

## NEW ENGLAND FISHERY MANAGEMENT COUNCIL

### **Report from the *RISK POLICY WORKING GROUP* November 2014 NEFMC Meeting**

The *Risk Policy Working Group* (RPWG) was originally formed by the New England Fishery Management Council (NEFMC, Council) as the *ABC Control Rule Working Group*, but the name change to *Risk Policy Working Group* more accurately reflects the working group's immediate tasking, i.e., to prepare a work plan addressing how the Council may proceed with developing a risk policy so that control rules for acceptable biological catch (ABC control rules, ABC CRs) can clearly and consistently incorporate the Council's risk tolerance. This Report summarizes the RPWG's progress towards developing a risk policy and includes a Draft Risk Policy Statement for the Council to review/approve at its September 30 – October 2, 2014 meeting.

***Risk Policy Working Group Membership:*** Mary Beth Tooley, Chairman (NE Council); David Pierce, Vice Chairman (NE Council); Matt McKenzie, Mike Sissenwine (NE Council); Demet Haksever, Lori Steele (NE Council staff); Steve Cadrin, Dan Georgianna, Jason McNamee, Patricia Pinto da Silva (SSC members); Jon Deroba (NEFSC); and Sarah Heil, Moira Kelly (NMFS GARFO).

#### **1.0 BACKGROUND**

The New England Fishery Management Council has not yet adopted a risk policy to apply across all of its managed stocks. In general, the Council has met its Magnuson-Stevens Act (MSA) requirements to establish annual catch limits (ACLs) and accountability measures (AMs) in all Fishery Management Plans (FMPs) and currently utilizes its SSC to recommend acceptable biological catch (ABC) levels that account for scientific uncertainty. However, without a risk policy, ambiguity in some of the Council's ABC control rules leaves its Scientific and Statistical Committee (SSC) with unclear guidance for recommending ABCs. For example, the SSC recently raised this issue when developing ABC recommendations for the 2013-2015 Atlantic herring fishery specifications (September-November 2012). The SSC suggested that the Council consider how to approach long-term management of the Atlantic herring fishery to ensure that the next time herring are assessed, an appropriate control rule could be created which meets the needs of the Council. Much of the SSC's discussion reflected a lack of clarity regarding the Council's risk tolerance as well as long-term management objectives for the fishery. Developing and adopting a formal risk policy for all Council-managed FMPs is therefore appropriate and would promote responsible management by improving clarity and consistency in the ABC-setting process.

The Council included the development of a risk policy on the list of management priorities for 2014. The Risk Policy Working Group (RPWG) has met several times during 2014 to draft a Risk Policy Statement for the Council to consider at its September 2014 meeting. If the Risk Policy Statement is approved by the Council, the RPWG will continue its work and begin to develop strategies for implementing and applying the risk policy statement across all Council-managed FMPs.

Early during its discussions, the RPWG agreed that the Council's risk policy should address both scientific uncertainty when setting ABC and management uncertainty when setting ACLs. This is reflected in the goals/objectives developed by the RPWG (Section 1.2) as well as in the terminology used in the Risk Policy Statement and throughout this document (see *Terminology* below). The RPWG recognizes that developing and implementing a risk policy across all Council-managed FMPs will be an iterative and relatively time-intensive process. The Draft Risk Policy Statement presented in this report represents the first major step in this process.

## 1.1 TERMINOLOGY

The Risk Policy Working Group recognizes the need to define the terms *risk policy*, *ABC control rule*, and *harvest control rule* and apply these terms in a clear and consistent manner throughout this discussion. The working group agreed that application of these terms should not deviate significantly from widely-accepted uses of these terms in literature. The ABC control rule (ABC CR) is defined in a relatively straightforward manner in the National Standard 1 Guidelines. The harvest control rule (HCR) is defined more broadly to reflect its wide application throughout many Fishery Management Plans (FMPs). In general, the HCR is a protocol for determining an output (catch) based on an input of recent data (ex., assessment, survey). In the Council's FMPs, HCRs are usually broader and more inclusive than ABC CRs and address rebuilding programs for stocks that become overfished. They can be even more inclusive as well and address other elements of risk/uncertainty. The RPWG offers the following:

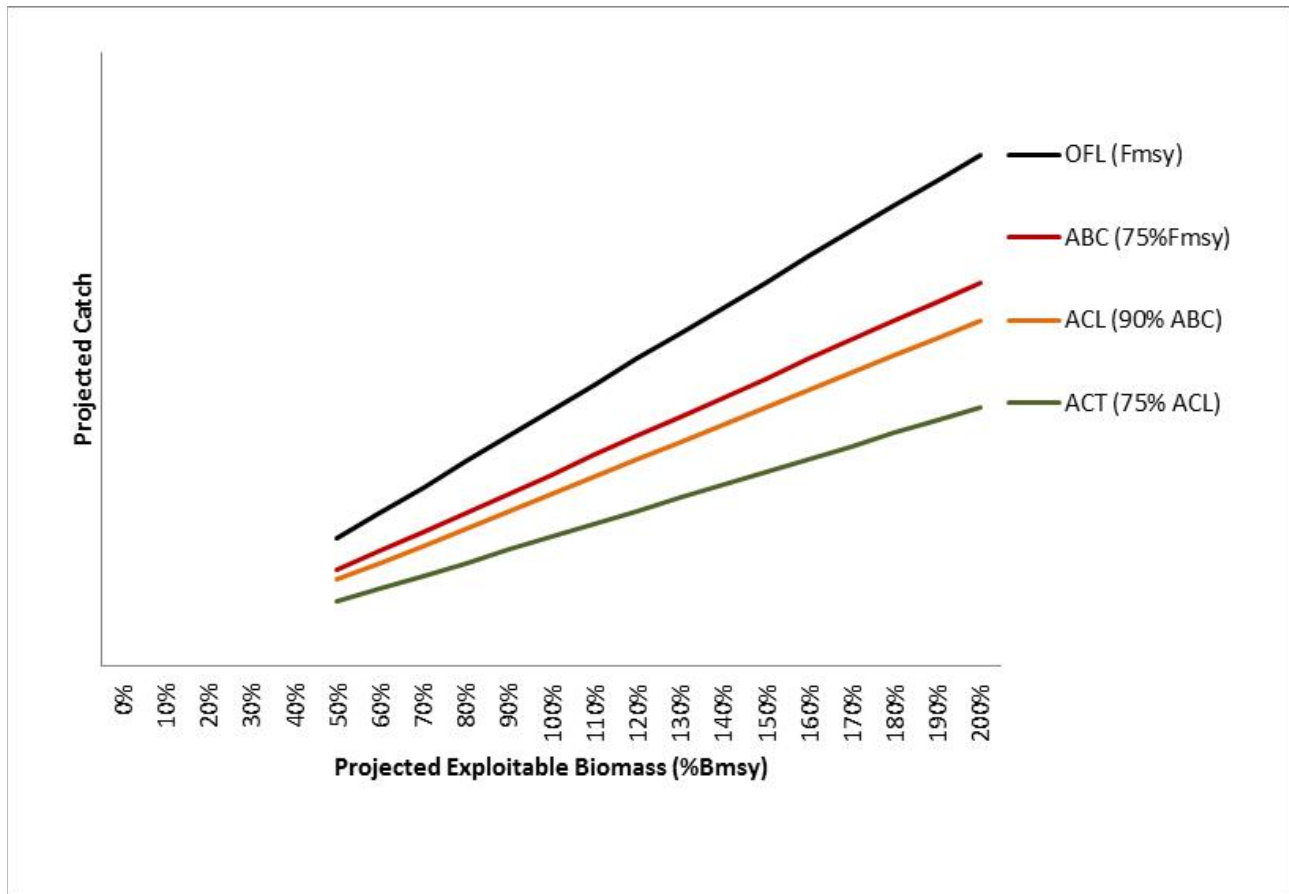
1. **Risk Policy:** Formal guidance to the SSC for specifying acceptable biological catch (ABC) levels for all NE Council-managed fisheries; universal policy to apply broadly across all FMPs that clearly reflects the Council's risk tolerance for overfishing a stock.
  - The risk policy is developed and adopted by the Council, with input from SSC and other technical groups.
2. **ABC Control Rule (ABC CR):** Provisions established by the Council intended to limit the probability of overfishing of a particular stock; provides guidance to the SSC regarding how far below the overfishing limit (OFL) to set ABC for a stock based on scientific uncertainty, stock status, and the Council's risk tolerance.
  - ABC CRs are utilized by the SSC, in combination with the Council's risk policy, to determine annual levels of ABC.
  - ABC CRs are species/stock-specific and are usually established in the respective FMPs (however, one ABC CR framework could be developed/applied across all FMPs).

- By law, the ABC CR cannot result in a probability of overfishing that is greater than 50%, but it may result in a probability that is less than 50% depending on the Council’s risk policy.

**3. Harvest Control Rule (HCR):** Stock-specific provisions for determining annual fishing mortality rates and yield; HCRs are based on established overfishing definitions and status determination criteria (reference points to determine “overfished/overfishing” status) and a prescribed approach to specify a target fishing mortality rate based on stock conditions.

- HCRs are species/stock-specific and are established in the respective FMPs.
- Complete HCRs may also include accountability measures and can be an important element of a management strategy evaluation (MSE).

**Figure 1 Hypothetical Control Rule that Determines OFL, ABC, ACL, and ACT**



*\*Note: A complete harvest control rule may prescribe catch when biomass < MSST (1/2 B<sub>MSY</sub>) and include AMs.*

## 1.2 RISK POLICY GOALS/OBJECTIVES

A risk policy complements ABC control rules and ACL-setting by articulating the bounds of how risk tolerant or risk averse a Council's management approach is, given certain criteria. Risk policies are intended to inform and work in conjunction with a Council's application of an ABC control rule and a harvest control rule. Though informed by scientific advice from the SSC, the Council's risk tolerance is ultimately a policy decision, and should be clearly articulated in a *Risk Policy Statement*, the elements of which can be applied through the ABC CRs and HCRs for individual stocks in each FMP. The RPWG developed the following goals and objectives for the Council's risk policy.

### Risk Policy Goals

1. Provide clear guidance to the SSC and the Council for specifying risk-based ABC and ACL levels for all fisheries managed by the Council.
2. Provide structure for accounting for risk that can be understood, interpreted, and applied.
3. Improve consistency and clarity in the process for setting ABCs and ACLs across fisheries.

### Risk Policy Objectives

- A. Clearly identify the Council's risk tolerance – articulate bounds for risk tolerance/risk aversion.
- B. Respond to different levels of uncertainty and stock condition.
- C. Improve scientific analysis and improve transparency associated with the interpretation of risk.
- D. Start simple, and be adaptable – evaluate performance and build in flexibility to revise/update risk policy based on new information, additional metrics (ex., stability, other social and economic factors, and ecosystem considerations), and/or new risks.

## 2.0 DEVELOPING A RISK POLICY STATEMENT

In April 2014, the RPWG agreed that developing and implementing a risk policy across all Council-managed FMPs should be a three-pronged approach involving:

1. Approval of a ***Risk Policy Statement*** (see draft below)
2. Development of a ***strategy*** for applying the Risk Policy Statement across FMPs (work in progress)
3. Development of a ***process*** for addressing individual FMP issues (work in progress)

The ***Risk Policy Statement*** is intended to be a high-level, broad articulation of the Council's general policy with respect to risk and uncertainty for setting ABCs and ACLs. The Draft Risk Policy Statement presented on the following page reflects the goals/objectives identified in Section 1.2 of this document (p. 4). The RPWG developed the Draft Risk Policy Statement over the course of several meetings and email discussions from April – August 2014. The SSC reviewed the Draft Risk Policy Statement at its August 25-26, 2014 meeting and provided related comments (see SSC Report from this meeting for more information). The RPWG reviewed the SSC feedback during a conference call on August 27, 2014 and agreed to make some minor edits to the Draft Risk Policy Statement, which are reflected below and discussed further in Section 2.1 of this document.

The three purposes identified in the Risk Policy Statement affirm the Council's intent to address risk and uncertainty across all elements of fisheries management by articulating a risk policy not only just for those entities involved in specifying ABC and related harvest levels (i.e., the Council and its subordinate bodies), but also for NOAA Fisheries (NMFS) in cases when it may implement in-season management measures/adjustments (as authorized) or when conducting rule-making independently from the Council, and for the Northeast Fisheries Science Center when performing analyses for Council-managed stocks in the future.

The four strategic approaches in the Risk Policy Statement articulate the policy to which the Council's harvest control rules and ABC control rules should adhere. As part of the next steps (Steps 2 and 3 above, see Section 2.2 for additional discussion), the RPWG will evaluate existing HCRs and ABC CRs for Council-managed stocks with respect to these strategic approaches (for example, does the existing HCR address risk at all elements of the fishery management process? How is stability considered in the HCR?) This evaluation should allow the RPWG to focus on individual FMP issues when developing a strategy/process for achieving the goal identified in the fourth approach, i.e., a dynamic process that allows for formal evaluation of HCRs aimed at extracting signal from noise, as well as an adaptive process that allows for modification when warranted.

## ***RISK POLICY STATEMENT (DRAFT)***

Recognizing that all fishery management is based on uncertain information and that all implementation is imperfect, it is the policy of the New England Fishery Management Council (Council) to weigh the risk of overfishing relative to the greatest expected overall net benefits to the Nation.

### **The purpose of the New England Fishery Management Council's risk policy is to:**

1. Provide guidance to the Council and its subordinate bodies on taking account of risk and uncertainty in Fishery Management Plans and specification-setting;
2. Communicate the priorities and preferences of the Council regarding risk and uncertainty to NOAA Fisheries; and
3. Make fishery management more transparent, understandable, and predictable while better achieving FMP objectives in the face of uncertain information and imperfect implementation.

### **This risk policy will be supported by the following strategic approaches:**

1. The Council's risk policy will take account of both the probability of an undesirable outcome and the negative impact of the outcome. The probability of outcomes that have a long-term negative impact on ecosystem function should be low.
2. The cumulative effects of addressing risk at all levels of the fishery management process (e.g., estimation of OFL, ABC, ACL, ACT, and setting accountability measures) will be taken into account.
3. Harvest control rules and management procedures will consider stability in the face of uncertain information and inherent variability in ecosystems.
4. Implementation of the policy will be analysis-based, using methods commensurate with the importance of tradeoffs between conservation, ecosystem roles, and fishery benefits, as well as the tradeoffs between short-term and long-term benefits. The goal should be harvest control rules and management procedures that are formally evaluated with a view towards extracting signal from noise so that management and fisheries are less sensitive to uncertainty. This goal should allow for a dynamic process of implementation and review, and modification when warranted.

## 2.1 DISCUSSION

The RPWG identified several issues related to the Risk Policy Statement, which require some additional discussion/clarification: (1) the term net benefits to the Nation; (2) the concept of stability as it relates to the Risk Policy Statement; and (3) the goal articulated in the fourth strategic approach – management procedure evaluation. Each of these issues is discussed in more detail in the following subsections.

### 2.1.1 Net Benefits to the Nation

In the Risk Policy Statement, the term *net benefits to the Nation* is interpreted broadly and inclusive of benefits not only to the target species/fishery in question, but also to bycatch species, habitat, and other benefits that may accrue from preventing overfishing. Fishery benefits are inclusive of the social, economic, and cultural benefits that accrue from healthy fish stocks. Furthermore, sustaining long-term benefits to the Nation – including food, jobs, recreation, and intrinsic values – is dependent on healthy marine ecosystems. This broad interpretation is consistent with the MSA discussion of *optimum yield and overall benefit to the Nation*:

*Optimum yield* is defined in the MSA as *the amount of fish which will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems*. This implies that there is value associated not only with how much fish may be caught, but also how the fish are utilized and protection afforded to marine ecosystems. Therefore, if outcomes are evaluated by yield only, then the “greatest overall benefits” to the Nation may not have been fully considered.

The factors that need to be taken into account in determining the greatest benefit to the Nation are addressed in more detail in several of the MSA's ten National Standards. The guidelines to *National Standard 1* describe that the benefits to the nation comprise of benefits to various users and to the economy. These include providing seafood to consumers; maintaining an economically viable fishery and utilizing the capacity of the Nation's fishery resources to meet nutritional needs, contributions to the local and national economy, the recreational fishing experience and non-consumptive fishery uses such as ecotourism, fish watching, and recreational diving. *National Standard 8* identifies the affected fishing communities as another social and economic group that should be taken into account in analyzing the benefits and costs of the fishery actions. The assessment of “net benefits to the Nation” as described in *National Standard 9* also takes into account the impacts not only for the fish stocks but also “... the impacts on the incomes accruing to participants both in directed fisheries and in fisheries that target the bycatch species as well as environmental consequences, recreational values; and impacts on other marine organisms.”

The fishery impact statements (FIS) as required by the MSA have some implications for evaluating benefits from the fishery and benefits on various user groups. Specifically, the FIS is required to include an assessment and description of the economic and social impacts of the proposed action on the various components of the fishery being managed, over the entire range of the regulated species, on participants in the fishery and in other fisheries, and on fishing

communities as well as the impacts on the safety of the participants in the fishery (Sec. 303 of MSA, Contents of Fishery Management Plans, (a)(9)).

Further guidance with respect to the measurement of net benefits is provided in Executive Order (E.O.) 12866, as this order specifies the requirements for analyses addressing the economic aspects of FIS and national standards. E.O. 12866 specifies that “in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages, distributive impacts; and equity), unless a statute requires another regulatory approach.”

Therefore, the definition of net benefits in E.O. 12866 is also consistent with the broad view of the net economic benefits recommended by RPWG although this executive order also includes distributive impacts and equity as parts of the net benefits.

***Language from NMFS’ National Standard 1 Guidelines (prevent overfishing, achieve optimum yield (OY)):***

The National Standard 1 Guidelines state that:

*Determining the greatest benefit to the Nation.* In determining the greatest benefit to the Nation, the values that should be weighed and receive serious attention when considering the economic, social, or ecological factors used in reducing MSY to obtain OY are:

- (A) The benefits of food production are derived from providing seafood to consumers; maintaining an economically viable fishery together with its attendant contributions to the national, regional, and local economies; and utilizing the capacity of the Nation’s fishery resources to meet nutritional needs.
- (B) The benefits of recreational opportunities reflect the quality of both the recreational fishing experience and non-consumptive fishery uses such as ecotourism, fish watching, and recreational diving. Benefits also include the contribution of recreational fishing to the national, regional, and local economies and food supplies.
- (C) The benefits of protection afforded to marine ecosystems are those resulting from maintaining viable populations (including those of unexploited species), maintaining adequate forage for all components of the ecosystem, maintaining evolutionary and ecological processes (e.g., disturbance regimes, hydrological processes, nutrient cycles), maintaining the evolutionary potential of species and ecosystems, and accommodating human use.

***Language from NMFS’ National Standard 8 Guidelines (Fishing Communities)***

The National Standard 8 Guidelines state that:

- To take into account the importance of fishery resources to fishing communities and address the sustained participation of the fishing communities that will be affected by the management measures, analysis should assess the likely positive and negative social and economic impacts of the alternative management measures, over both the short and the long term, on fishing communities.



- Any particular management measure may economically benefit some communities while adversely affecting others. Economic impacts should be considered both for individual communities and for the group of all affected communities identified in the FMP. Impacts of both consumptive and non-consumptive uses of fishery resources should be considered.

#### ***Language from NMFS' National Standard 9 Guidelines (Bycatch)***

The National Standard 9 Guidelines state that in their evaluation, the Councils must consider the net benefits to the Nation, which include, but are not limited to: negative impacts on affected stocks; incomes accruing to participants in directed fisheries in both the short and long term; incomes accruing to participants in fisheries that target the bycatch species; environmental consequences; non-market values of bycatch species, which include non-consumptive uses of bycatch species and existence values, as well as recreational values; and impacts on other marine organisms (50 CFR Section 600.350(d)).

#### ***Language from E.O.12866***

The objective of E.O. 12866 (58 FR 51735, October 4, 1993) is to improve the Federal regulatory system. One of the purposes of the Regulatory Impact Review (RIR) is to comply with the requirements of E.O. 12866. The regulatory philosophy of E.O. 12866 is reflected in the following statements:

Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages, distributive impacts; and equity), unless a statute requires another regulatory approach.

### **2.1.2 Stability**

The concept of *stability* is important to understand as it relates to developing a risk policy and addressing uncertainty/variability inherent in fisheries. Without explicitly identifying stability as an FMP objective in the Risk Policy Statement, the Risk Policy Working Group recognizes that the issue of stability cannot be decoupled from considerations of risk and uncertainty. There are many interpretations of stability as it relates to fisheries, risk, and fisheries management. The application of the term stability in the Draft Risk Policy Statement refers to *stability within fisheries management*, i.e., the ability to tailor the management system to respond to real change versus noise/variability.

The strategic approach proposed in the Draft Risk Policy Statement states that HCRs and management procedures will consider stability in the face of uncertain information and variability within fisheries systems. In other words, when developing rules to address risk and uncertainty, the rules should build from real signals and should not exacerbate variability in the system. The RPWG acknowledges that ecosystems are inherently dynamic and are never expected to be stable. While accepting this variability, the Risk Policy Statement is intended to avoid abrupt shifts in fisheries management, which may ultimately provide for more stable fisheries. As the risk policy is applied, stability should be achieved as management procedures (HCRs, ABC CRs, and other measures) can be structured to become less sensitive to scientific/management uncertainty and less reactive to changes that may be due to variability.

A different, but related application of the term stability refers to *stability within fisheries*, for example, the ability to reduce variability associated with annual catch/quota allocations for those participating in and/or dependent on the fishery. Stability within fisheries is an important issue and while not specifically addressed in the Risk Policy Statement, it should be considered on a case-by-case basis as part of the strategy to apply the Risk Policy Statement across Council-managed FMPs. In this sense, stability should be considered in terms of both the human aspects (including stability in employment and annual income for fishermen) and the marine resources/ecosystem (including protecting marine bio-diversity and stability of alternative species). Consideration of stability in fisheries as a part of the strategic approach for applying the Risk Policy Statement may involve evaluating the trade-offs (if any) between stability and achieving the greatest expected net benefits to the Nation.

### **2.1.3 Evaluation of Management Procedures – MSE**

An important element of the risk policy is that HCRs and management procedures be developed in a way that they can be formally evaluated in the context of uncertainty and designed to extract signal from noise. *Management strategy evaluation* (MSE) was discussed in detail by the RPWG as a desirable method to formally evaluate HCRs and management procedures, if/when resources may allow. Generally, MSE is a formally-accepted procedure to provide management advice (ex., ABC) where the inputs and methods are pre-specified. All of the baseline work for MSE is done through collaboration with stakeholders, thereby increasing the potential for buy-in at the outcome. While the initial development may be lengthy, once constructed, MSE can essentially run on “autopilot,” and flexibility can be incorporated into the process for future review/adjustments. The RPWG recognizes the importance of MSE and notes that MSE can be an important factor for evaluating the performance of a risk policy. The RPWG also notes that other multi-criteria methods (such as Optimal Control techniques) may be available in the future to evaluate the short-term and long-term trade-offs associated with various risk tolerance levels, the value of net benefits, and potentially other goals such as achieving greater stability in the fishery.

## 2.2 NEXT STEPS

The details of implementing and applying the Risk Policy Statement across each of the Council-managed FMPs will be part of the strategy developed during Step 2 and the process considered in Step 3. The strategy will be more detailed, more technical, and likely FMP-specific. As part of the strategy, it will be important to ensure that clear guidance is included to steer the SSC when recommending ABC. For example, the strategy could provide, at a minimum, a risk tolerance for p-star ( $p^*$ ) and a range within which tradeoffs (for example, precaution vs. foregone yield) could be considered. The strategy developed during Step 2 could include precursors for MSE as well. Factors related to evaluating tradeoffs and consequences could be incorporated into the strategy, technical/analytical needs relative to each FMP could be specified, and management/regulatory needs could be identified, allowing for the transition to Step 3.

The RPWG is currently developing a matrix/outline that will summarize baseline conditions associated with ABC CRs, HCRs, and risk tolerance for each FMP stock managed by the Council. The matrix (work in progress) will provide information to help the working group determine if/how the FMP is consistent with the Risk Policy Statement and whether modifications to HCRs, ABC control rules, or other FMP elements should be considered. This will form the basis of the strategy developed to address risk under each FMP. The RPWG matrix will provide summary information related to:

- Is the stock/fishery data rich or data poor?
- When was the last stock assessment completed/what kind of assessment?
- What is the basis for OFL?
- What is the ABC Control Rule?
- Major sources of uncertainty
- What are the steps that were taken to get from OFL to ACL or ACT?
- Is risk tolerance incorporated? If so, where/how?
- What is hard-wired into the FMP versus what is determined case-by-case?
- Recent performance of the HCR (against overfishing/overfished)
- Is the stock in a rebuilding plan?
- Data re. revenues, jobs, employment
- % food, % recreational opportunities in the fishery
- Interactions/linkages with other fisheries/stocks
- Available metrics for evaluating risk

The matrix of baseline conditions will be further developed by Council staff and GARFO staff for a future RPWG meeting. The next RPWG meeting is scheduled for November 5, 2014.