



# Progress of Operating Model development and preliminary MSE results for SKJ & YFT

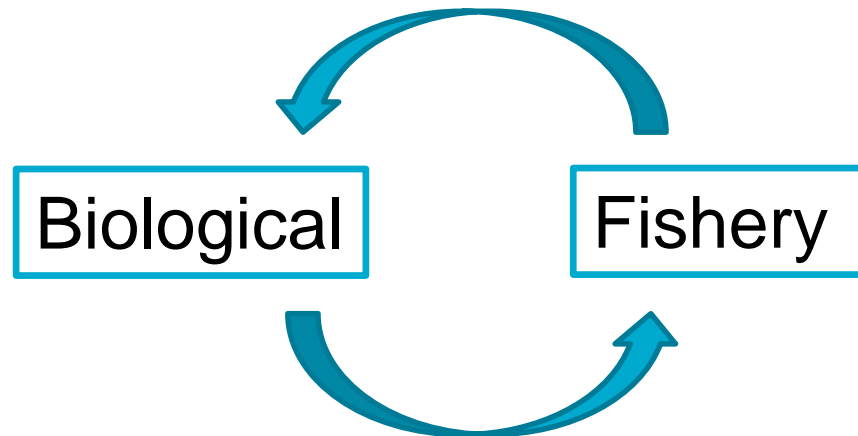
Eriko Hoshino, Richard Hillary, Campbell Davies, Craig Proctor  
Stakeholder Workshop, Bogor, 22-23 November, 2018

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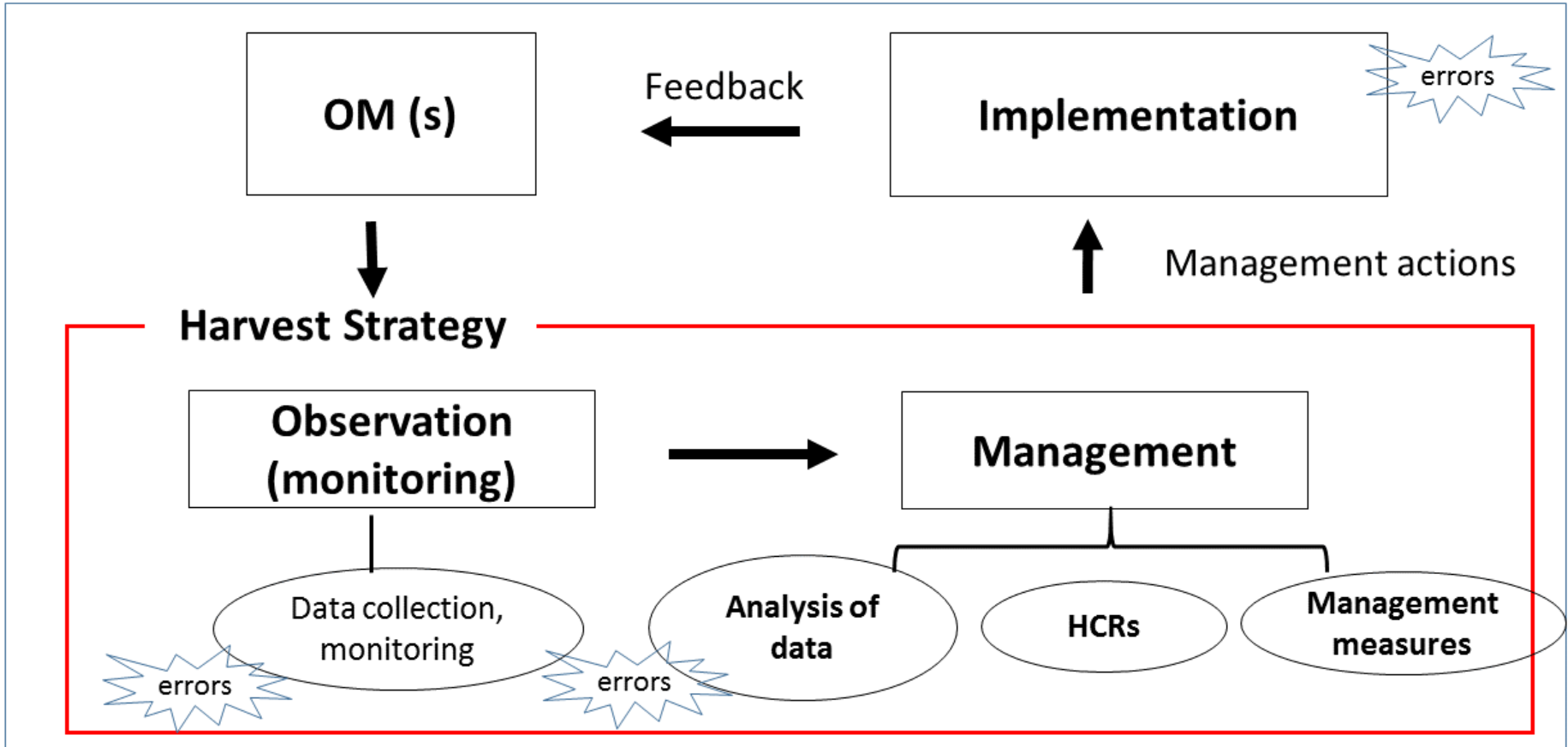
# What is an Operating model?

- **Operating Models (OMs):** provide a mathematical representation of the “true” system
- More than single OM to cover range of uncertainty



# MSE

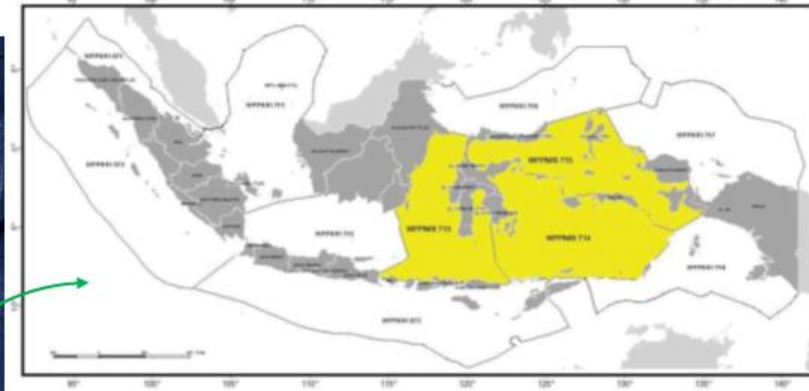
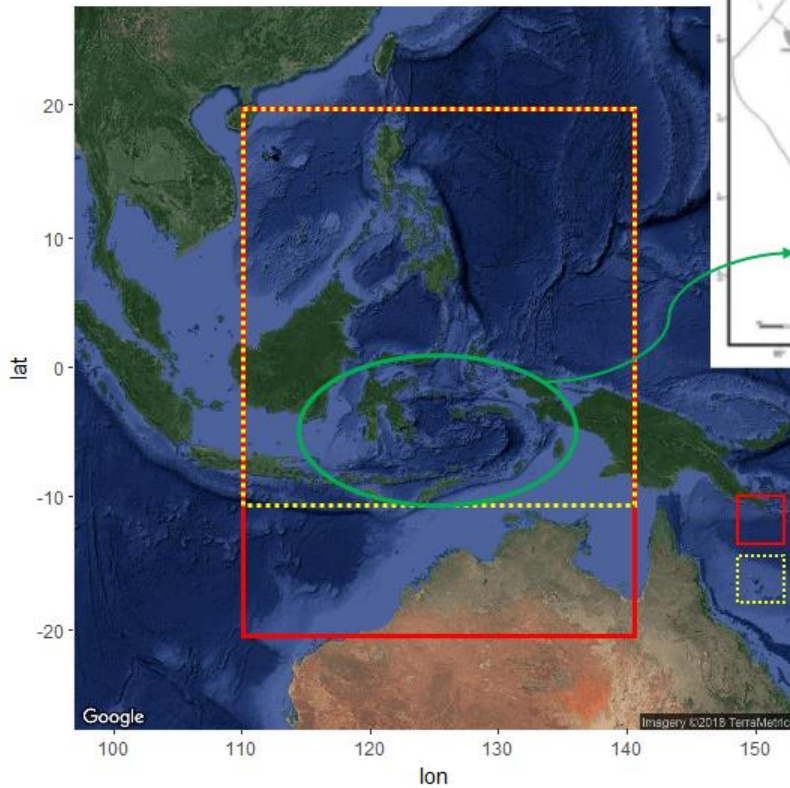
Record performance statistics based on management objectives



# Case study area

WCPO statistical regions

Indonesian AW



Skipjack Statistical Region 4

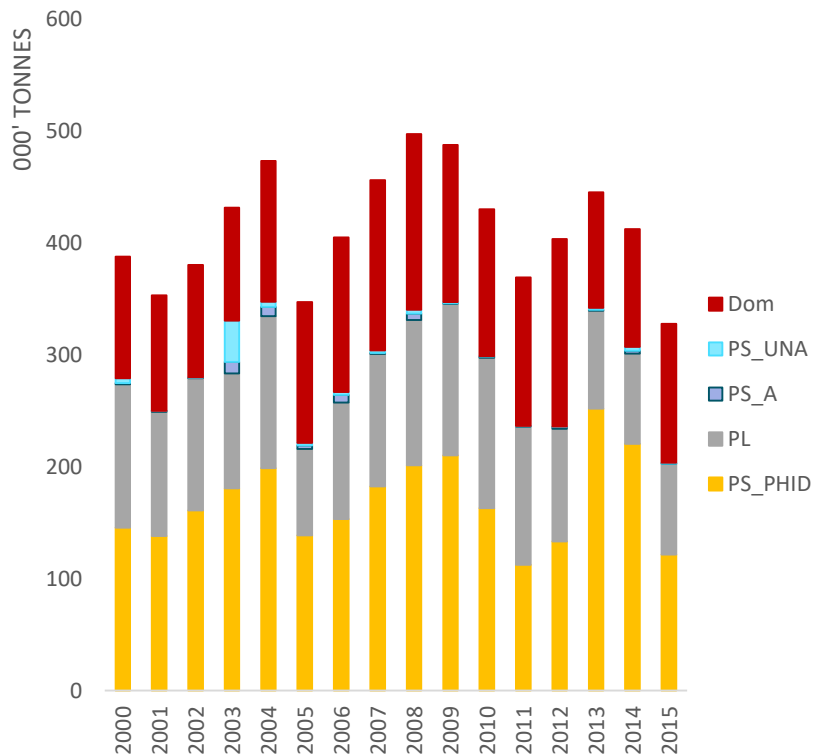
Yellowfin Statistical Region 7

# Key assumptions in prototype OMs

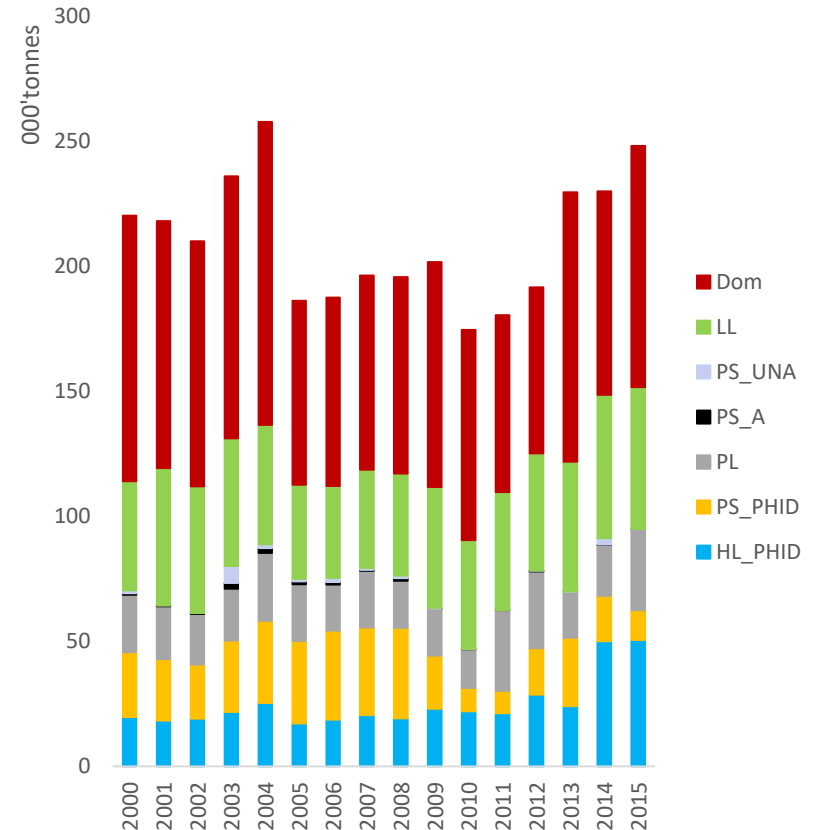
- Used information from the WCPO regional stock assessment outputs and Indonesian port-based monitoring data.
- Single region: 4 (skipjack), 7 (yellowfin) with no migration in/out the areas.
- Harvest strategies applied only to Indonesian fisheries.
- Catch/effort levels of other fishing nations/miscellaneous gear fisheries assumed constant (past 5 year average).
- Our ability to “observe” fish abundance from fishery monitoring data is assumed reasonably accurate.
- Made number of other assumptions

# SKJ and YFT catch estimates (000't)

## Skipjack in region 4

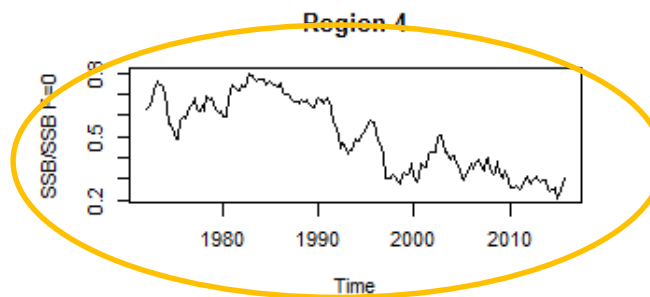
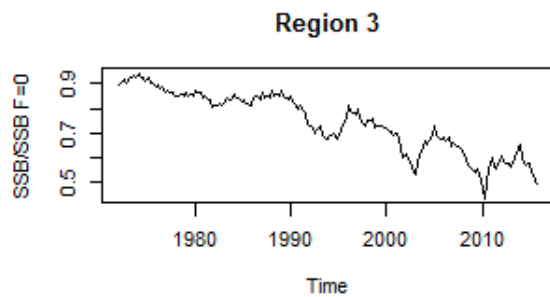
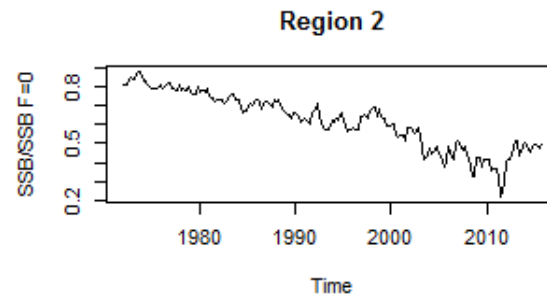
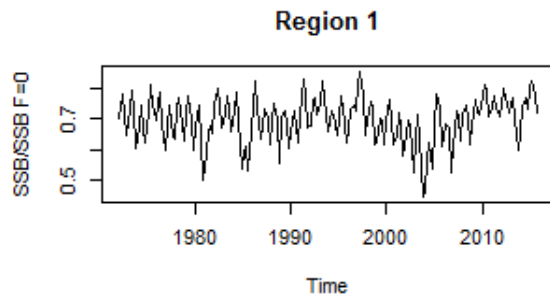


## Yellowfin in region 7

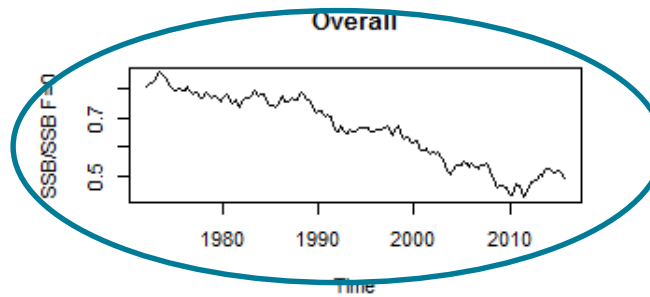
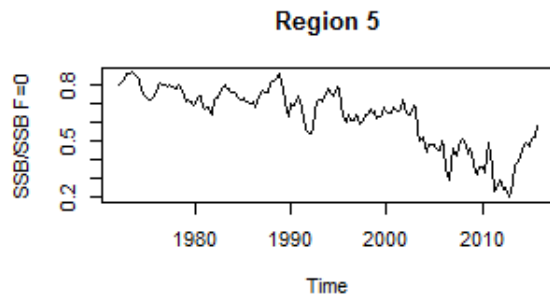


Source: Adapted from MULTIFAN-CL output files

# Current WCPFC advice on stock status - SKJ

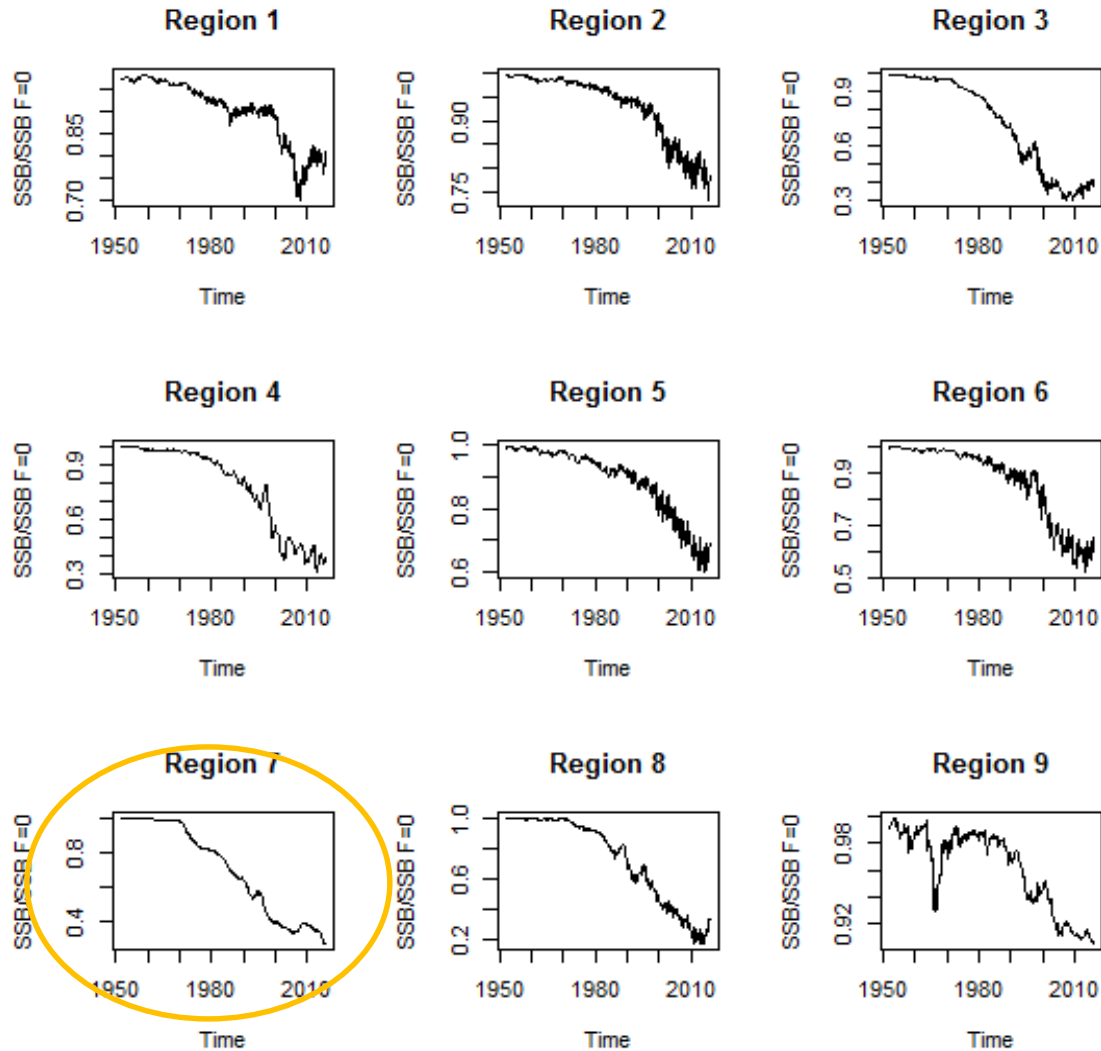


**Region 4**  
**SSB<sub>2015</sub>/SBB<sub>F=0</sub>**  
**= 0.25**



**Overall**  
**SSB<sub>2015</sub>/SBB<sub>F=0</sub>**  
**= 0.58**

# Current WCPFC advice on stock status - YFT



**Overall**  
 $SSB_{2015}/SBB_{F=0}$   
**= 0.33**

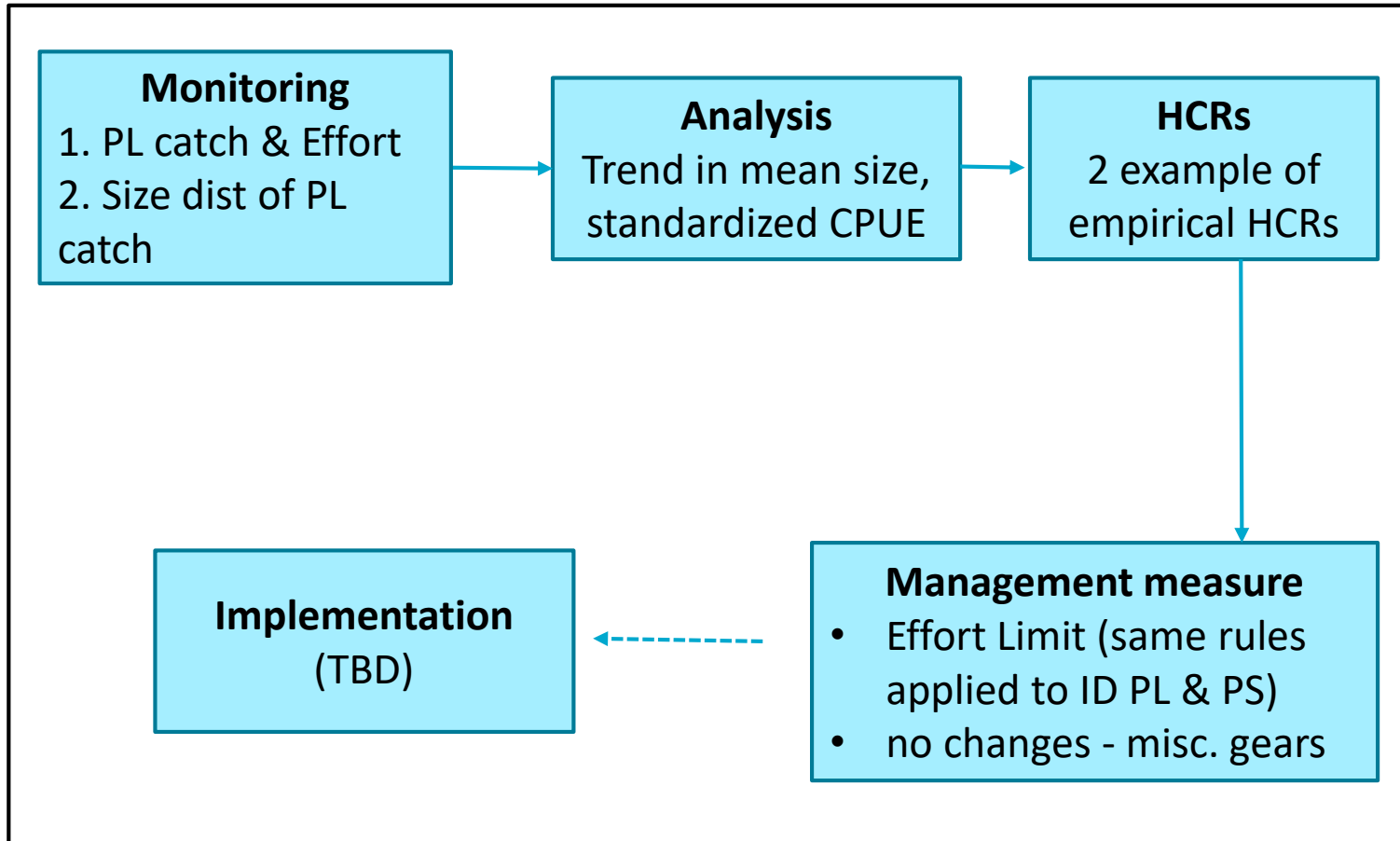
**Region 7**  
 $SSB_{2015}/SBB_{F=0}$   
**= 0.27**



# Key fishery data to be monitored

- **Disaggregated** catch and effort data, size distribution in catch provide us important information about the stock
- CPUE –key indicator of stock abundance **if we can remove** the other factors that influence CPUE (standardization)
  - Skipper
  - Location
  - Time/month/season
  - FAD use
  - Unit of effort
- Size distribution in catch

# Skipjack preliminary HS

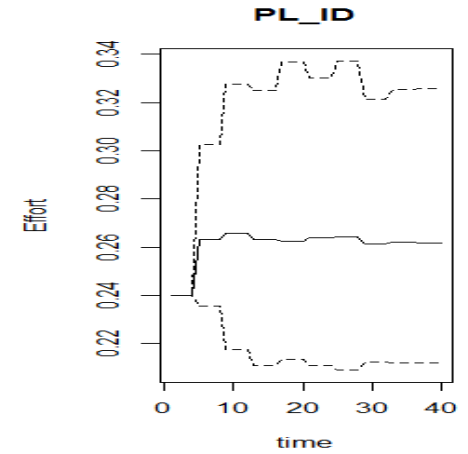
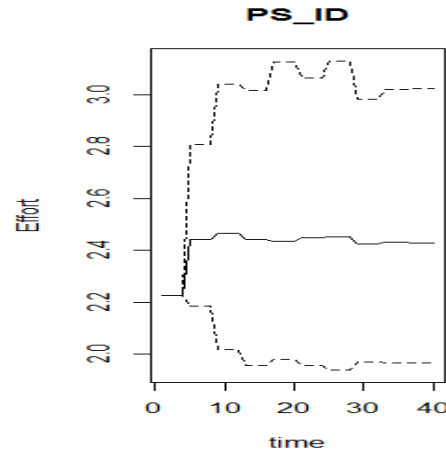


# Snapshot of performance statistics (SKJ)

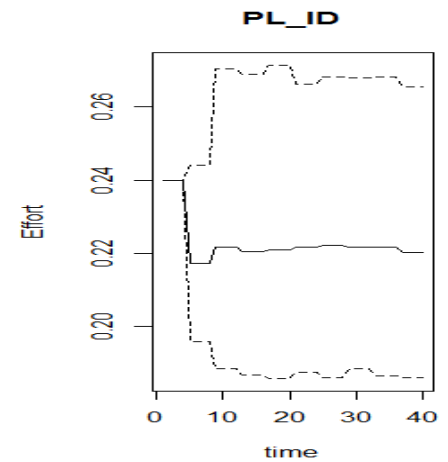
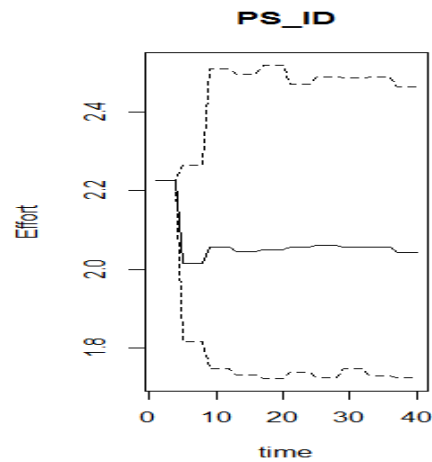
HS names	Scenarios	Performance statistics		
		Meeting target?	Risk to stock ?	Ave.catch % C1
C1	Status quo (maintain E/C <sub>2010-2015</sub> )			100
HS1	Adjust effort moderately based on mean length index			96
HS2	Adjust effort aggressively based on mean length index			85
HS3	Adjust effort moderately based on CPUE index			110
HS4	Adjust effort aggressively based on CPUE index			99

# Effort trajectory for HS3 vs HS4 for SKJ

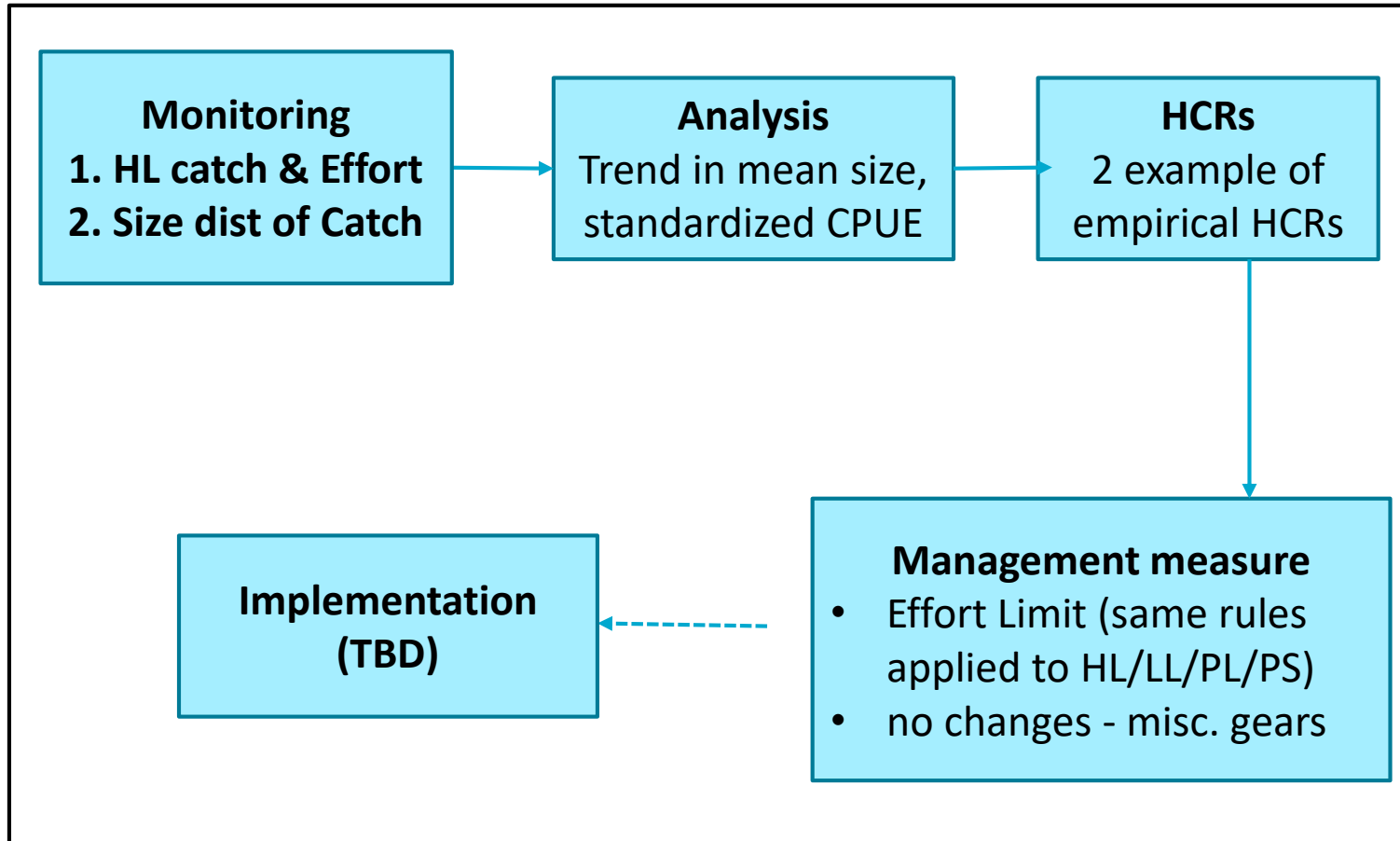
HS3



HS4



# Yellowfin preliminary HS



# Snapshot of performance statistics (YFT)

HS names	Scenarios	Performance statistics		
		Meeting target?	Risk to stock ?	Ave. catch % C1
C1	Status quo (maintain E/C2010-2015)			100
HS1	Adjust effort moderately based on mean length index			90
HS2	Adjust effort aggressively based on mean length index			79
HS3	Adjust effort moderately based on CPUE index			75
HS4	Adjust effort aggressively based on CPUE index			58

# Future work

- Extend the OMs to include highly plausible and important hypothesis and uncertainties.
- How do we change effort/catch? Applied to industrial fleet only? Applied equally to all gears?
- What management measures to be used in reality? How to implement them and to ensure the compliance?
- Inclusion of social and economic data