

Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission

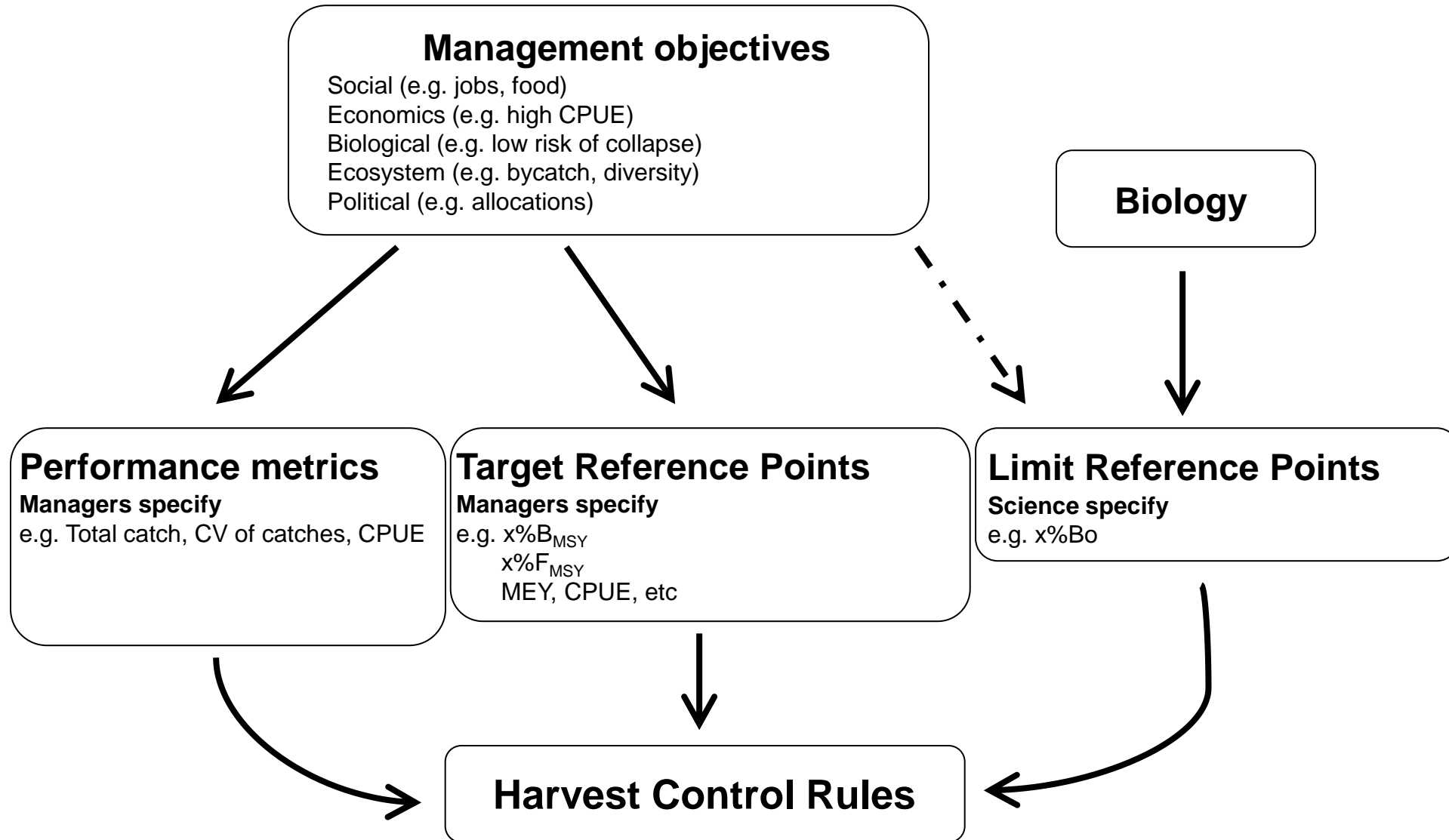


Introduction/Refresher on Management Strategies and MSE

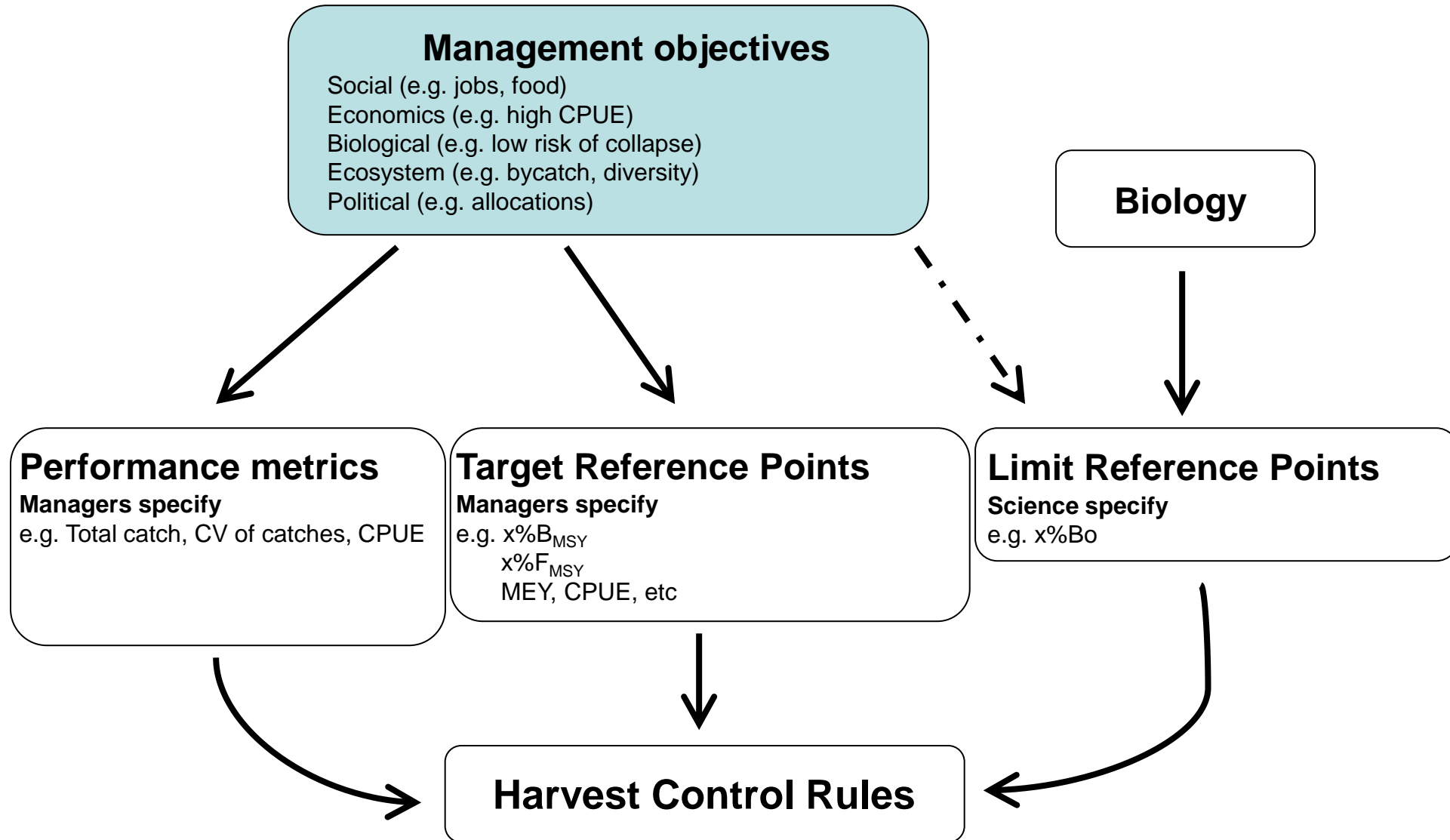
2nd IATTC Tropical Tuna MSE Workshop, *by videoconference*, May 03-04, 2021



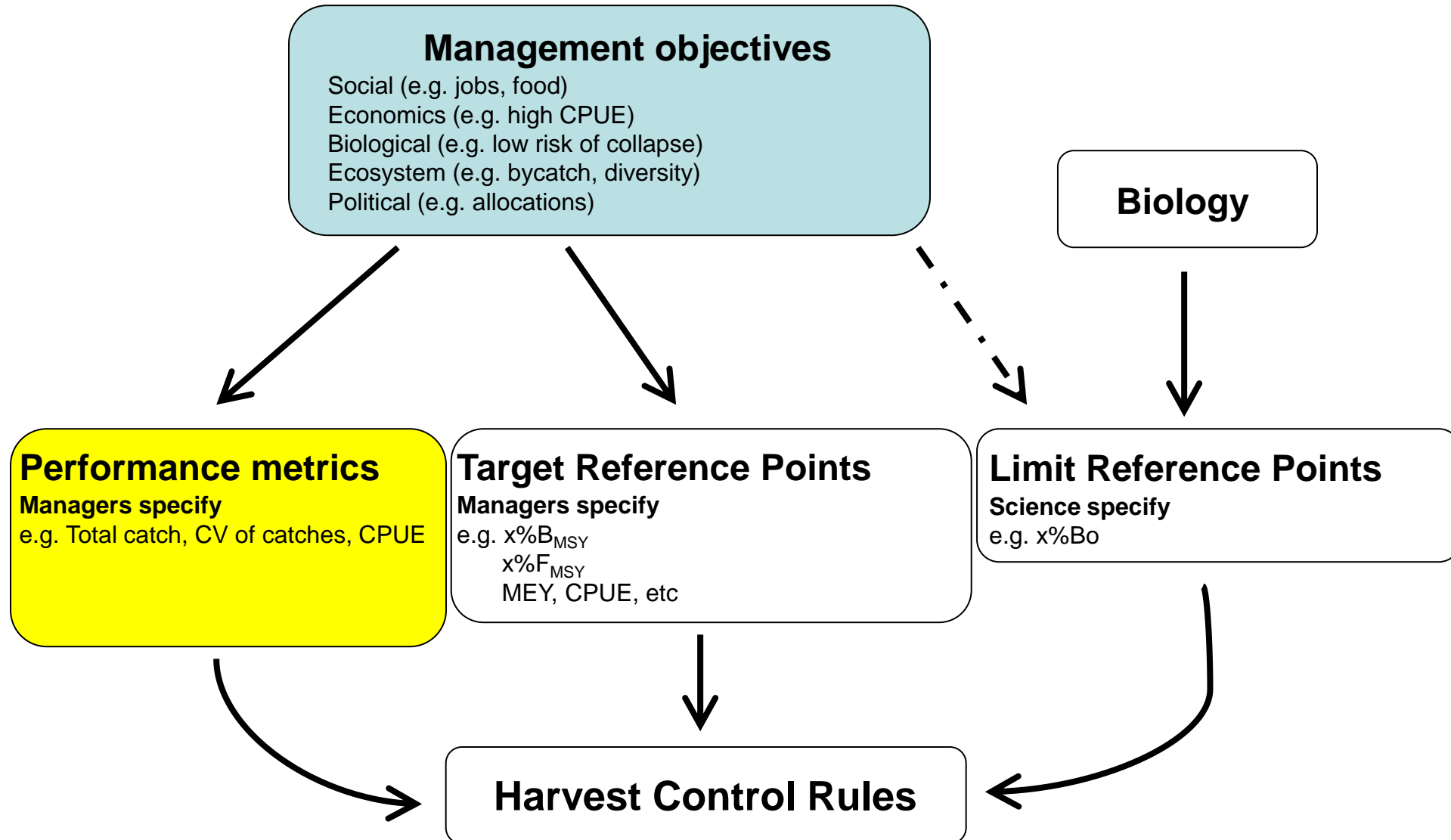
Management strategies



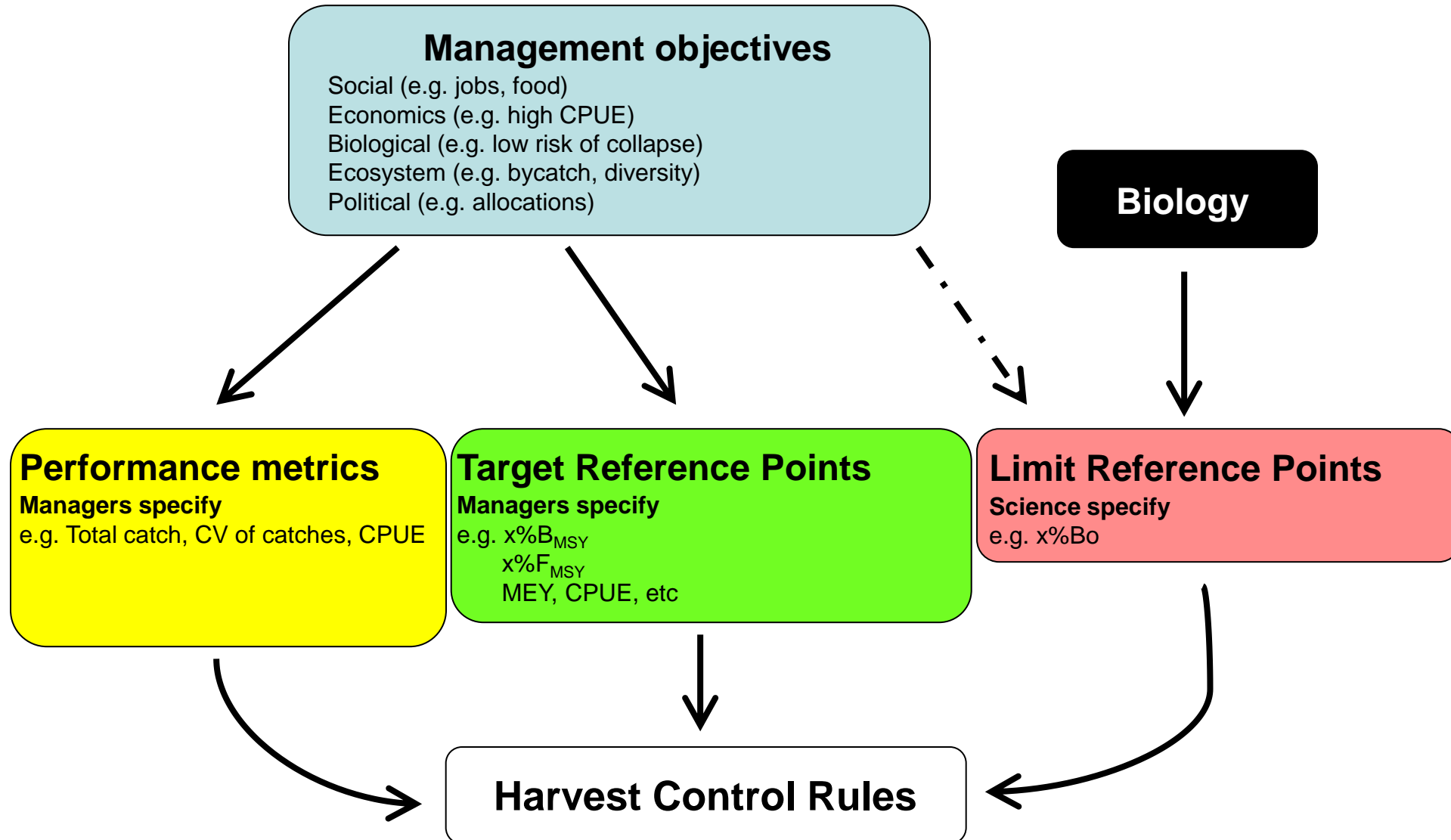
Management strategies: Objectives



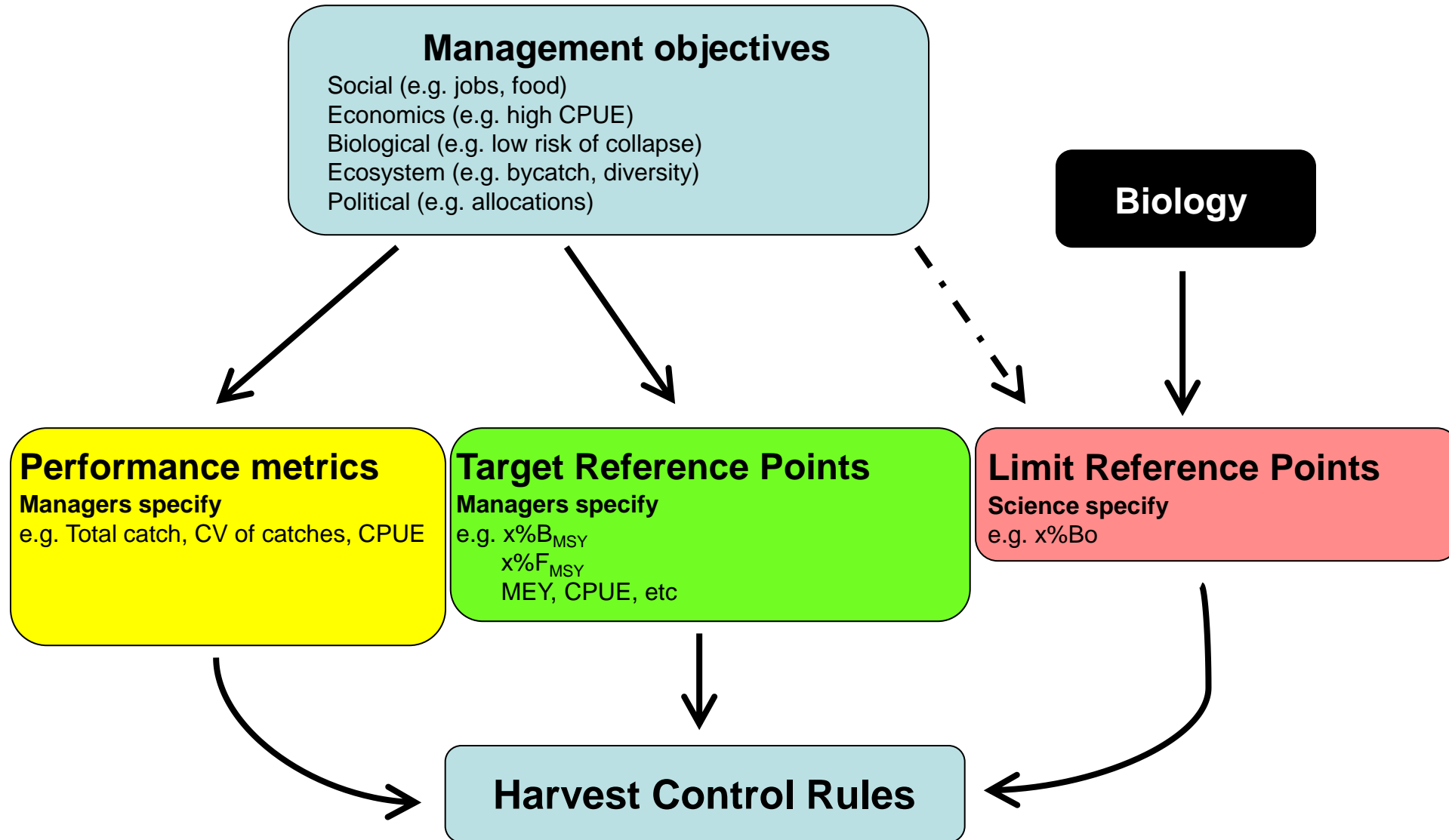
Management strategies: Performance metrics



Management strategies: Reference Points



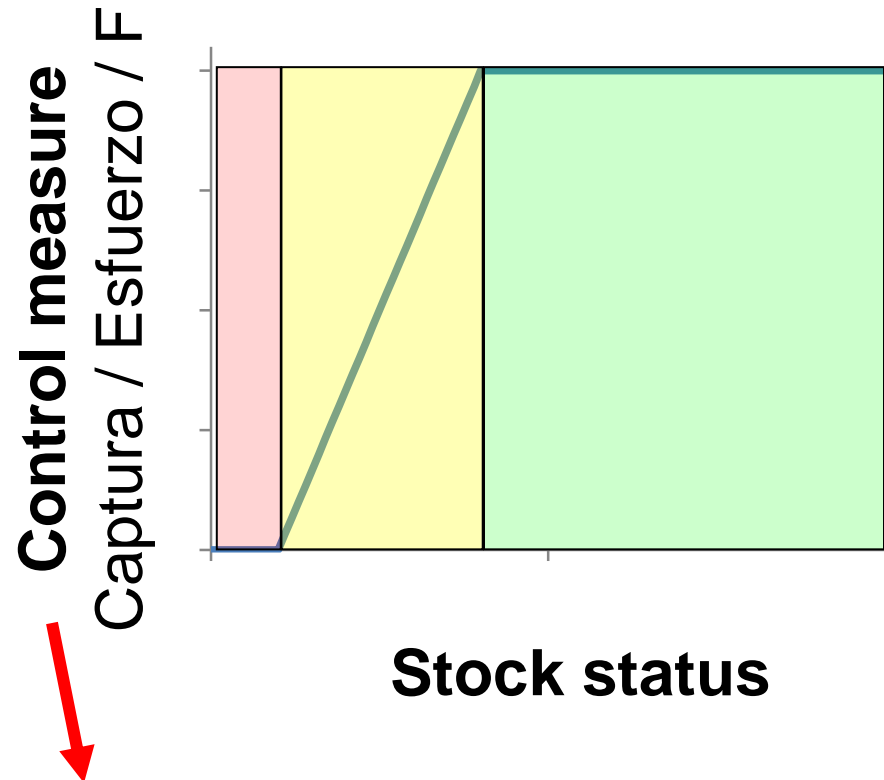
Management strategies: Harvest Control Rules



Harvest Control Rules (HCR)

- **Pre-agreed** management actions to changes in the stock and/or environmental, economic factors relative to **reference points, or trends** in stock indicators.
- Operationalize **management objectives**
- Increase management decisions **transparency**
- Framework to implement harvest strategies using **decision making based on science.**

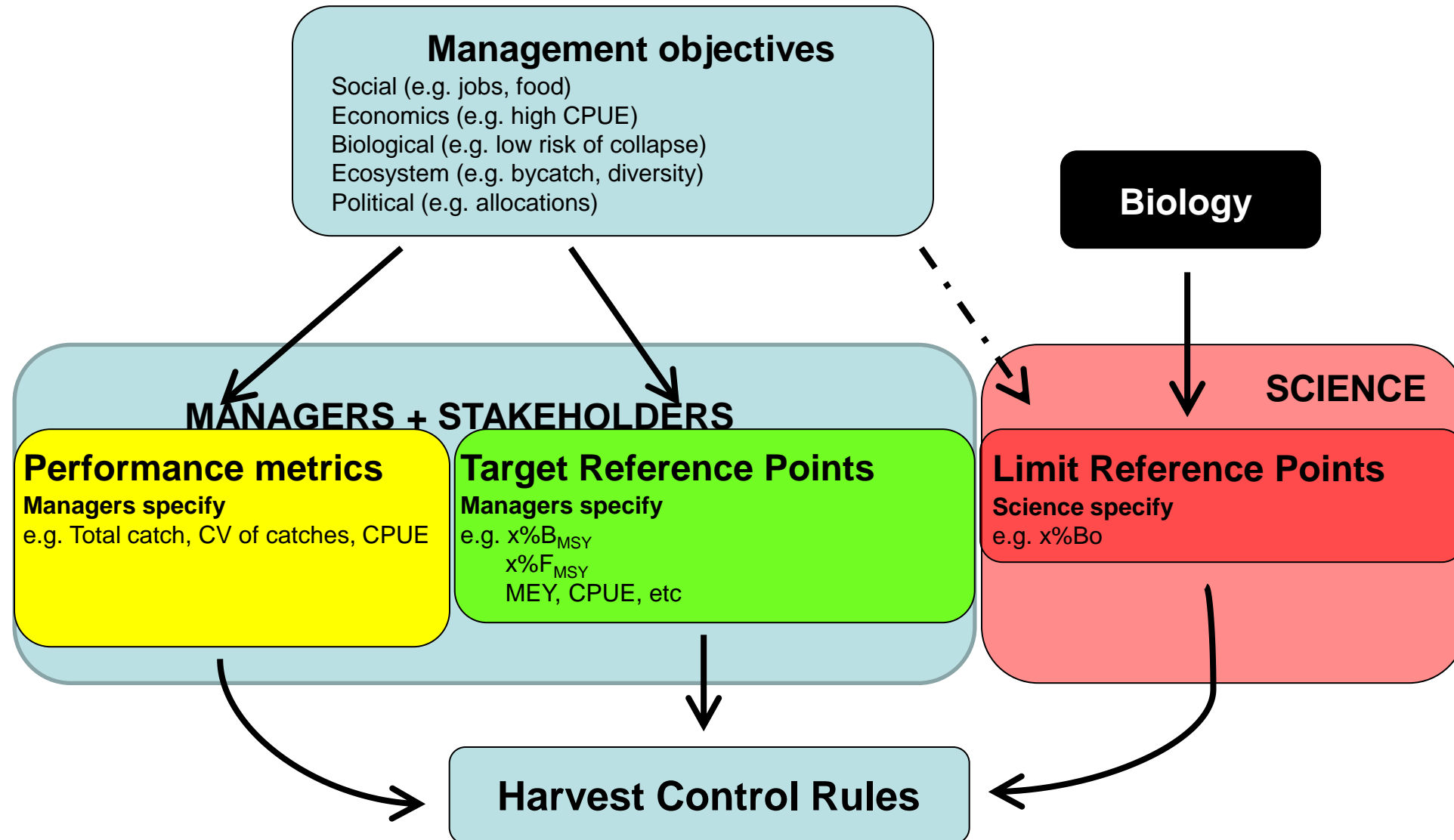
Harvest Control Rule elements



• **Control measure, tactics:**

- Regulations available to apply the strategy

Management strategies: Roles

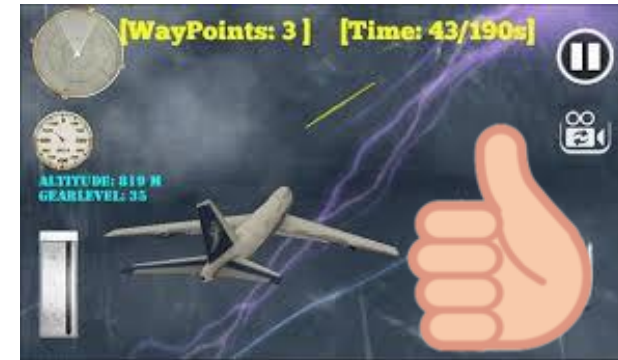


Roles of Participants

- Managers and stakeholders identify:
 - Management objectives,
 - Candidate target reference points,
 - Candidate harvest control rules, criteria against which their performance should be evaluated.
- Scientists identify appropriate biological limits to exploitation and evaluate the performance of identified candidate strategies.

Management Strategy Evaluation

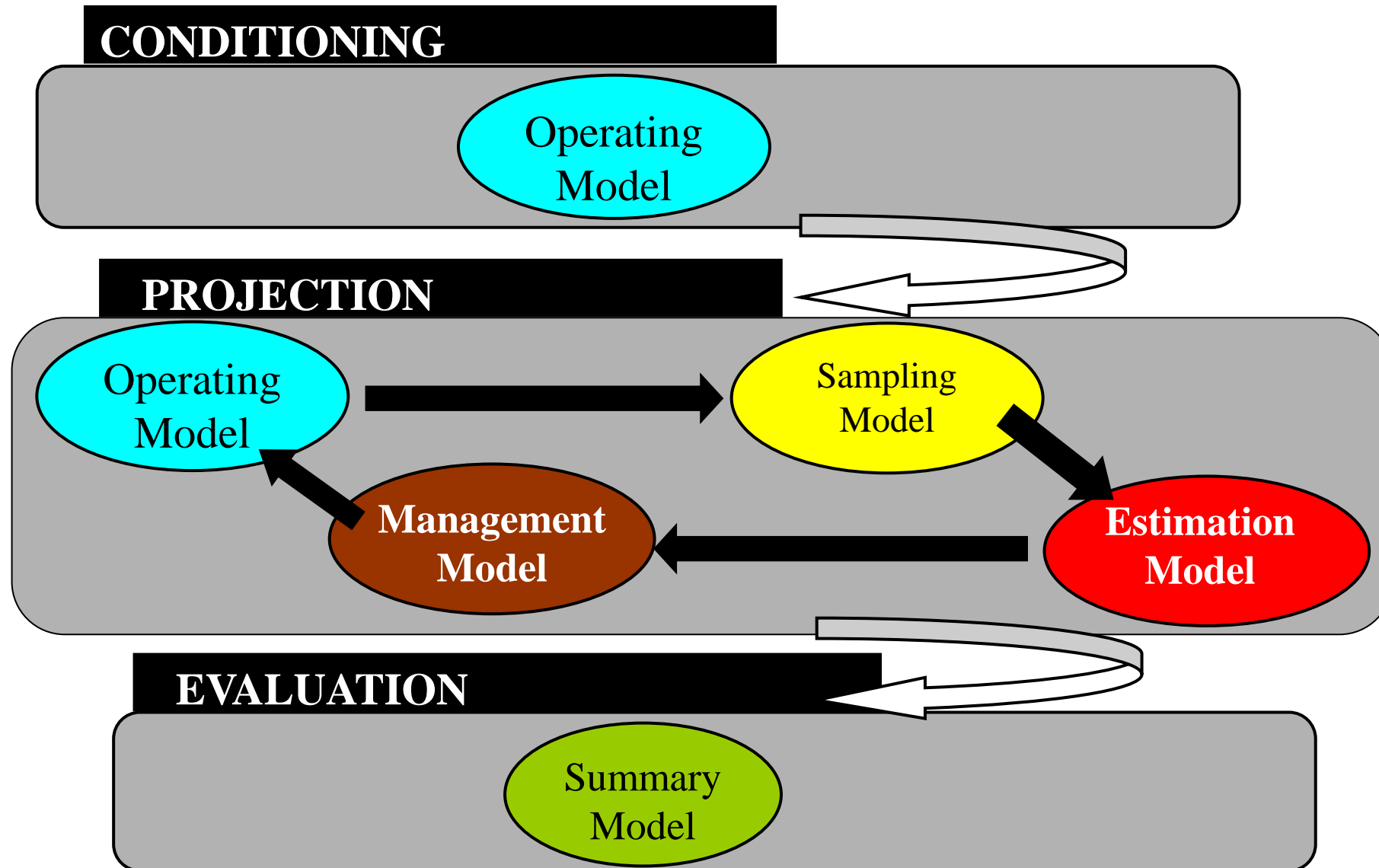
- Not looking for **optimal** strategies
- Looking for strategies **robust** to:
 - Estimation errors
 - Uncertainty about the correct model
 - Uncertainty about implementation
 - Environmental impacts
 - Etc, etc, etc...
- Discarding strategies that don't work
 - If they do not work on the computer, little chance they work in the real world
- **Optimal** strategies can be found if we knew the correct model, but can perform badly if applied to the **wrong model**



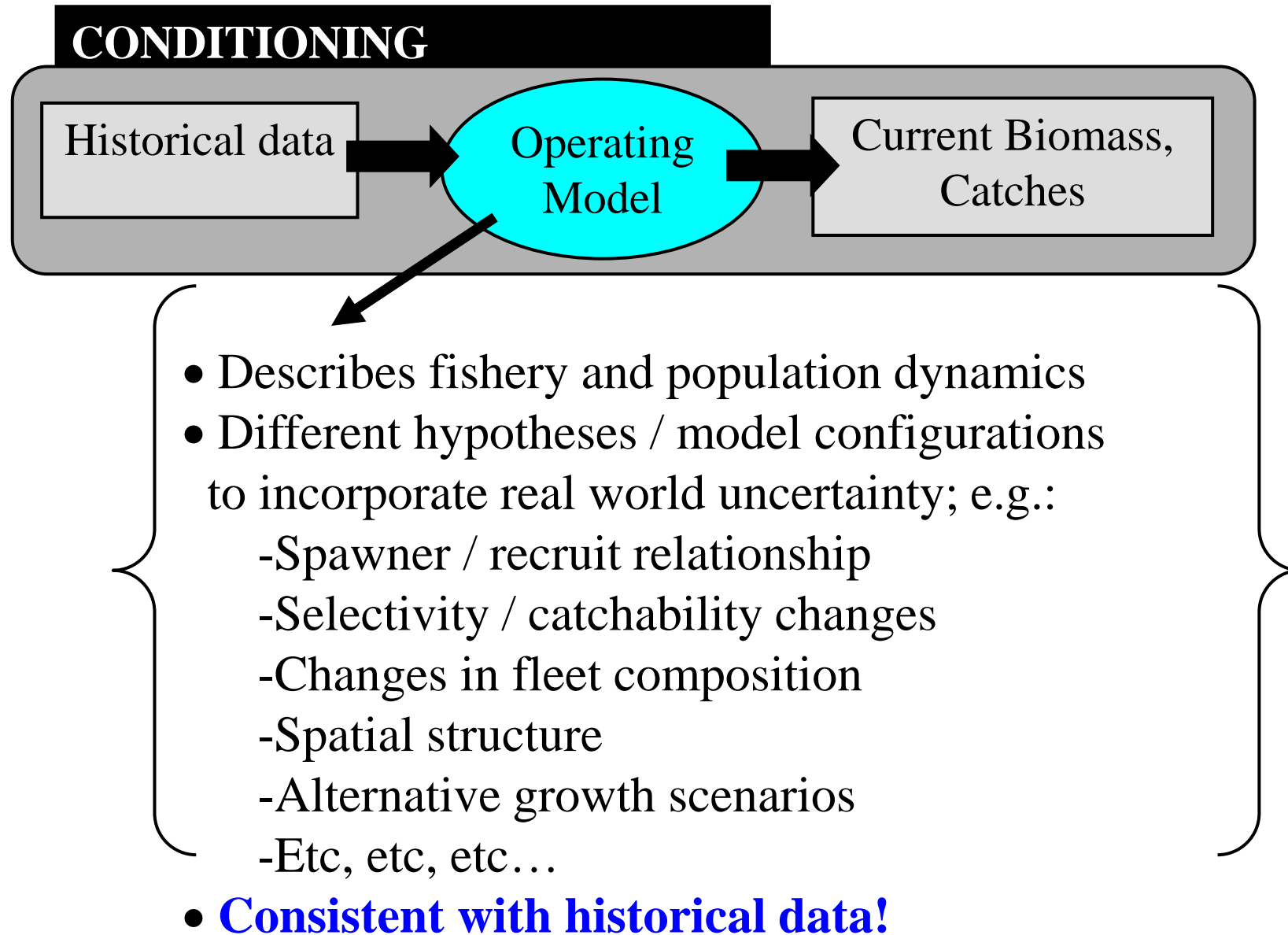
How to evaluate strategies (example)

- Rarely we can evaluate alternatives analytically (i.e. formula)
- Typically, we evaluate alternative strategies using computer simulations:
 - Specify general objectives
 - Preserve the stock
 - Specify operational objectives
 - Maintain the stock in the green sector of Kobe plot more than 50% over 30 years
 - Develop candidate management strategies, harvest control rules, etc.
 - Develop models of the system to manage, and its uncertainty
 - Simulation models describing biology, fisheries, sampling, management, etc
 - Use simulations to explore the results of each alternative strategy
 - Summarize results
 - Decide on what strategy to implement

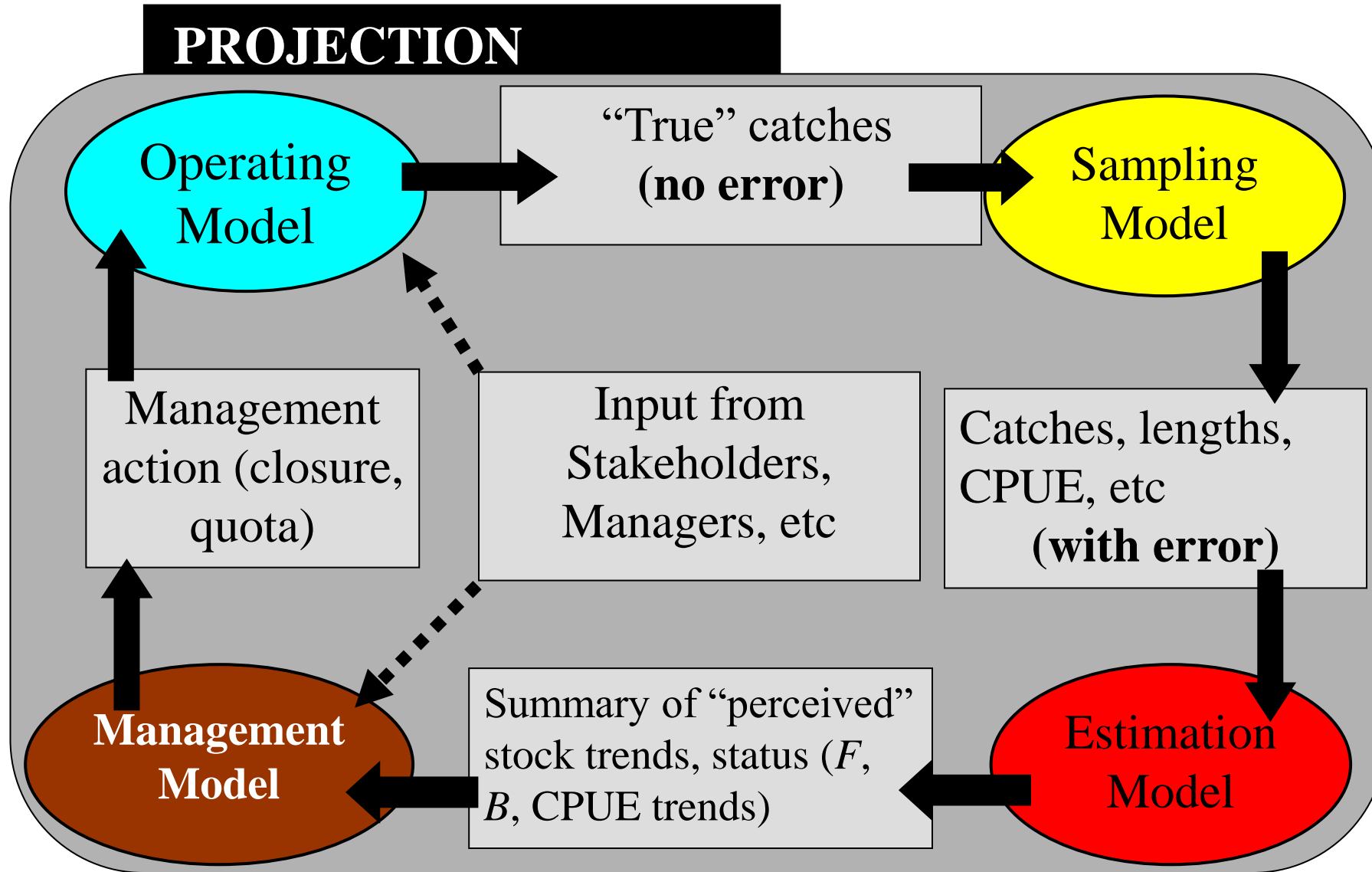
Management Strategy Evaluation: Components



Operating Model and Conditioning



Projection component



Evaluation component

EVALUATION

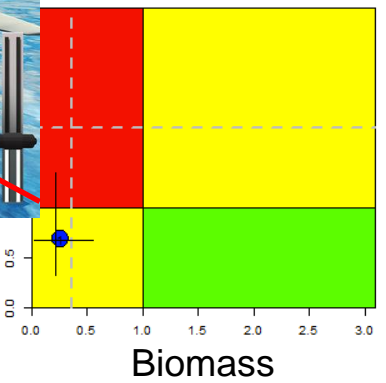
Performance Metrics

Summary Model

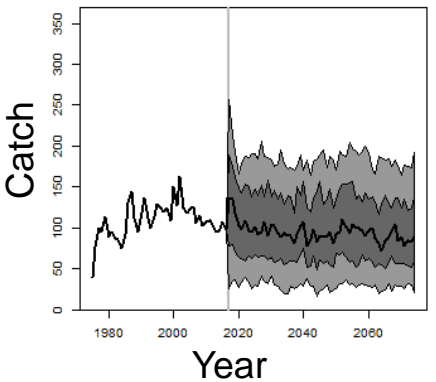
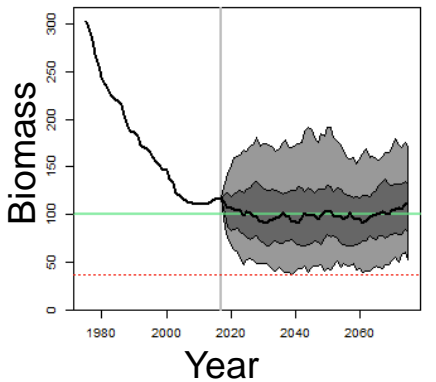
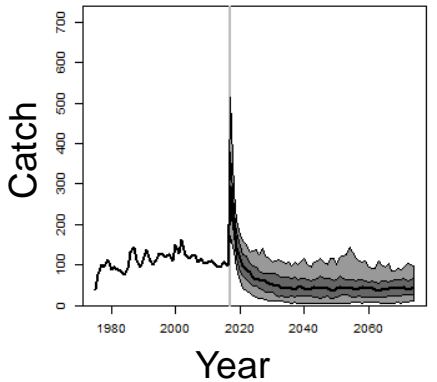
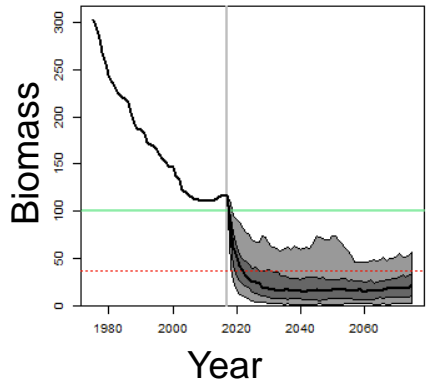
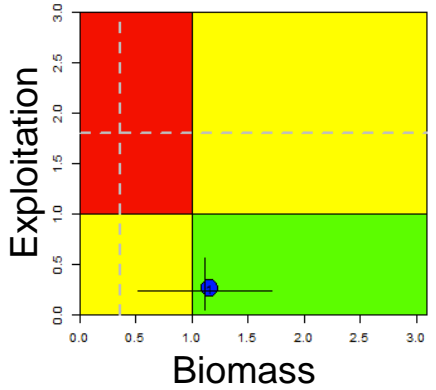
Evaluation of Management



A



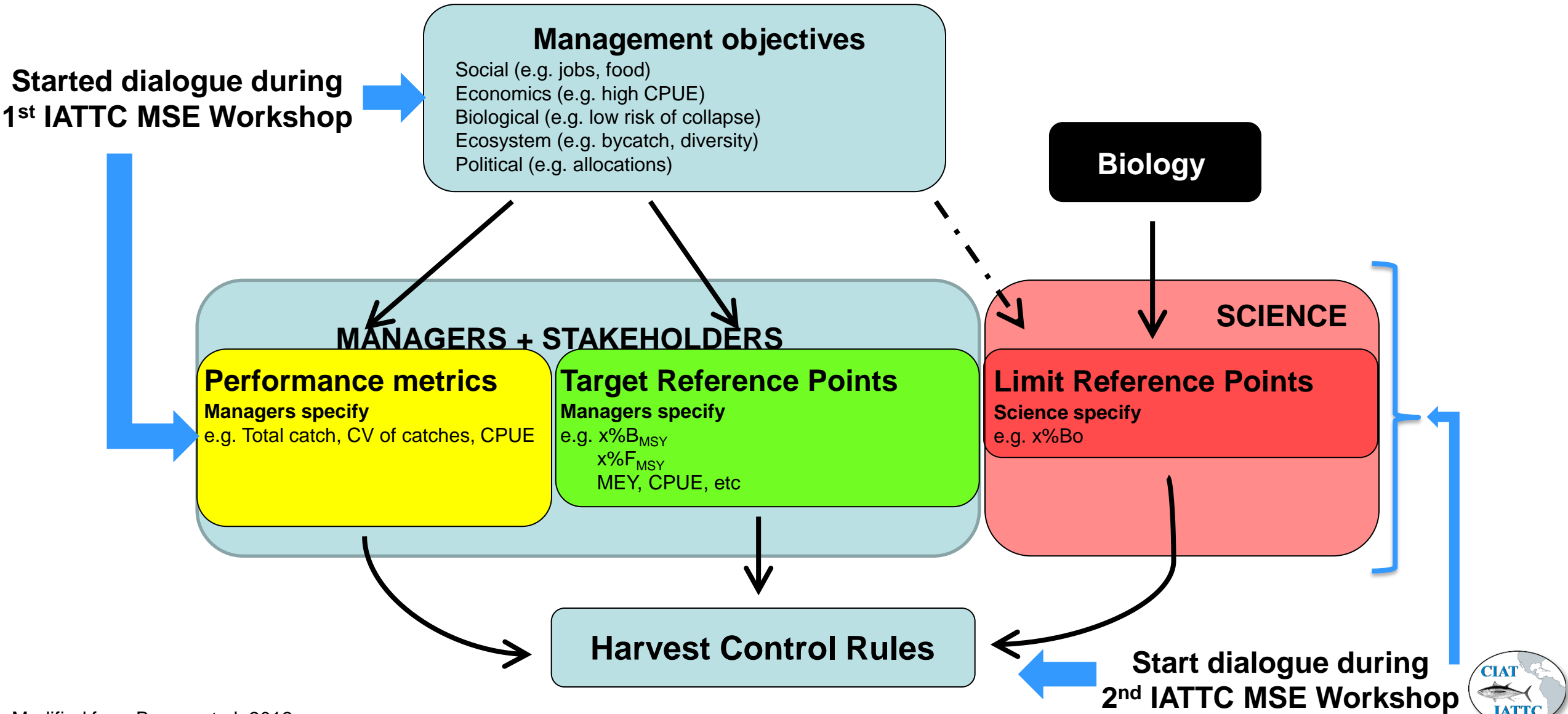
B



Management Strategies and MSE Summary

- Combination of monitoring, stock status evaluation, harvest control rule (with or without RPs) and management actions designed to achieve **fisheries objectives**.
- RPs and HCRs cannot be properly evaluated without specific management objectives, data collection, analyses, treatment of uncertainty and other components of a management strategy.
- Management Strategy Evaluation involves two components:
 - **Dialogue component** to define several alternative strategies to evaluate
 - **Technical component**, computer simulation and evaluation of strategies

Where we are, where we are going?



CIAT IATTC



Questions?