A theoretical Blue Shark Management Strategy Evaluation for South

PRELIMINARY

Global BSH MSE Workshop
Rome, Italy – October 2025

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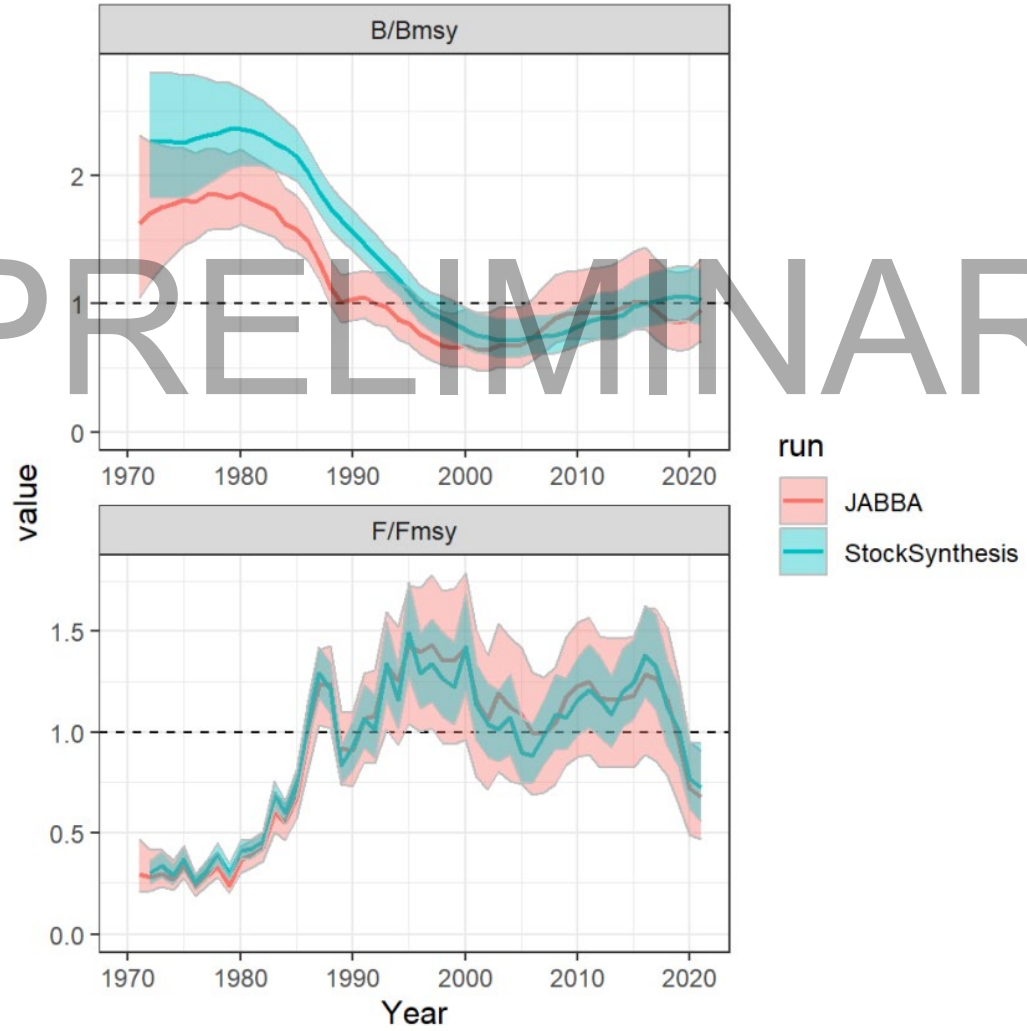
Stock Overview: southern Blue Shark



Candidate Southern Atlantic Blue Shark Management Procedures

- Candidate Management Procedures evaluated in MSE (main properties too)
  - LstepCAL — a custom length-based procedure (mainly for curiosity)
  - Emp1* — first variant of EMP, delta up and down of 0.1
  - Emp2 — first variant of EMP, delta up and down of 0.3
  - Emp3 — this was our exploration of averaging across two specific CPUE series (Spain and Japan LL i.e., set formals(Emp4)$Inds <- c(1,2))
  - SSS_75MSY — an exploration of Simple Stock Synthesis
  - Spict1** — surplus production that included the Cortes and Taylor prior on r, MaxChange=0.5
  - Spict2** — spict 1 with MaxChange=1
  - SCA_MSY — what if we had catch at age data?

**If Ind_fac=NA, the fraction of defaults to perfectly known mean (0.75 * FMSY)/last_historical_F) - mean over simulations. i.e. EMP1 it is not really an MP (Carmen)*
*** missing parentheses (Gonzalo)*

Performance Metrics

- Status
- Safety
- P100
- PNOF
- Catch ST
- Catch LT
- Average annual variability in yield (AAVY)*
- *to ensure probability statistics are coherently interpretable (i.e. high is good, low is bad) AAVY is expressed as P(AAVY>reference level) where the reference level is 0.2

Table of summary PM values for the CMPs evaluated in the MSE (base)

	Status	Safety	P100	PNOF	Catch_ST	Catch_LT	AAVY
	All	All	All	All	All	All	All
SSS_75MSY	1	1	1	1	13700	12700	1
Emp1	0.889	1	0.894	0.981	17300	18300	1
SCA_MSY	0.786	0.992	0.861	0.878	17700	17700	0.75
LstepCAL	0.569	0.833	0.653	0.578	20000	15200	0.75
Emp3	0.325	0.944	0.575	0.478	21200	18000	1
Spict2	0.264	1	0.347	0.567	22700	17800	1
Spict1	0.256	1	0.378	0.511	23600	17100	1
Emp2	0.192	0.992	0.503	0.325	22200	18600	1

Breakout Session Part 3

Alternative OMs: Reference and Robustness

Atlantic South - Alternative OMs

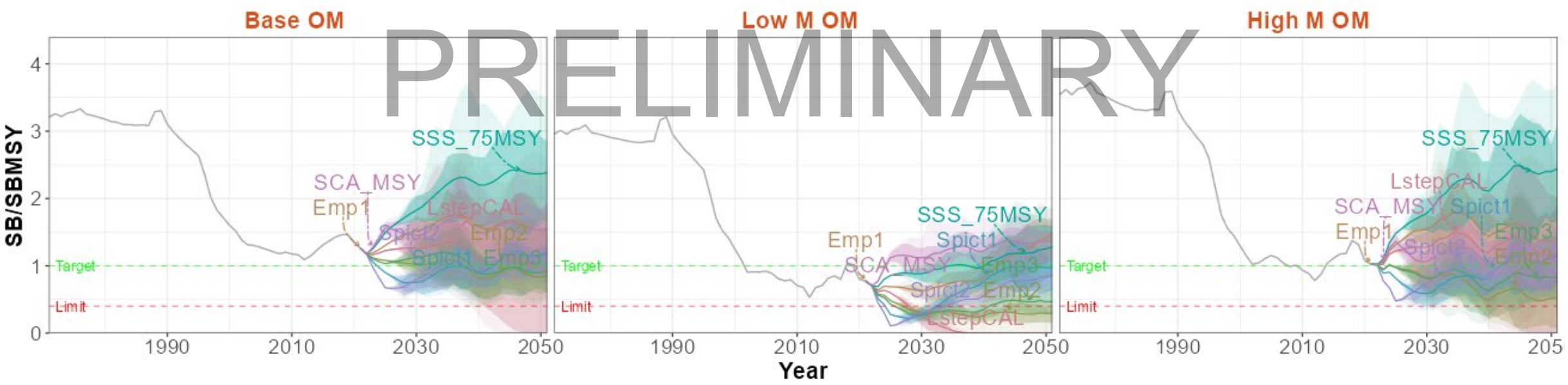
Key uncertainties

- We just constrained our exploration of alternative OMs to the high M (delta <- 1.2) and low M (delta <- 0.8) scenario

Candidate MP Performance

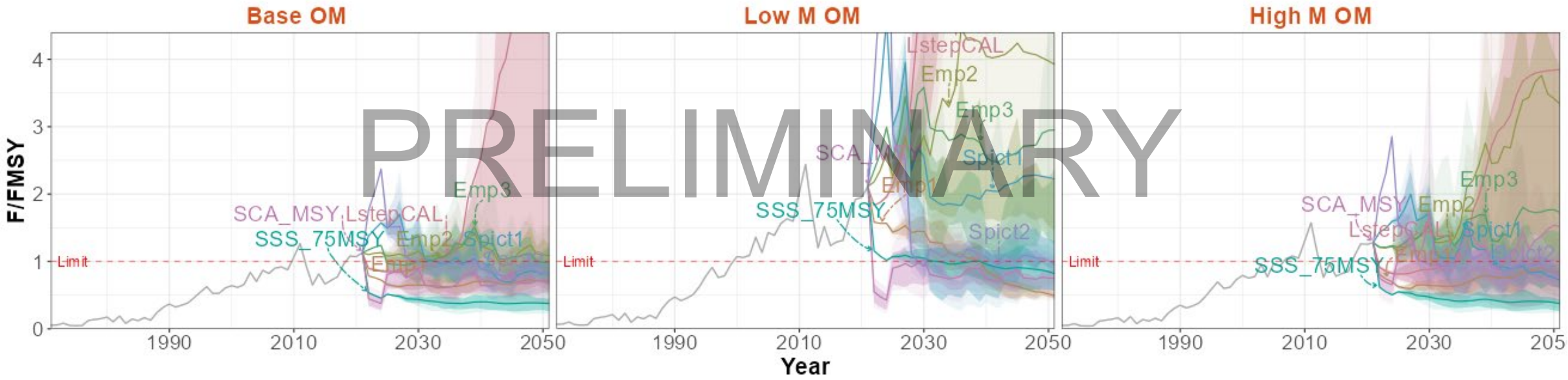
Time Series Plots - Biomass

[add any necessary supplemental info: (e.g., Median values over 20-year projection (2020-2040))]



Candidate MP Performance

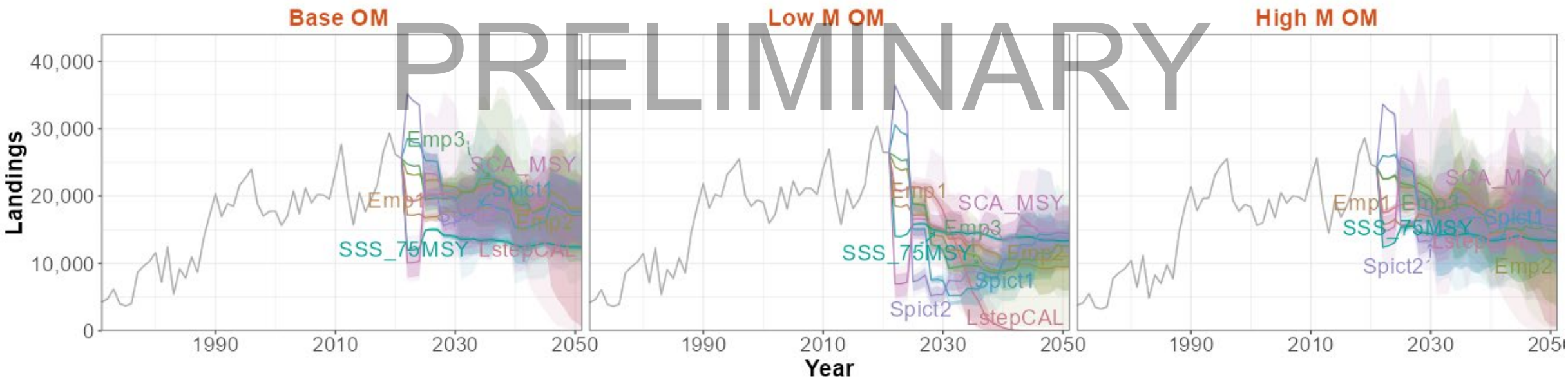
Time Series Plots – F/FMSY – a very useful diagnostic criterion in defining which MPs are failing to provide adequate feedback control on F



Candidate MP Performance

Time Series Plots - Yield

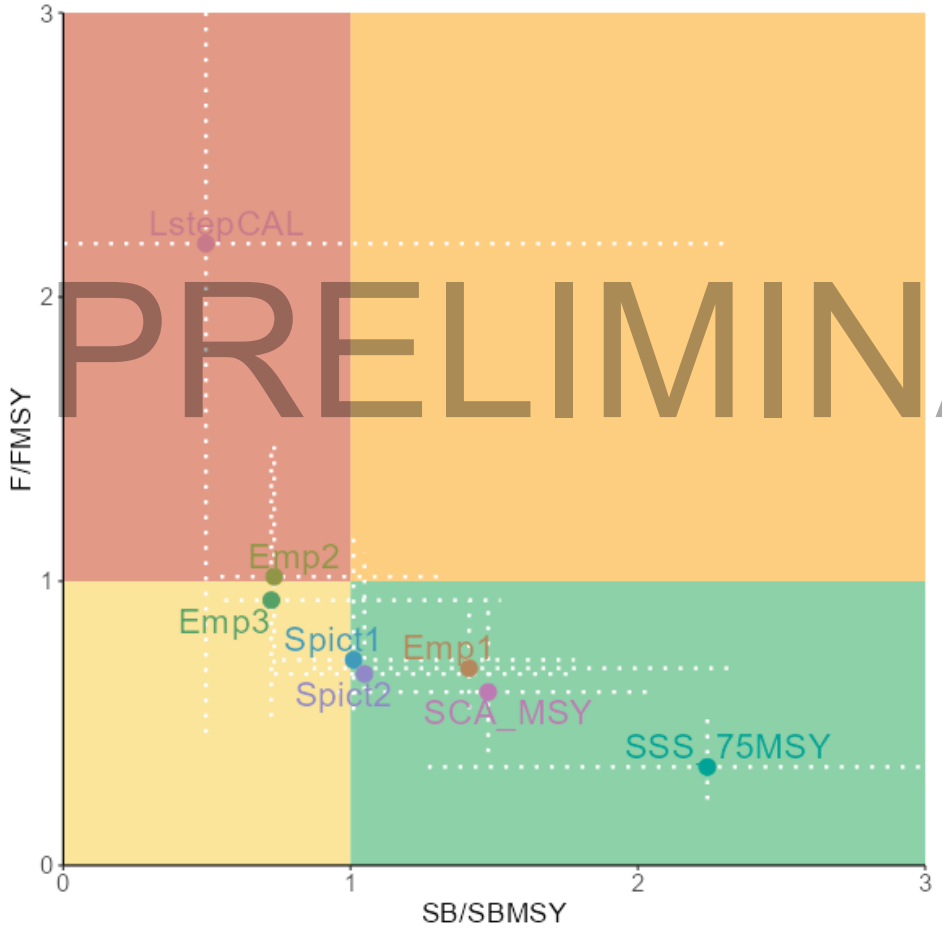
[add any necessary supplemental info: (e.g., Median values over 20-year projection (2020-2040))]



Candidate MP Performance

Kobe Plot

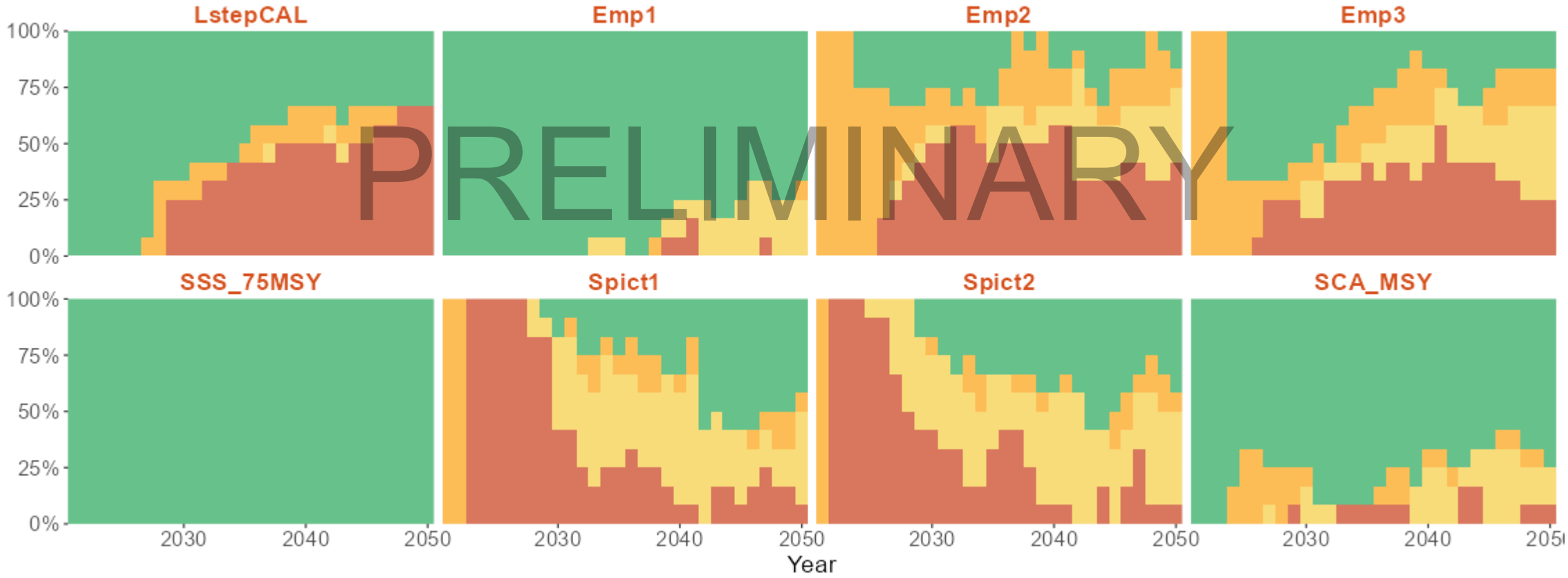
Base



Candidate MP Performance

Kobe Time Plot

[add any necessary supplemental info]



Candidate MP Performance

Quilt Table

	Status	Safety	P100	PNOF	Catch_ST	Catch_LT	AAVY
	All	All	All	All	All	All	All
SSS_75MSY	1	1	1	1	13700	12700	1
Emp1	0.889	1	0.894	0.981	17300	18300	1
SCA_MSY	0.786	0.992	0.861	0.878	17700	17700	0.75
LstepCAL	0.569	0.833	0.653	0.578	20000	15200	0.75
Emp3	0.325	0.944	0.575	0.478	21200	18000	1
Spict2	0.264	1	0.347	0.567	22700	17800	1
Spict1	0.256	1	0.378	0.511	23600	17100	1
Emp2	0.192	0.992	0.503	0.325	22200	18600	1

Base

Key Results and Consideration: we wouldn´t choose any of these MPs

Reference case

	Status	Safety	Catch_LT	AAVY
SSS_75MSY	1	1	12700	1
~~Emp1~~	0.889	1	18300	1
~~SCA_MSY~~	0.786	0.992	17700	0.75
LstepCAL	0.569	0.833	15200	0.75
Emp3	0.325	0.944	18000	1
Spict2	0.264	1	17800	1
Spict1	0.256	1	17100	1
Emp2	0.192	0.992	18600	1

High M

	Status	Safety	Catch_LT	AAVY
SSS_75MSY	0.997	1	13600	1
~~Emp1~~	0.825	1	18700	1
LstepCAL	0.611	0.836	13100	0.75
~~SCA_MSY~~	0.528	0.925	17400	0.333
Spict1	0.231	0.914	15900	0.917
Spict2	0.214	0.975	17000	0.917
Emp3	0.181	0.819	15100	0.917
Emp2	0.0889	0.761	13500	0.833

Low M

	Status	Safety	Catch_LT	AAVY
~~SCA_MSY~~	0.597	0.994	14800	0.833
SSS_75MSY	0.353	0.994	13600	1
~~Emp1~~	0.294	0.978	10700	1
Spict1	0.119	0.686	13600	0.75
Spict2	0.0361	0.639	13200	0.25
Emp3	0.0139	0.419	11300	0.917
LstepCAL	0	0.231	20	0
Emp2	0	0.392	9530	0.833

All

	Status	Safety	Catch_LT	AAVY
SSS_75MSY	0.783	0.998	13300	1
~~Emp1~~	0.669	0.993	15900	1
~~SCA_MSY~~	0.637	0.97	16600	0.639
LstepCAL	0.394	0.633	9440	0.5
Spict1	0.202	0.867	15500	0.889
Emp3	0.173	0.728	14800	0.944
Spict2	0.171	0.871	16000	0.722
Emp2	0.0935	0.715	13900	0.889

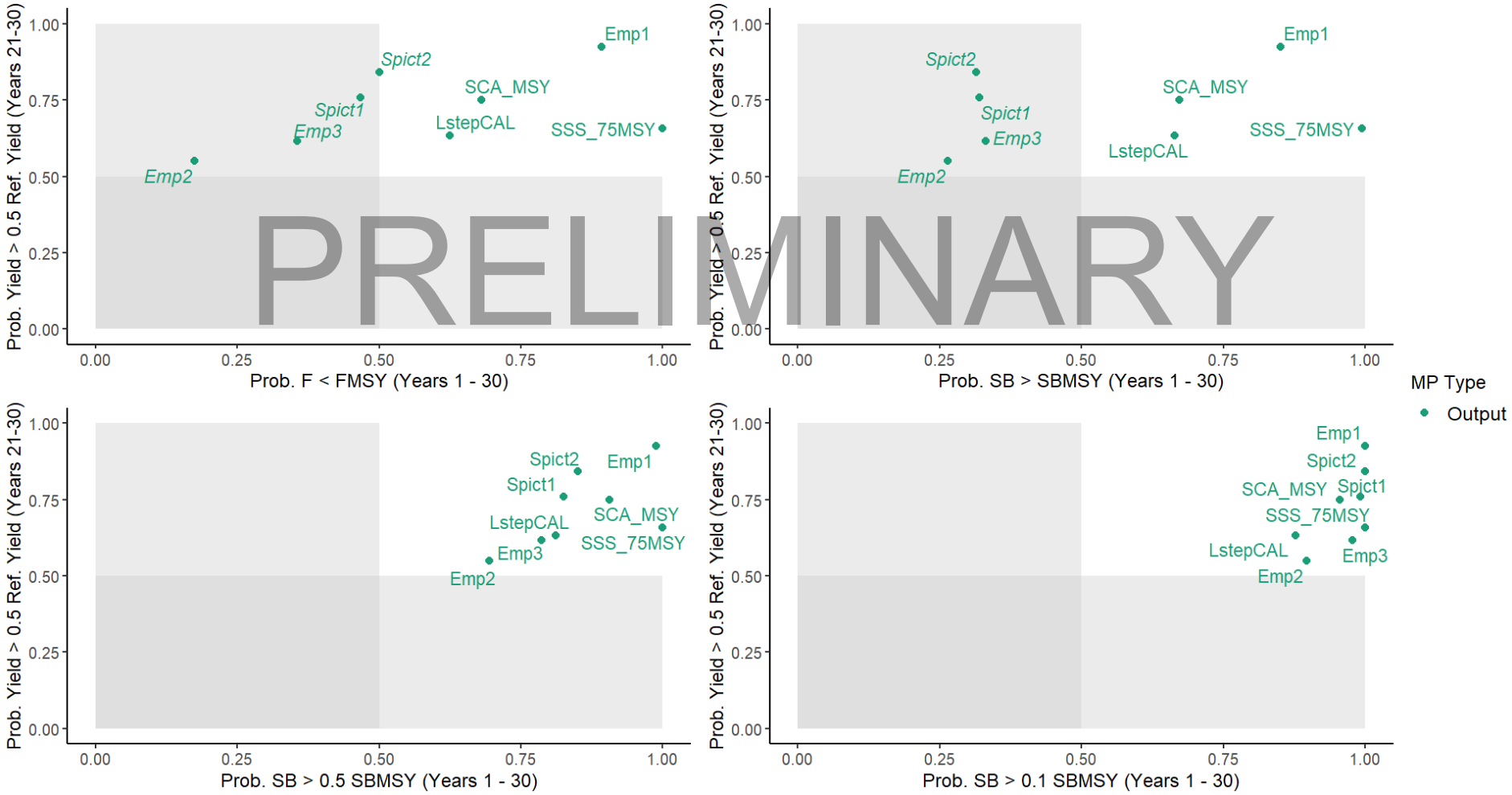
Draft Workplan

- *Discussed by Rui this morning*

PRELIMINARY

Candidate MP Performance

Trade-off Plot



Questions from the group?