

Management

Harvest strategies

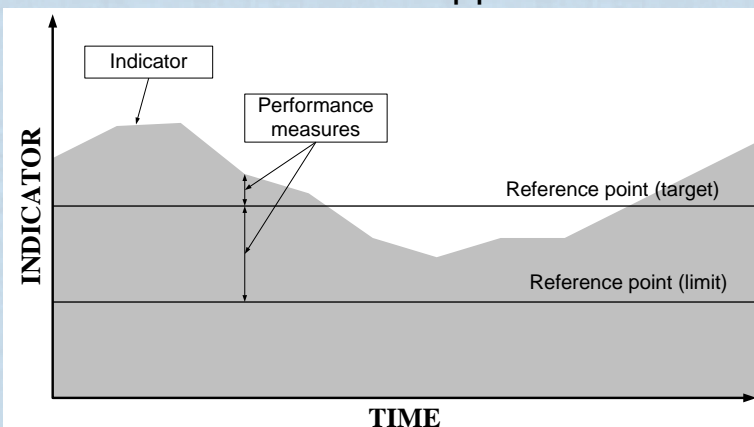
Meaning: A framework for applying an evidence-based, precautionary and transparent approach to setting harvest levels in fisheries.

Harvest strategies are now a common tool used to assess [fish stock](#), and make clear management decisions based on those assessments. All major Commonwealth fisheries are now managed through a harvest strategy, and they are increasingly being used by State agencies.

Harvest strategies should be easy to understand, unambiguous, make sense and be precautionary.

The key components of a **harvest strategy** are:

1. Objective(s) – what the management of the fishery is trying to achieve;
2. Reference Points – benchmarks against which indicators are compared. There are generally two reference points, *target reference points* and *limit reference points*;
3. Indicator(s) – aspects of the fishery that are measured or calculated to provide information on the state of the stock;
4. Performance measure(s) – a measure of where the indicator is in relation to a reference point;
5. Decision Rules (Harvest control rules) – pre-determined rules that control fishing activity based on the results of stock assessments;
6. Meta Rules (Exceptional Circumstances) – pre-determined rules that are applied in the case of exceptional circumstances.



The [target reference point](#) is a desired state of the stock. The [limit reference point](#) is the level of the stock beyond which the risk to the stock is regarded as unacceptably high.

Application of harvest strategies

The example below illustrates the application of the Commonwealth harvest strategy. In this case:

The **limit reference point** (B_{LIM}) is B_{20} (20% of the **virgin biomass**)

The **target reference point** (B_{TARG}) is B_{MEY} (the **biomass** that will achieve **MEY**)

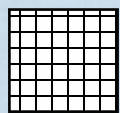
The **indicator** is **stock biomass**

The **performance measure** is the **difference**

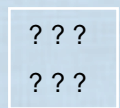
The **decision rules** are adjustments to the levels of **fishing mortality**

If the stock biomass is less than B_{LIM} , the stock is considered overfished, and severe management actions will be taken to rebuild the stock.

If the stock biomass is greater than B_{LIM} but lower than B_{MSY} , some management action will be taken to rebuild the stock.

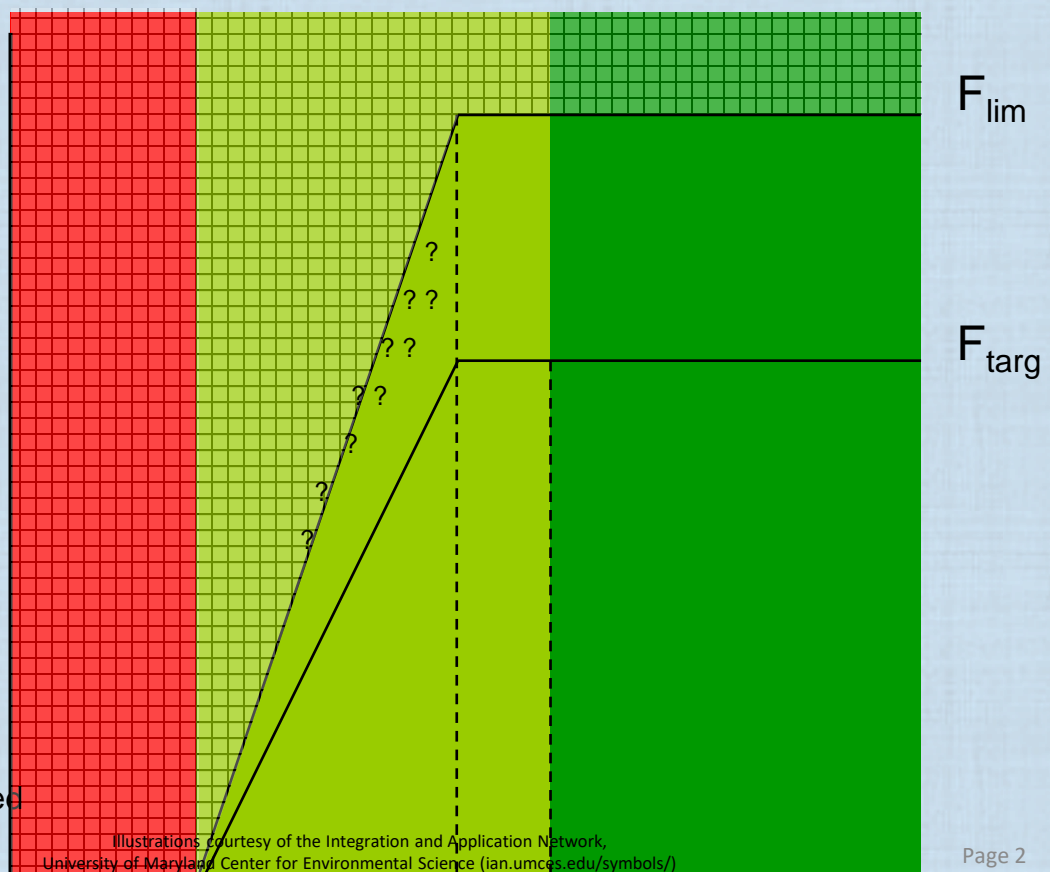


Overfishing



Potential overfishing

Fishing mortality

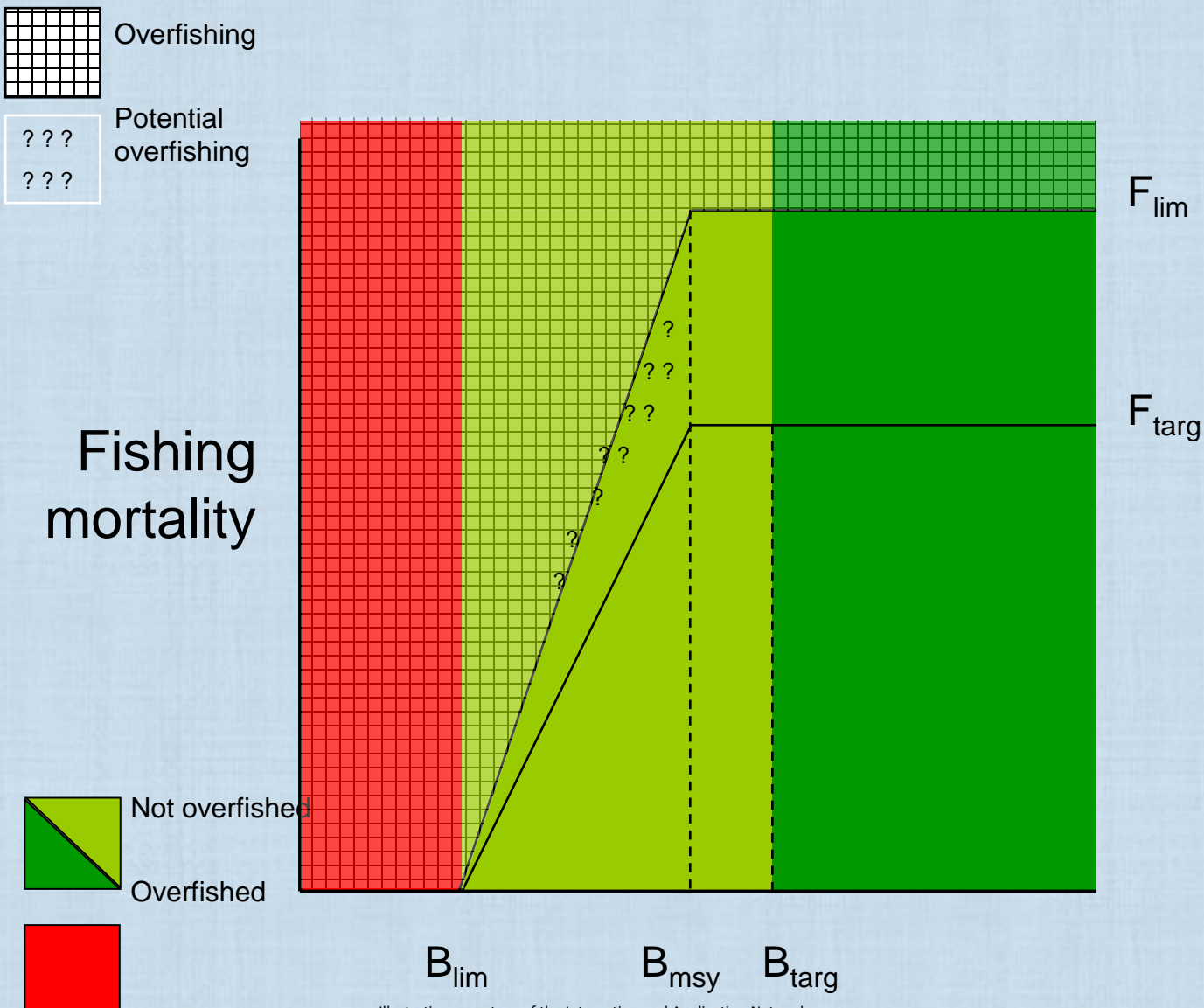


Application of harvest strategies

If the stock biomass is greater than B_{MSY} , management arrangements will be put in place to keep the stock at around B_{TARG} .

If the fishing mortality is greater than a level that will cause the stock to decline to a level beyond which the risk to the stock is regarded as unacceptably high (F_{LIM}), and is said that overfishing is occurring. In that case management arrangements could be put in place to reduce F .

If the biomass is greater than B_{TARG} and fishing mortality is less than F_{TARG} , then management arrangements could be put in place to increase fishing mortality.



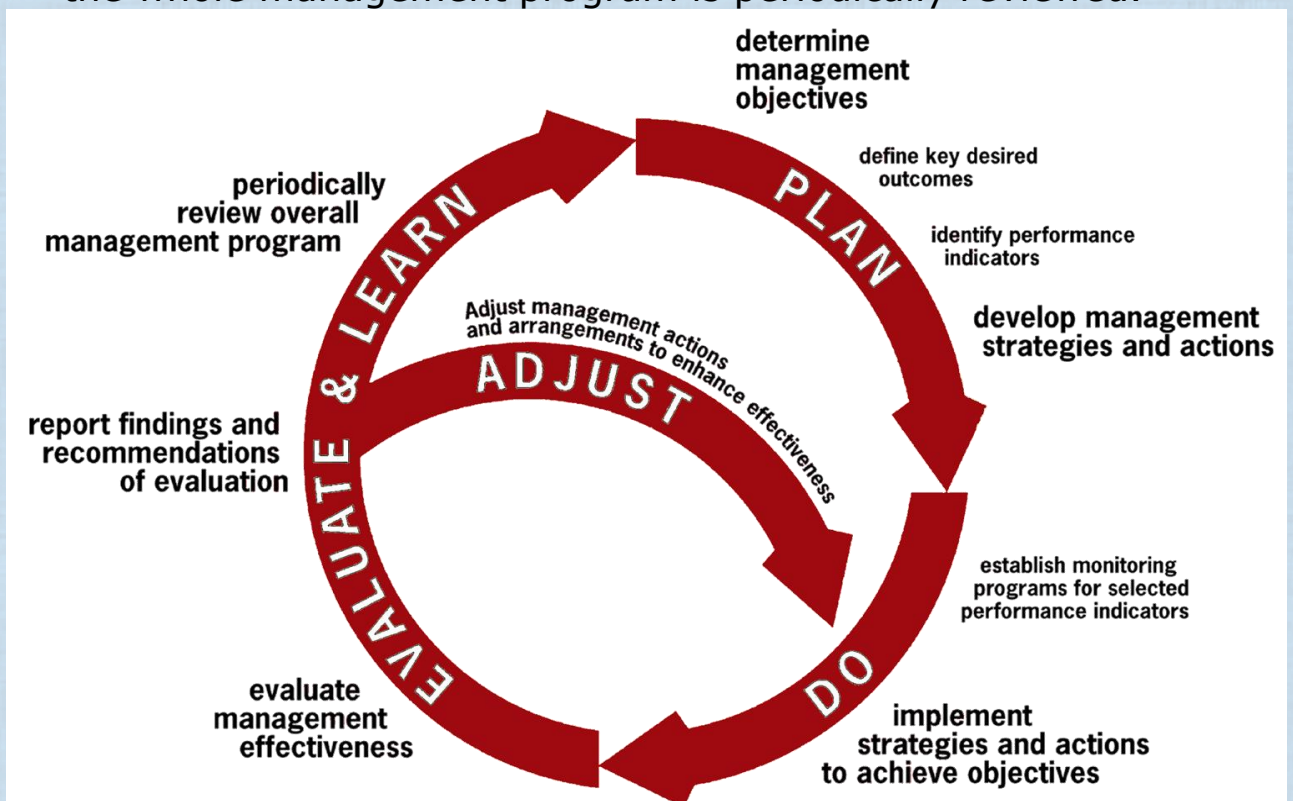
Management Strategy Evaluation

Meaning: the process of evaluating the consequences of alternative management options.

There are many sources of **uncertainty** in the management of fisheries. Some example of these are future environmental conditions that may affect productivity, future social, political and economic conditions, model inputs or the accuracy of the indicator used in the harvest strategy.

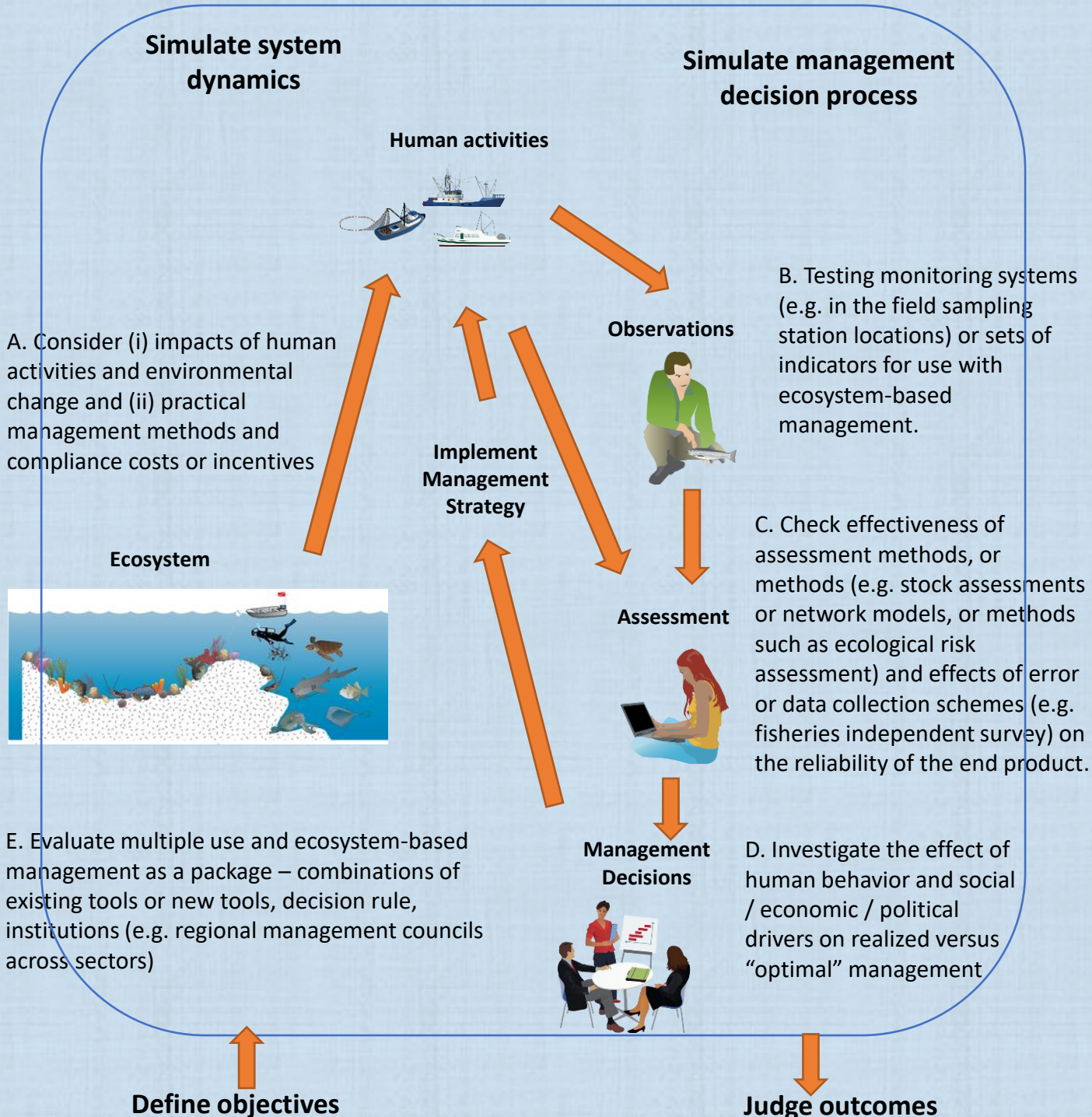
MSE is used to test each component of the **Adaptive Management Cycle**. The **Adaptive Management Cycle** is the process by which

- management objectives are defined;
- management strategies and actions are developed;
- management strategies and actions are implemented;
- the effectiveness of management strategies and actions are reviewed;
- adjustments are made to strategies and actions to improve their effectiveness; and
- the whole management program is periodically reviewed.



Management Strategy Evaluation

The aim of **MSE** test management strategies are robust to uncertainty. This includes all aspects of the adaptive management cycle including the decision making process.



	A	B	C
I			
II			
III			