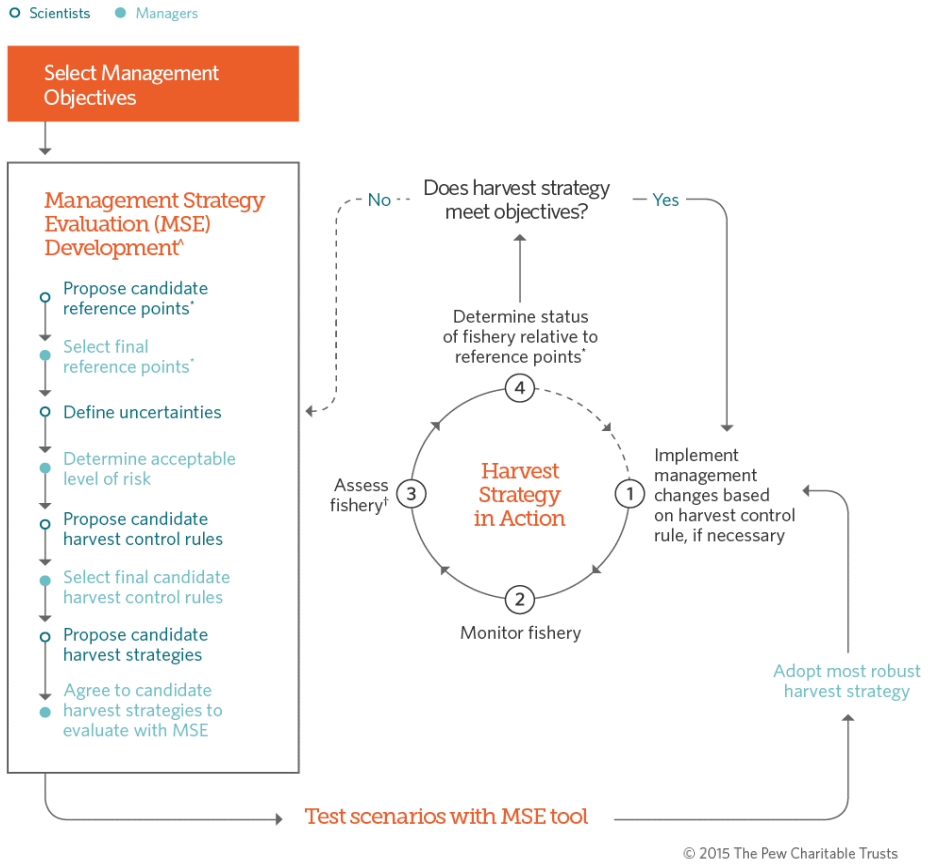
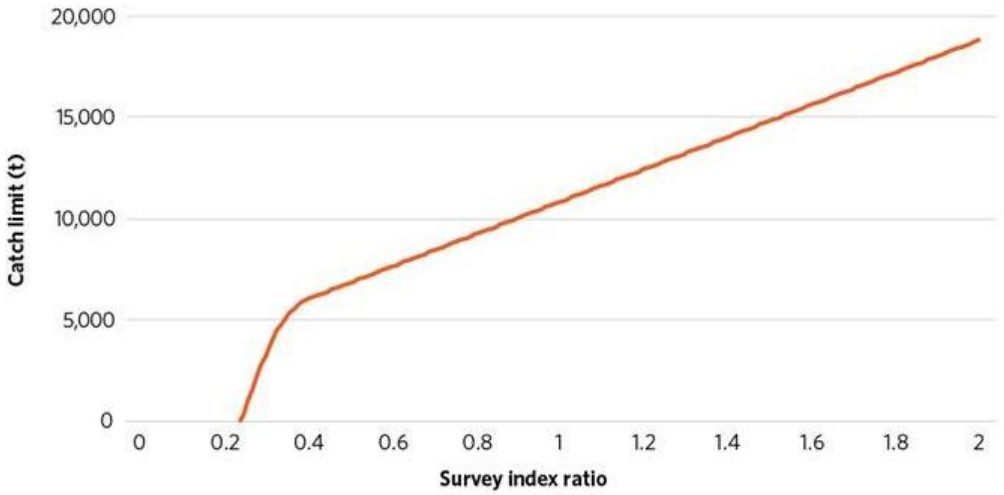
ICCAT BFT MSE quick reference

- ***Management procedure (MP)***: A pre-agreed framework for recommending or making fisheries management decisions, such as setting catch limits, that is designed to achieve specific ***management objectives***. A fully developed ***Management Procedure*** specifies which monitoring data will be collected, how the data will be analyzed, and what ***harvest control rule(s)*** will be applied. Also known as a harvest strategy.
- ***Operating model (OM)***: The part of the ***Management Strategy Evaluation*** that represents the "true" underlying status and dynamics of the population, fishery, and monitoring regime. There will be a number of Operating Models considered so as to capture the full range of uncertainties applying to the resource and fishery. Often two sets of Operating models are used: a "reference set" of the most plausible scenarios or hypotheses with the greatest impact on outcomes and a "robustness set" of unlikely but still possible scenarios or hypotheses.
- ***Harvest control rule (HCR)***: A rule that describes how the harvest is to be managed (e.g., catch- or effort-related limits) based on the state of a specified indicator(s) of stock status. Also known as a decision rule.
- ***Performance statistics***: A quantitative expression of a ***management objective***. Performance statistics compare the value of an indicator or variable (e.g., biomass, depletion) at a given point in time (or over a period of time, such as average catch over the next 20 years) to the stated objective for this indicator, so as to evaluate how well the objective is expected to be achieved under the MP being evaluated. Also known as performance metrics or performance measures.



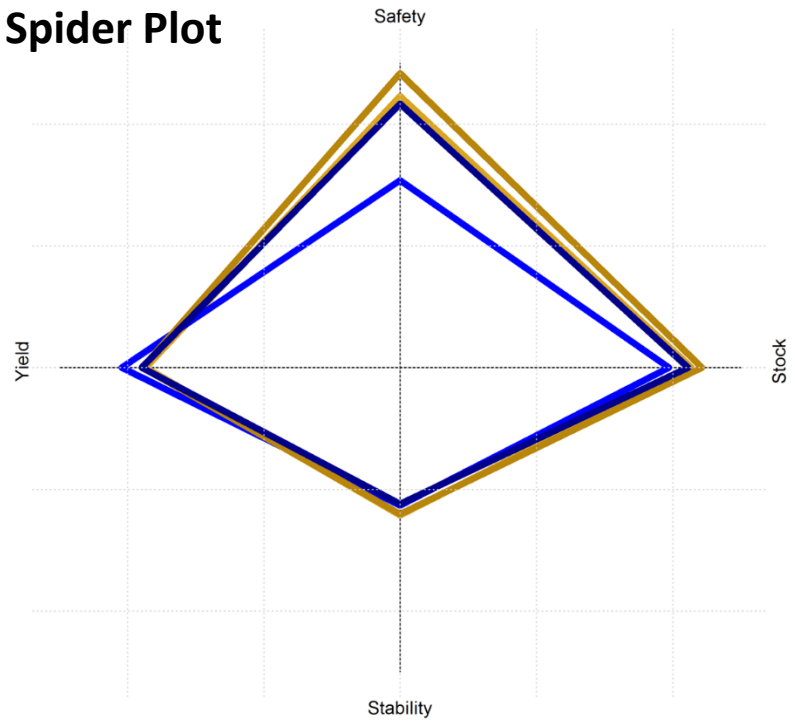
- ***Management Strategy Evaluation (MSE)***: A structured approach to evaluating management procedures against pre-defined goals and objectives.
- ***Management Objectives***: Formally adopted goals for a stock or fishery. These include high-level objectives often expressed in legislation, conventions, or similar documents. As the process progresses, they should also include operational biological and socio-economic objectives that are specific and measurable and possibly also associated timelines and minimum required probabilities that can be achieved.

Example of a empirical management procedure



- Empirical management procedures can be used for making fisheries management decisions, such as setting catch limits. These decision rules can often be based on changes observed in a survey or CPUE index as seen in the above figure. As the survey index increases the Catch limits increase, as the survey index decreases the catch limits decrease.

- B_{MSY}: The biomass level producing maximum sustainable yield (MSY) at equilibrium.
- B_{LIM}: a level below which there is high probability that productivity is impaired and serious harm will occur.
- Fishing mortality rate (F): Continuous annual rate of loss of fish from a population due to fishing.
- F_{MSY}: The fishing mortality rate resulting in equilibrium biomass of B_{MSY} and, therefore, achieving MSY.



- Spider plots are used to visualize the results of ***performance statistics*** of multiple ***management procedures*** in one figure. Better values are towards the outside, worse values are towards the inside. Here each colour represents a different ***management procedure.***