

Harvest Strategies, Harvest Control Rules and Management Strategy Evaluation: Introduction

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Kaohsiung, 16 December 2016

Harvest Strategies



Simple Definition of STRATEGY

Popularity: Top 1% of lookups

: a careful plan or method for achieving a particular goal usually over a long period of time

: the skill of making or carrying out plans to achieve a goal

Source: Merriam-Webster's Learner's Dictionary

- Interchangeable with **Management Procedures**
- Components (3 "core" ones):
 - Objectives
 - **Monitoring** → What data (e.g. CPUE, catch ...)
 - **"Assessment"** → e.g. CPUE standardization, production model
 - **Harvest Control Rule** → How catch will change depending on "assessment"
 - Implementation

Types of Harvest Strategies

Empirical

- Use empirical reference points from fishery history (e.g. CPUE 2001-2004), or empirical “proxies” for model-based reference points (CPUE of average size fish in catch based model estimate of reference point).

Model-based

- Use quantities estimated from a stock assessment model (e.g. B_{MSY} , F_{MSY}) as reference points.

Benefits of Harvest Strategies

- Reduces the problems associated with consensus-based management
- Agreed and transparent basis for consistent management (with more transparent and consistent science too)
- Greater understanding of cumulative effects of management decisions and impacts of uncertainty
- Enhanced long-term planning for the industry and governments
- Experience shows improved outcomes for stocks, fisheries and communities. A best-practice approach to fisheries management

Management Strategy Evaluation

What is Management Strategy Evaluation?

- A strategic risk assessment tool
- Prospective evaluation of alternative Harvest Strategies
- Selection of HSs that are most likely to meet management objectives and “robust” to major uncertainties
- Two components
 - Consultative process
 - Technical implementation

MSE Consultative process

- Facilitate specification of quantitative objectives for management goals and practical alternative management strategies
- Elicit conceptual models of fishery and stock dynamics
- Reporting, interpretation, discussion and direction to technical process

Manager-scientist dialogue

MSE Technical Process

- Construction of “**Operating Model**” of stock and fishery dynamics = “virtual fishery”
- Operating model is “**conditioned**” to fishery specific data
- Construction of “**observation**”, “**assessment**” and “**management**” models based on feasible alternatives = “management strategies”
- Management strategies are “**evaluated**” in the operating model.
- Iterative process: involves several iterations of feedback and refinement based on initial results. It can take many years

Scientists do this; lots of jargon and complexity

Can HCRs or HSs be adopted without MSE?

- **Sure** (e.g. IATTC and IOTC 2016)

MSE is a tool for testing and comparing alternative HSs/HCRs. If you are looking to establish something to achieve objectives in the long term, you will want to test it first. [Like building a building](#)

strategy 
noun | strat·e·gy | \-jē\

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Why do Management Strategy Evaluation?

- RELATIVE performance of alternative strategies
- Trade-offs across management objectives
- Testing “multiple plausible realities”
- Sensitivity and robustness to known uncertainties (alternative reality scenarios)
- Identify monitoring and implementation priorities
- Explicitly participatory, iterative process
- Facilitates dialogue between decision-makers, stakeholders and science advisors
- A strategic risk assessment tool to test and select a management strategy that is most likely to meet the stated objectives of the Commission with a low risk of undesirable outcomes

Some challenges

- The MSE jargon ...
 - It costs additional resources, at least at the beginning
 - HS won't solve thorny allocation issues
 - Can be tricky for multi-species fisheries
 - Expectations of testing/adoption timelines
 - The yearly rhythm of tRFMO meetings -> patchy dialogue
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- How to go about it: Choose different components one-at-a-time to build the perfect car, or test different cars? There are many ways to go about it and they all need dialogue, work and patience

Some challenges

How to go about it: Choose different components one-at-a-time or all together?

The sequential approach (1):

- Adopt the limit
- Adopt the % of breaching the limit
- Adopt the target
- Adopt the HCR
- etc
- Test them; Start again?

The package approach (2):

- Choose several combinations of [limit, %risk, target, HCR, etc] and test them and choose the best one; Start again?

(1) Can be more stressful