

# Atlantic States Marine Fisheries Commission

## Risk and Uncertainty Policy Workshop

*February 8, 2018  
8:00 – 10:00 a.m.  
Arlington, Virginia*

### Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

- |                                                                                                                  |            |
|------------------------------------------------------------------------------------------------------------------|------------|
| 1. Welcome and Introduction ( <i>B. Beal/J. Gilmore</i> )                                                        | 8:00 a.m.  |
| 2. Workshop Objectives and Structure ( <i>J. McNamee</i> )                                                       | 8:05 a.m.  |
| 3. Instant Response Technology Tutorial                                                                          | 8:20 a.m.  |
| 4. Risk and Uncertainty Exercise: Defining Risk and Uncertainty in Striped Bass Management ( <i>J. McNamee</i> ) | 8:30 a.m.  |
| 5. Commission Risk Policy Status and Next Steps ( <i>J. McNamee</i> )                                            | 9:30 a.m.  |
| 6. Adjourn                                                                                                       | 10:00 a.m. |

The meeting will be held at the Westin Crystal City, 1800 Jefferson Davis Highway, Arlington, VA 22202



# Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201  
703.842.0740 • 703.842.0741 (fax) • www.asmf.org

## MEMORANDUM

TO: ISFMP Policy Board

FROM: Risk and Uncertainty Policy Workgroup

DATE: 10/5/16

SUBJECT: Recommended Decision-Tree Framework for Commission Risk and Uncertainty Policy

In the past, the Assessment Science and Management and Science Committees have attempted to develop a comprehensive risk and uncertainty policy for the Atlantic States Marine Fisheries Commission. This process has been revived as uncertainty becomes better understood and a standard element in scientific and management procedures. Recent management decisions emphasize the need to develop a policy to increase repeatability and transparency of our process. Uncertainty must be adequately accounted for in management decisions in order to meet management target levels, rebuild depleted stocks, and maximize resource utilization. When making fishery management decisions, the level of acceptable risk is ultimately a policy decision and should be clearly articulated to fishery stakeholders and other interested parties. Also, it has been increasingly noted that the lack of a risk policy leaves technical committees with unclear guidance on the acceptable level of risk to account for in their management recommendations. Risk and uncertainty policies have proven to be an effective tool for fishery management bodies to create decision-making accountability, and to maintain transparency throughout the management process by providing the necessary technical committee guidance to develop risk-based management recommendations. The Risk and Uncertainty Policy Workgroup has met several times to discuss the purpose, goals, and objectives of the Commission policy and develop a framework.

**Policy purpose statement:** *"The Commission recognizes that fishery information is inherently variable, and that successful management requires full consideration of this uncertainty and the associated risks on management decisions. The purpose of the Commission's Risk and Uncertainty Policy is to provide a consistent yet flexible mechanism to account for both scientific and management uncertainty in the Commission's decision making process in order to protect all Commission-managed stocks from the risk of overfishing, while minimizing any adverse social, economic, or ecosystem effects. This Policy seeks to maximize the long term benefits across all of our marine fishery resources by providing objective criteria to characterize both scientific and management uncertainty, and to evaluate management risk. Additionally, the Policy improves transparency in the management process, allowing for better communication among managers, industry, and other stakeholders."*

**Goal: Adequately account for uncertainty at all levels of the Commission's management process to maximize informed decision-making**

- Apply technical committee expertise to identify, and quantify where possible, sources of scientific uncertainty in the stock assessment process.
- Ensure that management uncertainty is captured in the stock assessment process or integrated into decision-making by utilizing knowledge of issues such as enforcement or non-compliance.
- Incorporate social and economic factors through application of current information and data while recognizing the need to develop more robust quantitative instruments.

M16-89

**Goal: Consistently manage Commission species**

- Apply across all Commission-managed species while incorporating nuances of each individual species.
- Provide stability with a standardized procedure that is predictable in process, although outcomes may not be predictable.
- Provide explicit guidance to the technical committee for specifying management recommendations that are in line with the Board's risk tolerance for all ASMFC-managed species.

**Goal: Provide transparency in Commission's risk-management process**

- Clearly articulate and document the sources of uncertainty and the potential repercussions of that uncertainty on management decisions to stakeholders and decision-makers.
- Specify where uncertainties are accounted for in the decision-making process.
- Create management-level accountability through explicit and documented reasoning during final risk acceptance process.
- Increase accessibility to and understanding of the decision-making process to promote better engagement with stakeholders and other interested parties.

**Goal: Incorporate flexibility in the Commission's risk-management process**

- Implement a standard policy for reviewing the process so there is an avenue to revisit the risk policy and procedures in the face of changing science and knowledge of different fish and fisheries.
- Account for uncertainty estimates that cannot be quantitatively assessed by allowing managers to accept a harvest level that is greater than or less than the level recommended by the technical committee through an explicit documentation of the departure from the quantitative advice, to achieve the risk objectives of the Commission.

A comprehensive risk and uncertainty policy would provide guidance on everything from choosing biological reference points to setting quotas for data poor species. The development of such a policy is the long-term goal of the Risk and Uncertainty Policy Workgroup, but the WG also recognizes the investment in time and resources it will take to bring such a comprehensive document to completion. This would require setting specific management objectives for each species and conducting a management strategy evaluation. Thus, the WG recommends that the development and deployment of the policy be implemented in phases, beginning with a decision tree approach that will allow the Commission to set acceptable risk levels when determining quotas for data-rich species.

The Commission frequently has to set quotas or harvest regulations with a goal of moving a population to, or keeping a population at, a sustainable level, which often is defined by a target and threshold. The management options to achieve this goal are usually evaluated through short-term projections. These projections take into account variability in recruitment, current status, growth, natural mortality, and/or other factors to determine a range of possible outcomes. A technical committee then evaluates what percent of projected outcomes are at or below the F threshold. This is a way of quantifying the risk of a harvest reduction or increase strategy with regard to the stock entering an overfishing state or an unsustainable population size, e.g. the lower the percentage of runs at or below the F target, the higher the risk of exceeding that target will be if the management program is implemented. Generally, smaller reductions or bigger increases will have a higher risk of failing to keep F at or below the target, and it is

the Board's responsibility to decide what level of risk they are willing to accept in these management decisions.

The level of acceptable risk will vary from situation to situation. For species that are not overfished and not experiencing overfishing, the Board may accept a higher risk level than for species that are overfished. Likewise, the Board may want to apply a lower risk level for species that do not have robust assessments, or robust data to support harvest policy analyses. Life history characteristics specific to a species being managed may also influence the process of determining risk tolerance. Establishing guidance on what level of risk the Commission is willing to accept in different situations will allow technical committees to work more efficiently and provide the advice the Boards need, and will allow the public greater clarity in understanding the process of how catch advice is developed.

One possible way of providing this advice would be a decision-tree. Each technical committee would review a series of questions as part of their terms of reference for the assessment regarding stock status and the quality of the assessment and/or other information about that species, and arrive at a Board approved pre-determined level of risk (i.e., the probability of overfishing or of exceeding the F target, and the probability of the stock becoming overfished or declining below the SSB target) that would be used to develop catch advice. For example:

- **Can the stock status be determined?**
- **Is the stock status overfished/depleted?**
- **Is overfishing occurring?**
- **Is SSB above the target?**
- **Is F below the target?**
- **To what degree are the major sources of uncertainty captured within the assessment?**
- **Is there a negative retrospective bias (i.e. underestimating F and overestimating B)?**
- **Is this a long-lived, slow-growing species that would be difficult to rebuild?**

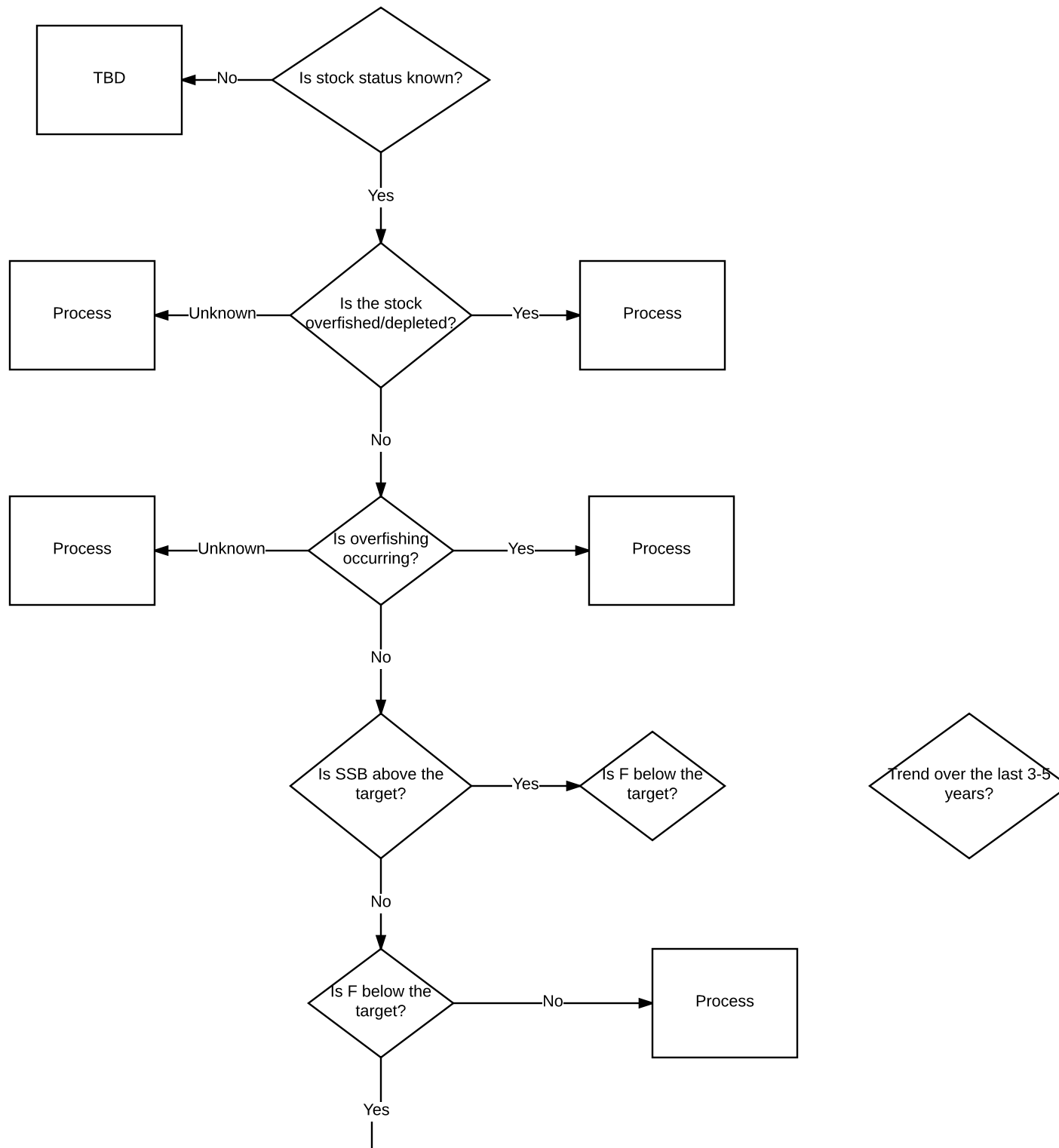
At the end of the decisions, a technical committee would know what probability of overfishing or becoming overfished to use in developing advice based on projections. These levels would be established through the overarching Commission risk policy for all species, but the application of this policy would still allow for some flexibility at the Board level. The Board may select a harvest reduction that is greater than or less than the level recommended by a technical committee to achieve the risk objectives of the Commission, but if they choose an alternate harvest reduction, they must be explicit about the level of risk they are assuming with regards to achieving the F target. This allows some flexibility for qualitative uncertainty estimates while still meeting the transparency and accountability goals of the Commission.

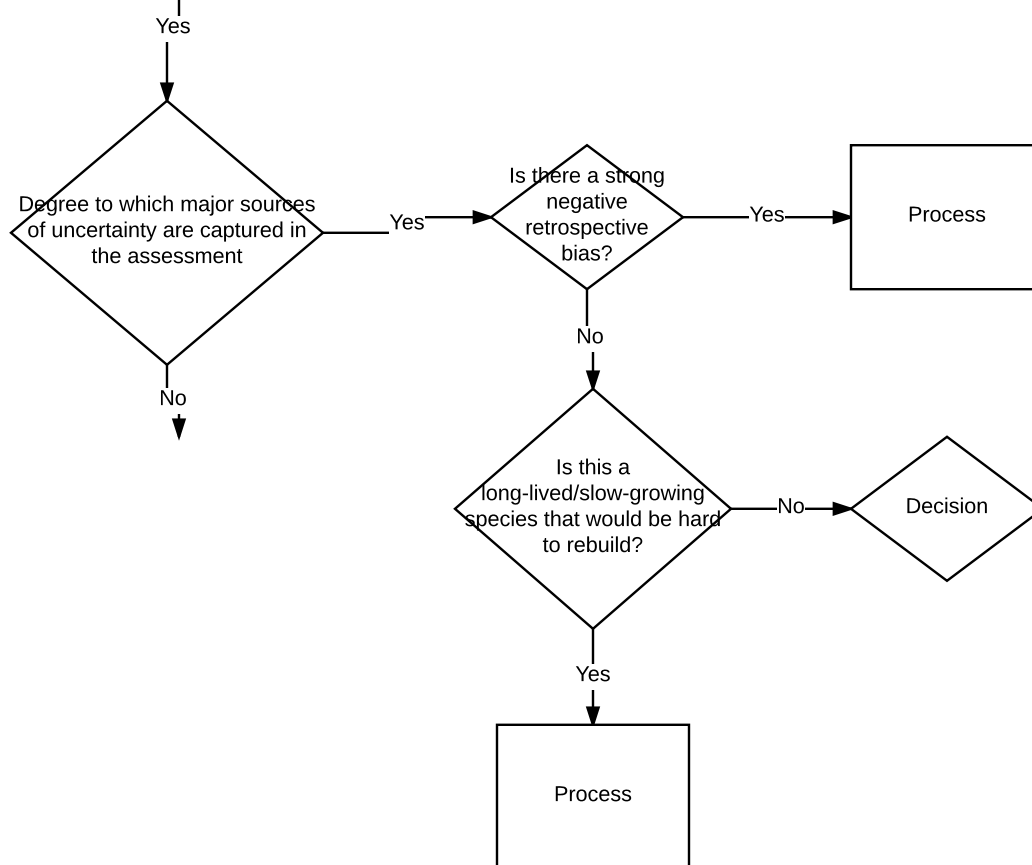
In September, the Risk and Uncertainty Policy Workgroup, met to discuss the development of the Commission's policy using a decision-tree framework. The group focused on populating a decision-tree using an example species that is fairly data-rich and therefore stock status could be determined. Quantitative and objective questions to assess the level of uncertainty surrounding a stock assessment and management process were incorporated into the decision-tree. All topics and questions that the group believed were more qualitative and subjective (either due to lack of data or general information) were placed into categories at the end of the tree. These categories could be used by the Board to describe their reasoning to flexibly change the risk level that the technical committees quantitatively assess and recommend beforehand. An informational document could be distributed to the Board that would hold some of the qualitative information in a more descriptive way. The group also recommended

creating a template for a formal Advisory Panel report that could provide additional information regarding some uncertainties, especially social science and economic concerns.

The WG added some “placeholder” levels of risk, using examples of Board queries from recent meetings but added some lower probabilities (30%, 40%, 50%, 60%, and 75% probability of being at or below F target). The group decided that stronger justification can come later from the Policy Board, ASC/MSC, and literature meta-analysis. For this example, the risk levels are disconnected from the rest of the chart since the WG did not create a quantitative measure to link them at this time. Giving each question an overall weight, and then scoring the questions relative to each other might make the process more quantitatively linked to each risk level for the final product.

The Workgroup is seeking feedback from the Board on acceptable levels of risk and what characteristics of the stock or the assessment would cause the Board to accept a higher or lower level of risk. Given that this rough draft of the decision-tree was created with only one example species, this is a small component of the final tool that will be the end product recommended to the Policy Board. Board members should consider if this framework is appropriate for accounting for risk and uncertainty in the Commission process.





**30% Probability of Being at or Below F Target**

**40% Probability of Being at or Below F Target**

**50% Probability of Being at or Below F Target**

**60% Probability of Being at or Below F Target**

**75% Probability of Being at or Below F Target**

Management Uncertainty

Socio-economic

Ecosystem

Climate

Habitat