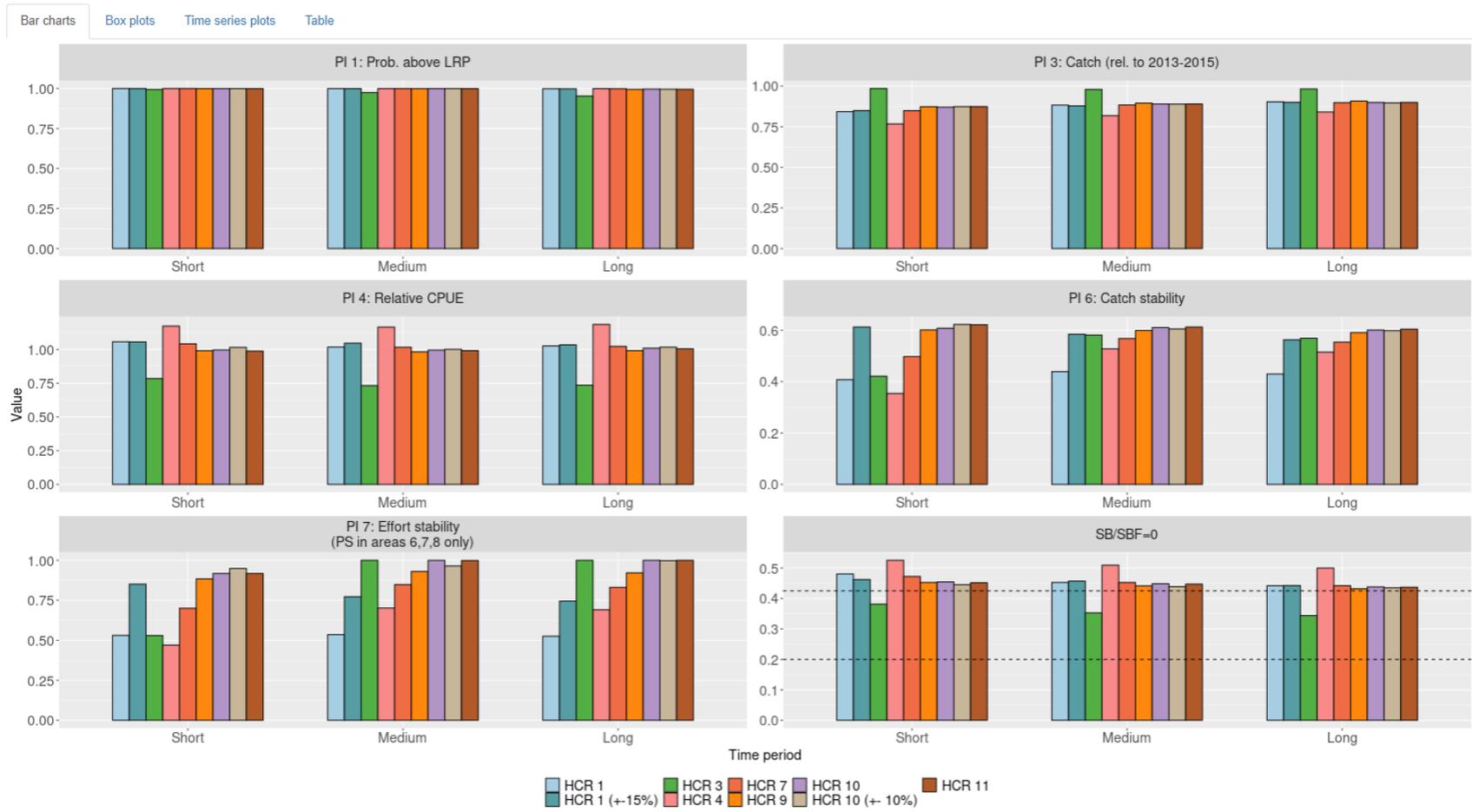
- HCR 1
- HCR 1 (+-15% limit)
- HCR 3
- HCR 4
- HCR 7
- HCR 9
- HCR 10
- HCR 10 (+-10% limit)
- HCR 11

PI selection

- SB/SBF=0
- PI 1: Prob. above LRP
- PI 3: Catch (rel. to 2013-2015)
- PI 4: Relative CPUE
- PI 6: Catch stability
- PI 7: Effort stability
- PI 8: Proximity to SB/SBF=0 (2012)

Catch grouping (PIs 3 & 6 only)

All areas



Short-term is: 2022-2030, medium-term is: 2031-2039 and long-term is: 2040-2048.

Note that PIs 4 and 7 are for the purse seines in model areas 2, 3 and 5 only (excluding the associated purse seines in area 5.)

SKIPJACK HARVEST STRATEGY – SC17

- Ongoing work
 - Monitoring Strategy; Robustness Set; remaining Performance Indicators.
- Feedback and advice from SC17:
 - Input into Management Procedure and Harvest Control Rule designs.
 - Feedback on presentation approaches to enhance decision making.
 - How should advice on the scientific aspects of Harvest Control Rules be delivered to managers?
- Feedback, advice and direction from the Commission:
 - Definition of fisheries and fishery controls within the harvest strategy.
 - Input into Management Procedure and Harvest Control Rule designs.
 - Feedback on presentation approaches to enhance decision making.
 - Procedures for selecting the “best” Management Procedure.



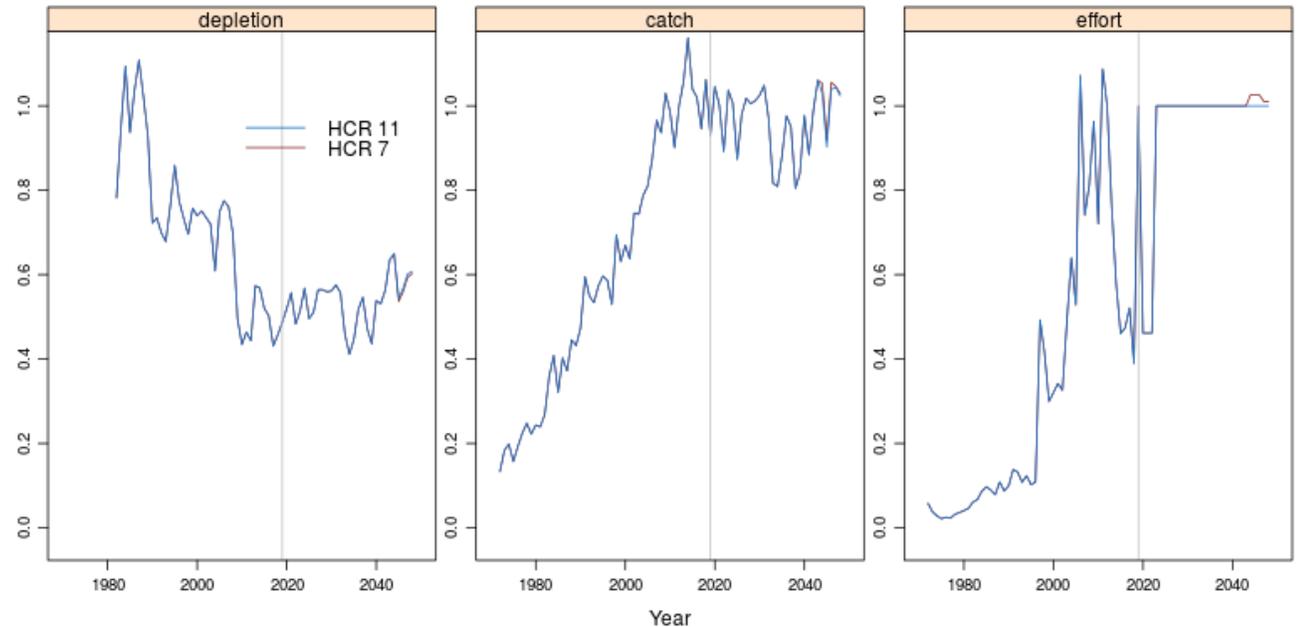
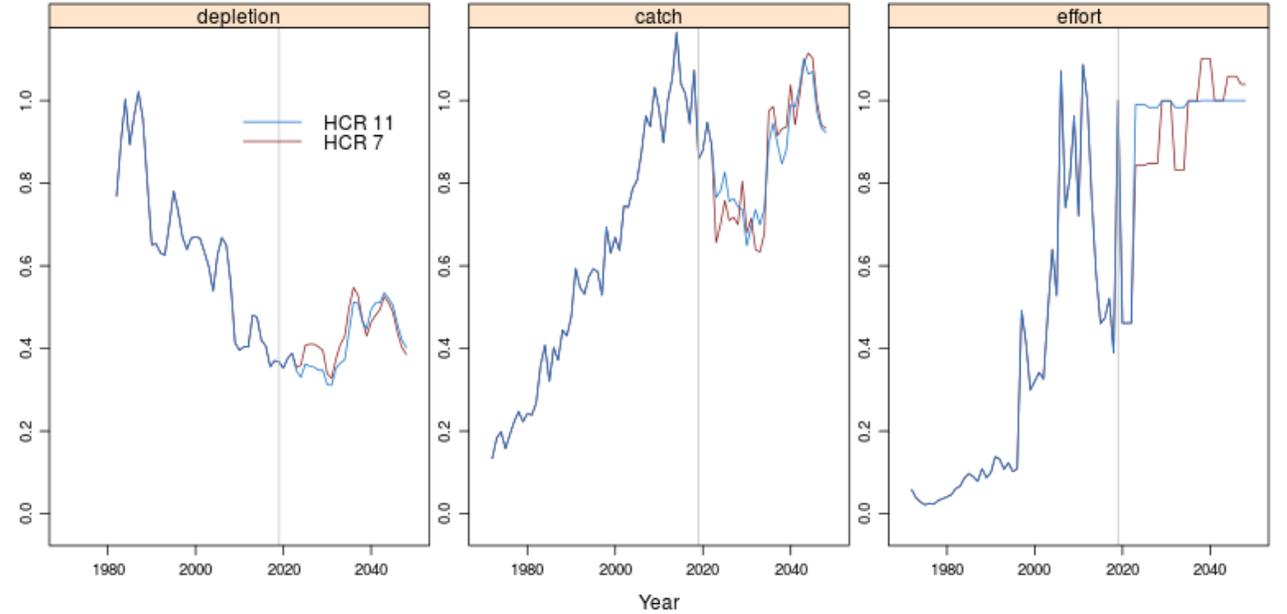
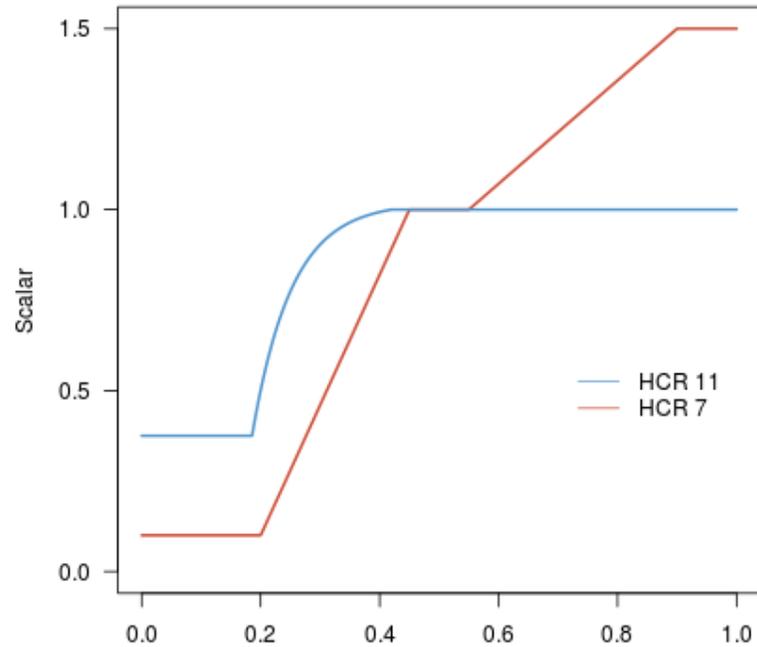
Pacific
Community
Communauté
du Pacifique

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Single iteration comparison for HCRs 7 and 11

Very similar results for stock status and catch, but more stable effort with HCR 11

For this iteration



SKIPJACK

Single iteration comparison for HCRs 7 and 11

Very similar results for stock status and catch, but more stable effort with HCR 11

For this iteration

