

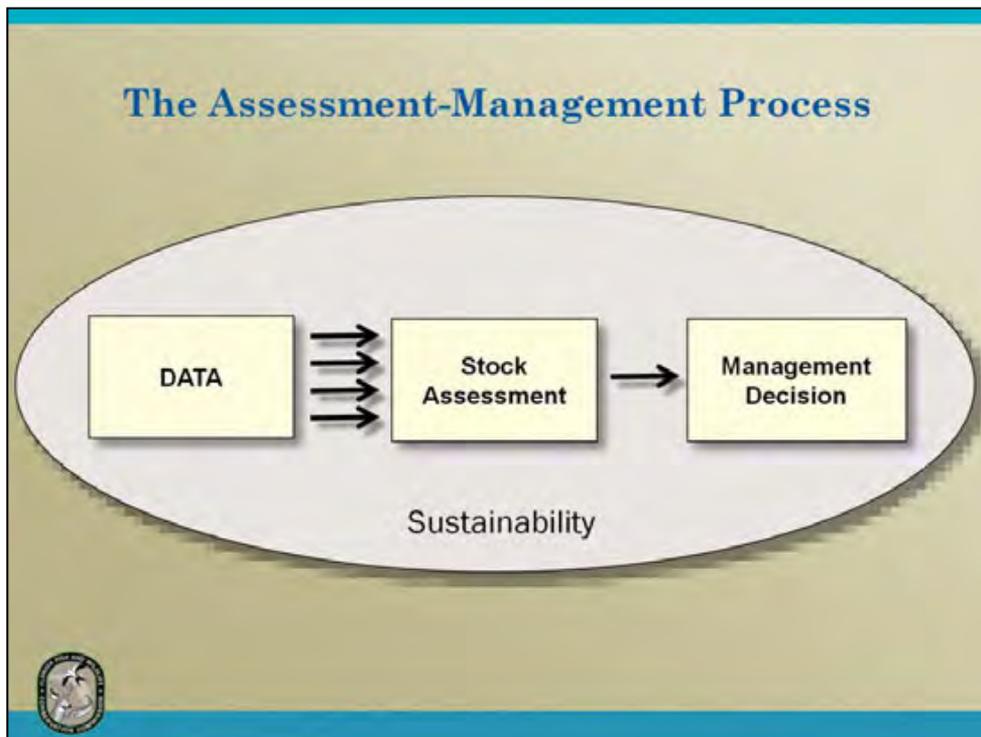
Fisheries Management Framework



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Florida Fish and Wildlife Conservation Commission
Fish and Wildlife Research Institute

This presentation gives a brief overview and discussion of the concept that stock assessments are conducted to measure the status of a fisheries stock relative to management reference points.

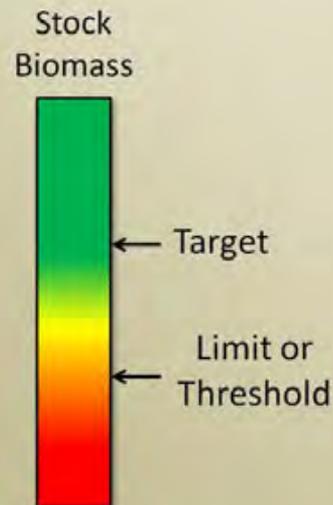


Stock assessments are periodically completed using the most current data and provide managers with a current picture of the fishery. We can think of the stock assessment process as a series of steps involving data collection, modeling/analysis and potential management actions based on the results of the stock assessment. These steps are all inter-dependent. The nature of the data available determines the type of model that can be used and different models are capable of calculating various management benchmarks such as Spawning Potential Ratio or SPR. All of these elements operate within policy and process constraints that further define the process. The most significant policy guidelines are spelled out in federal or state law regarding jurisdictional authorities, definitions of overfishing, and rebuilding schedules for certain stocks. More often than not, there are specific management benchmarks chosen for each stock that are designed to prevent overfishing.

The most informed stock assessments also involve significant stakeholder involvement in all stages of the work.

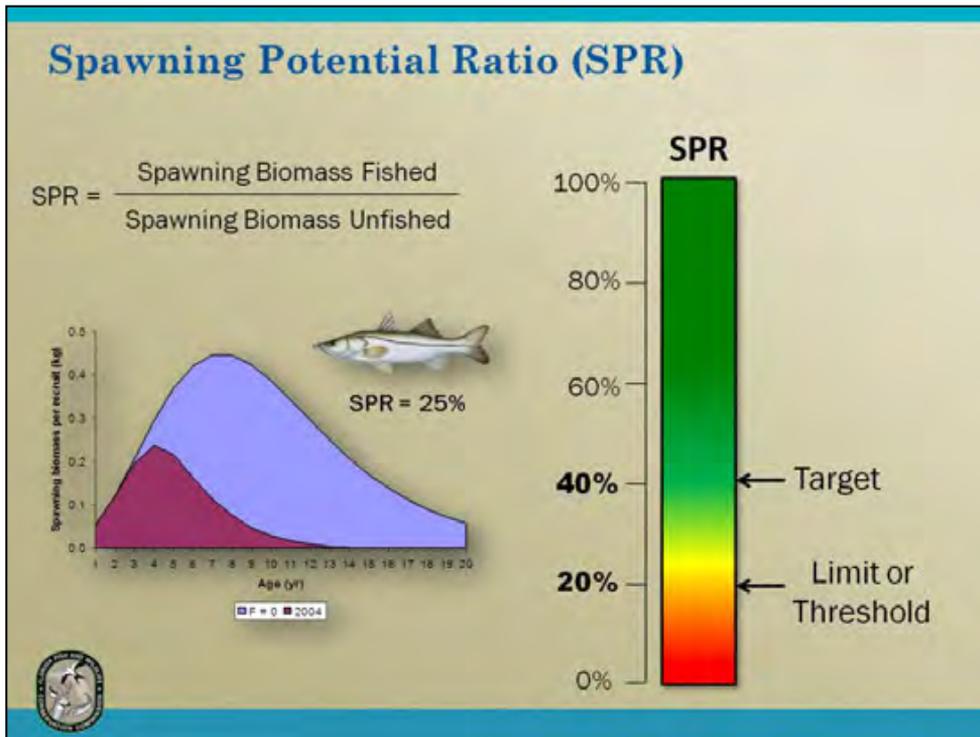
Management Reference Points

- Management Reference Points: are benchmarks for gauging the status of a stock.
- Target reference points: where managers want to be or are shooting for.
- Limit reference points: the maximum degree of safe exploitation. Line that's not really safe to cross...



The goal of fisheries management is to protect the resource while providing the greatest benefit to the users. When the users remove more from the population than can be replaced, we say that overfishing is occurring. Management reference points give decision makers guidance in determining whether populations are too small or fishing pressure is too great. They help provide targets for how large the population or how intense the fishing pressure should be.

Many managed fish stocks have two management benchmarks: limits or thresholds, where management action should be required to correct the situation; and targets, which are conditions that managers should strive for. Management thresholds are generated using biological benchmarks whereas management targets reflect additional social and economic considerations.

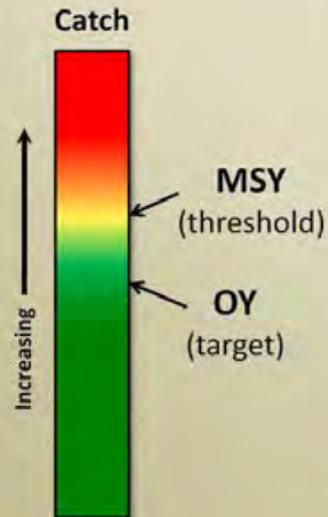


Spawning Potential Ratio or SPR is the ratio of the total biomass of mature fish (usually mature females) in a fished population to the total biomass that would exist if the population was not fished. Fishery managers work to ensure that this ratio is high enough to prevent biological decline.

The threshold SPR value is the percentage that you would not want the stock to drop below or the stock could experience recruitment overfishing. However, for many species a target SPR value is also specified. The target is set as a management goal based on what type of fishery you are managing for. For example, the target SPR value for snook is set at 40% SPR in order to manage that fishery for large, trophy snook. If a fishery drops below a target then management actions are usually initiated in order to prevent the stock from dropping below the threshold.

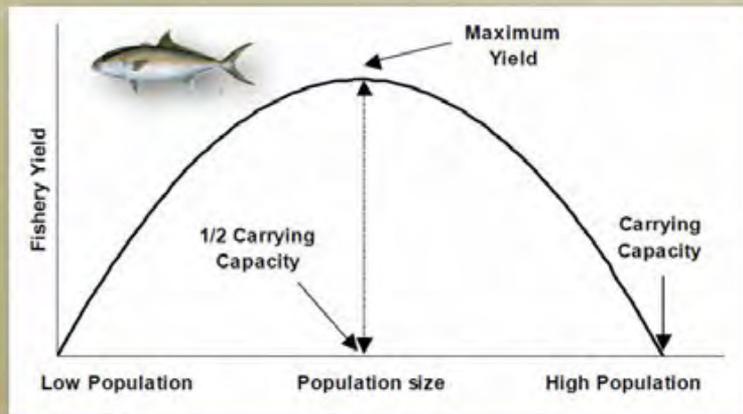
Other Reference Points

- Maximum Sustainable Yield (MSY): the largest long-term average catch or yield that can be taken from a stock.
- Optimum Yield (OY): a reduction from MSY to account for economic, ecological, and social factors.

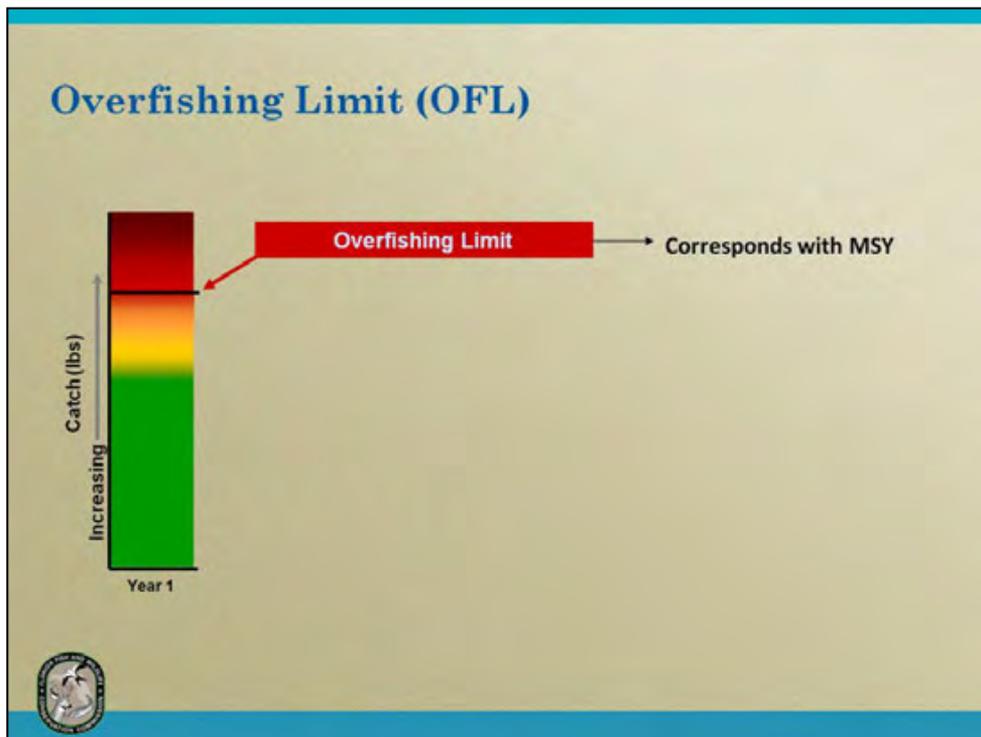


Other commonly used fisheries reference points are based on the concept of maximum sustainable yield (MSY). The maximum sustainable yield is typically thought of as the largest average catch that can be continuously taken from a stock under existing environmental conditions. That is, maximum sustainable yield is the greatest number of fish that can be caught each year without impacting the long-term productivity of the stock. Federal Fisheries Management Councils typically use MSY as the fisheries management threshold and optimum yield (OY) as the target.

The Concept of MSY



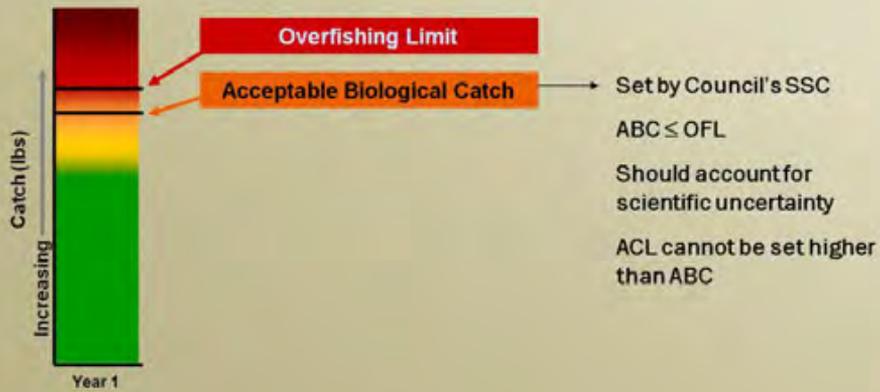
The theory of MSY is based on the idea that there is some limit to the size of the stock. At some point, due to habitat limitations, the availability of prey, or the presence of predators, a stock will reach an upper limit. This limit is called the carrying capacity. The MSY concept assumes that the growth rate for a stock is directly related to how close the stock is to reaching its carrying capacity. At very small stock sizes, the growth rate is unaffected by density-dependent forces and is equal to the intrinsic growth rate. As the stock moves closer to its carrying capacity, the mortality rate will increase or the net fecundity rate will decrease. When population is high (near the carrying capacity) there is little surplus production (too much competition). When population is low there is little sustainable yield (too few individuals to reproduce).



The Federal Fisheries Management Councils use a system of inter-related management benchmarks focused on achieving the fisheries management goals mandated by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as reauthorized in 2006.

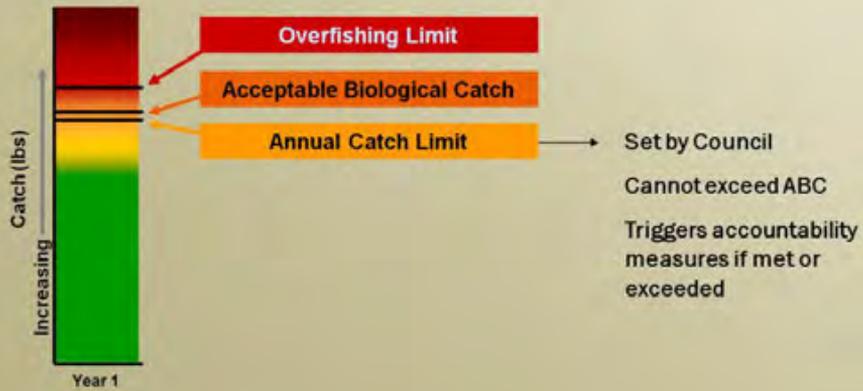
The Overfishing Limit (OFL) is an annual amount of catch that corresponds to the estimate of MSY (i.e., an output of the stock assessment). Annual catches exceeding OFL constitute overfishing.

Acceptable Biological Catch (ABC)



The Acceptable Biological Catch (ABC) is a level of a stock's annual catch that accounts for the scientific uncertainty in the estimate of OFL. The ABC should be set a level that is equal to or less than the OFL. ABC is determined by the Council's Scientific and Statistical Committee (SSC).

Annual Catch Limit (ACL)



The Annual Catch Limit (ACL) is the level of annual catch of a particular stock that can be caught in a given year (usually measured in weight). ACL is set by the Council and cannot exceed ABC.

Annual Catch Target (ACT)



The Annual Catch Target (ACT) is the level of annual catch that is the management target of the fishery. The distance between ACL and ACT should be based on the amount of management uncertainty for the fisheries in question.

In Summary

- Stock assessments are conducted to measure the status of a stock relative to management reference points.
- Reference points give decision makers guidance in determining whether populations are too small or fishing pressure is too great.

