3rd WORKSHOP ON CONNECTING THE IOTC SCIENCE AND MANAGEMENT PROCESSES (SMWS03)

THE SCIENCE PROCESS AND INTERPRETATION OF SCIENTIFIC ADVICE

Management Strategy Evaluation (a brief overview of the IOTC process underway)

INDIAN OCEAN TUNA COMMISSION
Secretariat

(Presented by David T. Wilson)

Management Strategy Evaluation

Management strategy evaluation (MSE):

– Procedure whereby the performance of alternative management procedures are tested and compared using simulations (Operating model) of stock and fishery dynamics against a set of management objectives.

Operating model:

– Model simulation of stock and fishery dynamics, including sources of uncertainty, used in management strategy evaluation.

Management procedures:

– A set of formal actions, usually consisting of data collection, stock assessment (indicators) and harvest control rules, able to iteratively and adaptively provide robust decisions to manage a stock.

IOTC Management objectives (Resolution 13/10)

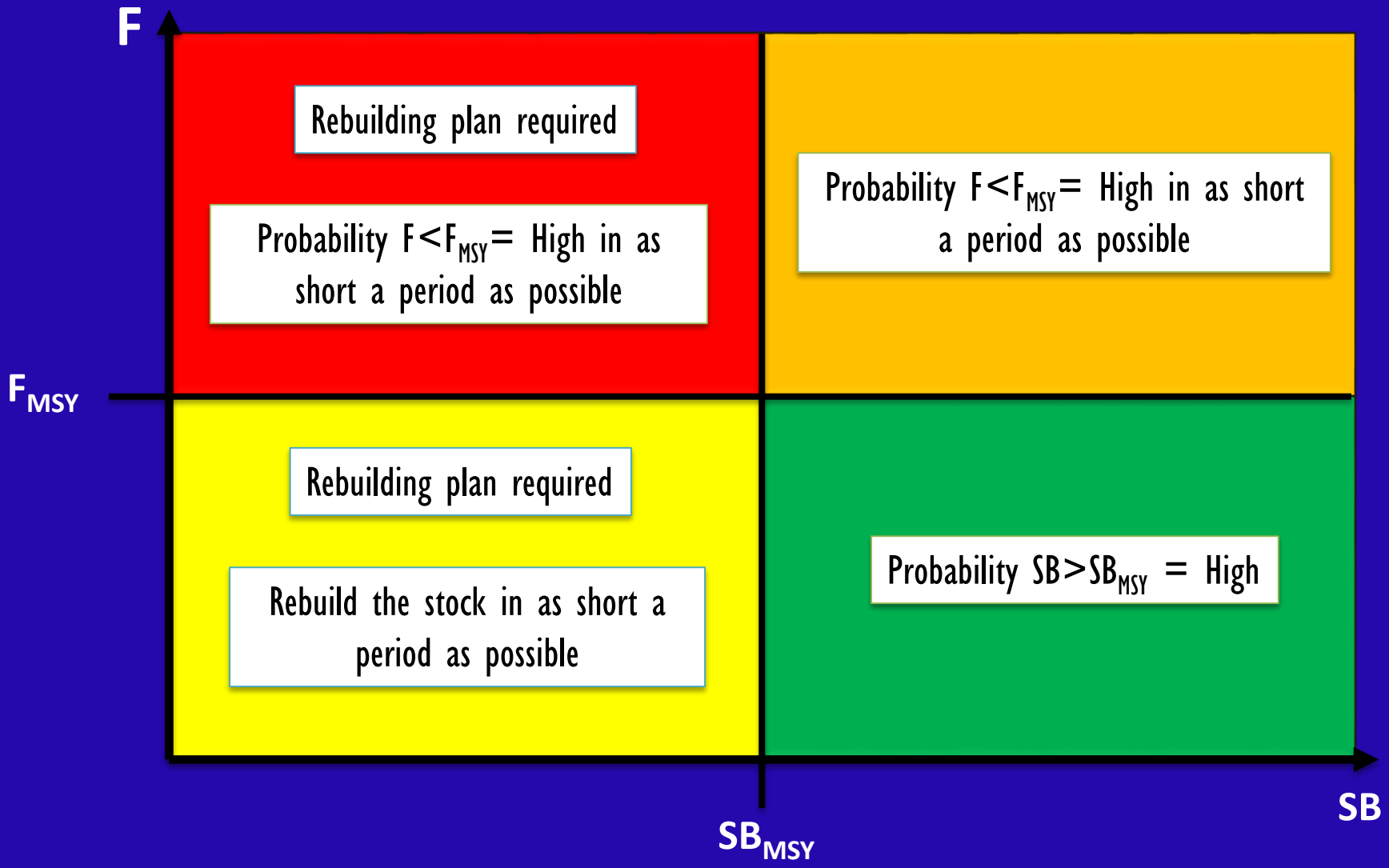
- For stocks whose assessed status is in the lower right (green) quadrant of the Kobe Plot, aim at maintaining the stocks within this quadrant with a high probability

- For stocks whose assessed status is in the upper right (orange) quadrant of the Kobe Plot, aim at ending overfishing with high probability in as short a period as possible

- For stocks whose assessed status is in the lower left (yellow) quadrant of the Kobe plot, aim at rebuilding these stocks in as short a period as possible

- For stocks whose assessed status is in the upper left quadrant (red), aim at ending overfishing with a high probability and at rebuilding the biomass of these stocks in as short a period as possible

IOTC Management objectives (Resolution 13/10)



Management Objectives (cont.)

Management objectives may also incorporate the following goals for a given management stock:

- Social
- Economic
- Biological
- Ecosystem
- Conservation

Target and Limit Reference Points

RESOLUTION 13/10 *ON INTERIM TARGET AND LIMIT REFERENCE POINTS AND A DECISION FRAMEWORK*

Table 1. Interim target and limit reference points

Stock	Target Reference Point	Limit Reference Point
Albacore	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$
Bigeye tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.50\ B_{MSY}$; $F_{LIM} = 1.30\ F_{MSY}$
Skipjack tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.50\ F_{MSY}$
Yellowfin tuna	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$
Swordfish	B_{MSY}; F_{MSY}	$B_{LIM} = 0.40\ B_{MSY}$; $F_{LIM} = 1.40\ F_{MSY}$

Management Procedure: Harvest Control Rules (HCRs)

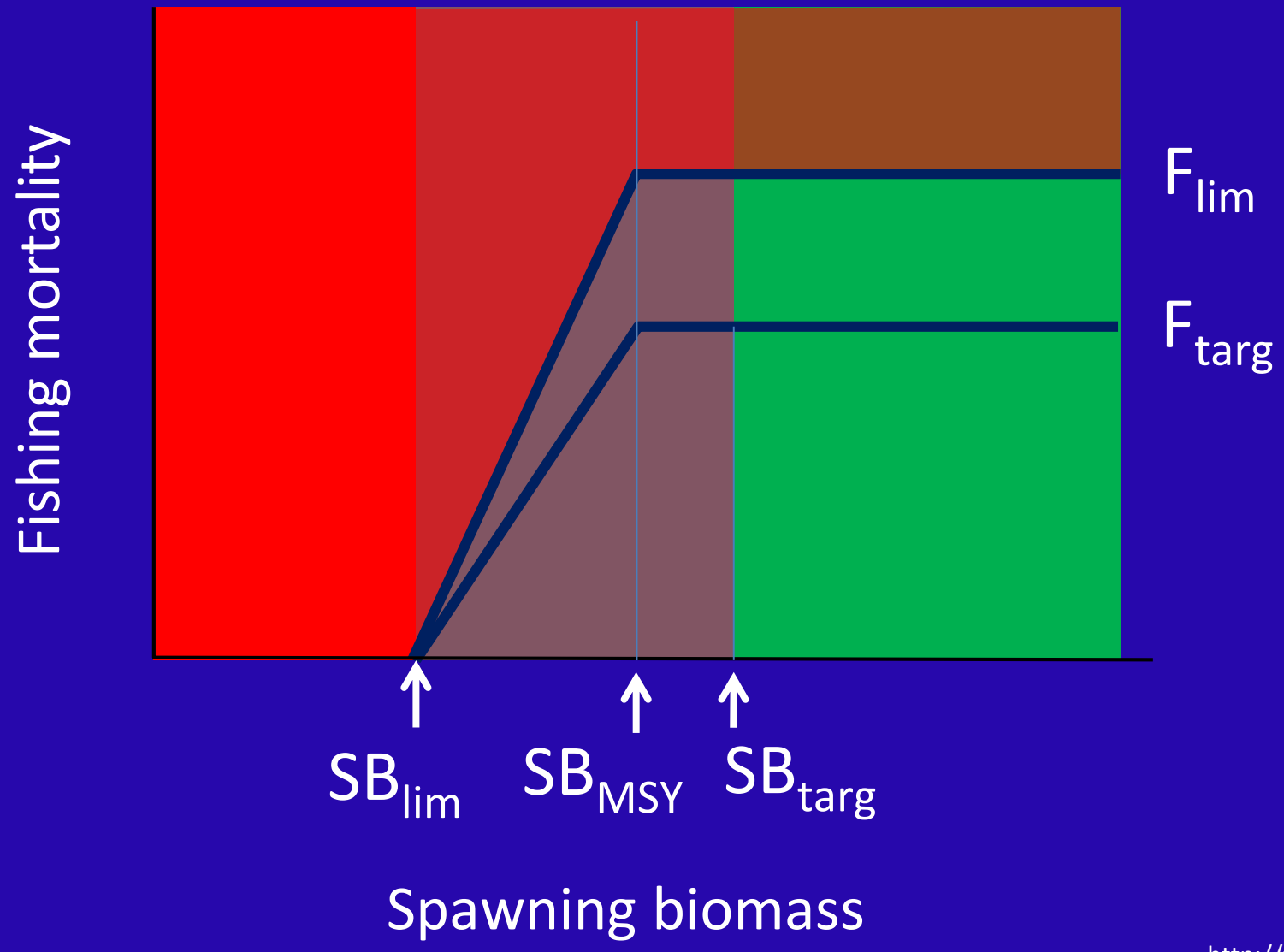
Reference Points (Targets and Limits): Only relevant if placed as part of harvest strategies or pre-agreed decision rules = Harvest Control Rules

Harvest Control Rules (HCR): Pre-agreed response (rules) that management must take under pre-defined circumstances regarding stock status

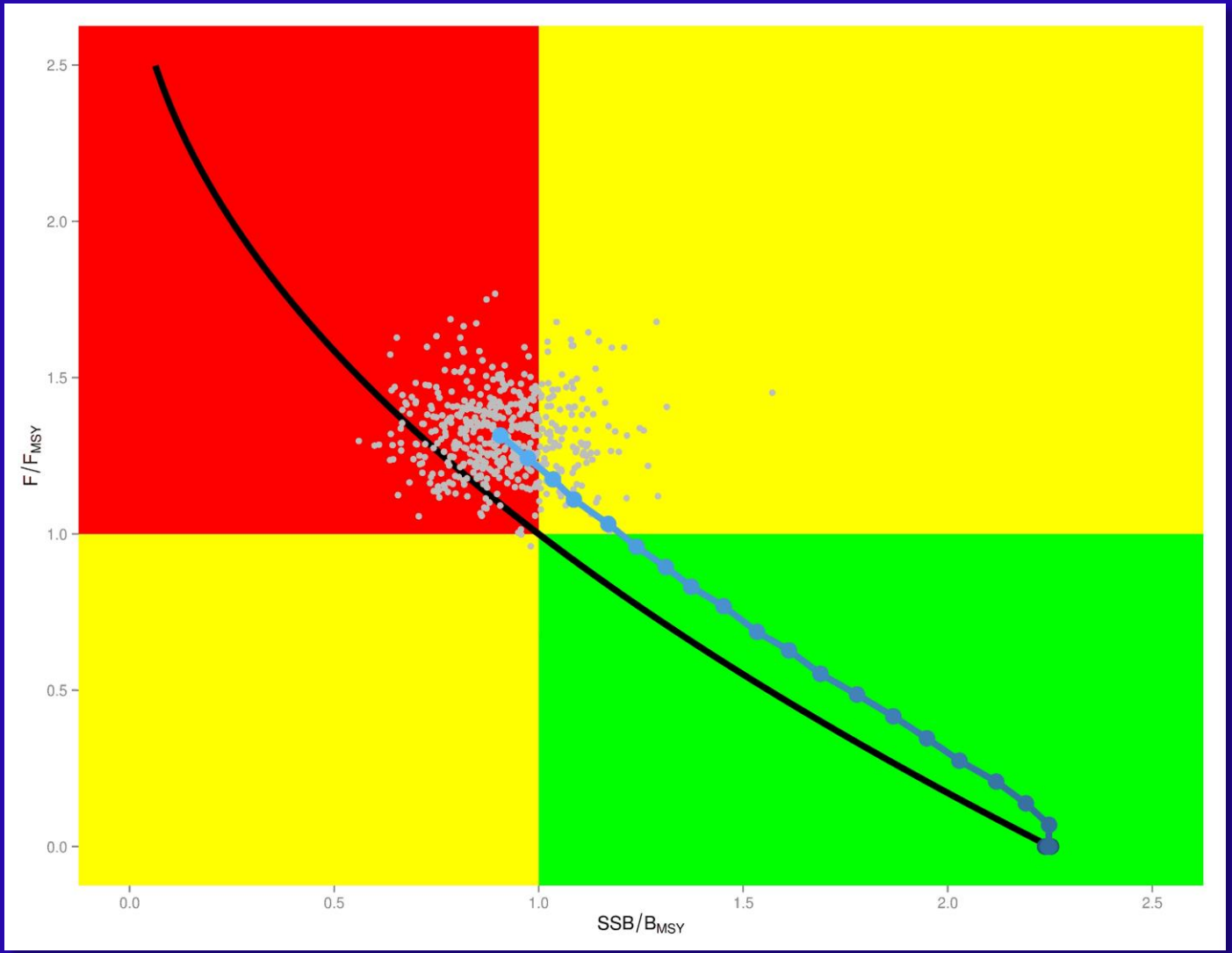
Aim: To ensure that a given stock continually moves towards achieving the Target Reference Points (TRPs) and avoids the Limit Reference Points (LRPs)

Trigger reference point (TrRP): A particular state of the system that triggers a predefined change in the management response

Harvest Control Rules (HCRs)



Harvest Control Rules (HCRs)



Courtesy: ICCAT

MSE Process

A simulation process like MSE does not consist of a series of linear steps, but rather feedback and rethinking need to be undertaken at each step in the process

1. Specify and prioritise objectives, qualitatively/quantitatively
2. Translate objectives into performance measures
3. Develop operating models
4. Identify possible management procedures
5. Simulate the application of management procedures
6. Compare management procedures performance and robustness to uncertainty
7. Select a management procedure that best fits agreed performance criteria