

## **BSAI Halibut Abundance-based PSC management workshop**

### **Identify measurable objectives and performance metrics for use in developing alternative management measures for BSAI halibut abundance-based PSC management**

**Thursday, February 2, 2017**

**1:00pm-5:00pm**

**Renaissance Hotel, 515 Madison St, Seattle, WA**

### **Summary**

In conjunction with the February Council meeting, the Council will hold a public stakeholder workshop on Thursday, February 2, from 1:00-5:00pm to solicit input to identify measurable objectives and appropriate metrics for the development of alternative management measures for BSAI halibut PSC limits. Per Council request, the inter-agency Abundance-Based Management (ABM) workgroup has translated the confirmed Council objectives into draft overarching goals to gather stakeholder input on these goals and associated measurable objectives and related performance metrics. At this workshop, the ABM working group will

- Provide an overview of the need for goals, measurable objectives and related performance metrics,
- Ask questions to assist in the development of measurable objectives and related performance metrics, and
- Solicit feedback on modifications or additions to these objectives and performance metrics.

### **Introduction**

Choosing between alternative management measures can be done by comparing how each alternative meets defined objectives. Therefore, it is important to define detailed objectives with measurable outcomes. This can be difficult, and should involve input from stakeholders and decision-makers. Typically, overarching goals are defined first and translated into measurable objectives, and there may be multiple measurable objectives for each goal. Sometimes it is helpful for analysts to ask stakeholders and decision-makers questions which can then lead to measurable objectives. For example, a question related to an overarching goal of “maintaining a healthy fish stock” may be “Is there a minimum spawning stock abundance that is desired?” which may lead to a measurable objective of “keeping the spawning stock above a certain abundance for a specified number of years with a specified probability.” This measurable objective has an outcome (“a certain abundance”), a time-frame (“a specified number of years”) and a probability or acceptable risk level. A performance metric can then be defined to evaluate whether or not a measurable objective has been achieved (e.g., the probability that the spawning stock abundance is above a certain level over a specific number of years).

### **Council Purpose and Need (adopted April 2016):**

“The current fixed yield based halibut PSC caps are inconsistent with management of the directed halibut fisheries and Council management of groundfish fisheries, which are managed based on abundance. When halibut abundance declines, PSC becomes a larger proportion of total halibut removals and thereby further reduces the proportion and amount of halibut available for harvest in directed halibut fisheries. Conversely, if halibut abundance increases, halibut PSC limits could be unnecessarily constraining. The Council is considering linking PSC limits to halibut abundance to provide a responsive management approach at varying levels of halibut abundance. The Council is considering abundance-based PSC limits to control total halibut mortality, provide an opportunity for the directed halibut fishery, and protect the halibut spawning stock biomass, particularly at low levels of abundance. The Council recognizes that abundance-based halibut PSC limits may increase and decrease with changes in halibut abundance.”

Council objectives inferred from the Purpose and Need for this action to form overarching goals:

1. Halibut PSC limits should be indexed to halibut abundance
2. Halibut spawning stock biomass should be protected especially at lower levels of abundance
3. There should be flexibility provided to avoid unnecessarily constraining the groundfish fishery particularly when halibut abundance is high
4. Provide for directed halibut fishing operations [in the Bering Sea].
5. Provide for some stability in PSC limits on an inter-annual basis.

These overarching goals in the attached tables were then used to formulate both questions for stakeholder feedback at this workshop as well as draft measurable objectives from which to derive performance metrics. These overarching goals may be in competition with each other. In order to best design and evaluate alternatives which can be compared in a future risk assessment to assist policy-level decision-making, specific measurable objectives for this action must be defined. As noted above, measurable objectives are best defined in conjunction with stakeholder input.

## Glossary of terms

**Council Objectives** A list of overarching goals for abundance-based halibut PSC management that were inferred from the Council's Purpose and Need Statement.

**Measurable Objective** An objective that can be specified explicitly (e.g., ensure the spawning biomass stays above a minimum threshold) and evaluated with a performance metric (e.g., ensure the spawning biomass stays above 20% of the unfished spawning biomass with 90% probability) which reflects and is linked to the Council objectives. Performance metrics are used to judge policy alternatives relative to these objectives.

**Threshold** A value or range of values that must be achieved to meet a measurable objective.

**Time Frame** There are two concepts here. The first is how far into the future is considered (e.g., short-term or long-term). The second is a range of years over which the measurable objective is to be evaluated.

**Performance Metric** Metric or statistic that is used to evaluate whether a measurable objective is achieved. Performance metrics are used in scientific analysis to gauge success in meeting measurable objectives.

### Other Terms:

**AAV** Average Annual Variability

**ABM** Abundance based management specifically for Pacific halibut

**Control Rule** A function relating a metric of stock status to a resulting management limit, such as a catch, fishing mortality, or effort limit

**BCR** Bycatch control rule; a control rule for setting the limit of a bycatch (PSC) species based on a specified metric of stock status

**PSC** Prohibited species catch (for halibut, synonymous with bycatch)

**SPR** Spawning potential ratio; the ratio of spawning biomass per recruit at a particular level of fishing mortality to the spawning biomass per recruit under an assumption of no fishing. Spawning biomass per recruit is the amount of future spawning biomass that can be expected as the result of a fish spawning over the course of its lifetime, assuming a particular level of constant fishing mortality.

**SSB** Spawning stock biomass

## References

- Cox, Sean P. and Kronlund, Allen Robert (2008). Practical stakeholder-driven harvest policies for groundfish fisheries in British Columbia, Canada. *Fisheries Research* 94: 224–237.  
<http://www.iphc.int/documents/MSAB/201306/Lightonthehill.pdf>
- Plagányi, É. E., Skewes, T. D., Dowling, N. a., & Haddon, M. (2013). Risk management tools for sustainable fisheries management under changing climate: A sea cucumber example. *Climatic Change*, 119(1), 181–197. <http://doi.org/10.1007/s10584-012-0596-0>
- Punt, A. E., Butterworth, D. S., de Moor, C. L., De Oliveira, J. A. A. and Haddon, M. (2016), Management strategy evaluation: best practices. *Fish Fish*, 17: 303–334.  
<http://onlinelibrary.wiley.com/doi/10.1111/faf.12104/abstract>
- Sainsbury, K., Punt, a. E., & Smith, A. D. M. (2000). Design of operational management strategies for achieving fishery ecosystem objectives. *ICES Journal of Marine Science*, 57, 731–741.  
<http://doi.org/10.1006/jmsc.2000.0737>
- Smith, A.D.M. 1994. Management strategy evaluation – the light on the hill. In *Population Dynamics for Fisheries Management*, pp. 249–253. Ed. by D. A. Hancock. Australian Society for Fish Biology Workshop Proceedings, Perth, 24–25 August 1993. Australian Society for Fish Biology, Perth.
- Smith, A. D. M., Sainsbury, K. J., & Stevens, R. A. (1999). Implementing effective fisheries-management systems – management strategy evaluation and the Australian partnership approach. *ICES J. Mar. Sci.* 56 (6): 967–979. <http://icesjms.oxfordjournals.org/content/56/6/967.abstract>