

Potential management objectives for north Pacific albacore proposed by Northern Committee member countries at WCPFC12, Kuta, Bali, December 1, 2015. Clarifications were drawn up by the ALBWG Chair, Dr John Holmes, and represent questions that may be discussed at the upcoming workshop in April 2016.

Proposed NC Member Objective	Some Clarifications Needed at April 2016 Workshop
Maintain spawning biomass above the Limit Reference Point ($20\%SSB_{current F=0}$)	<ol style="list-style-type: none"> 1. What is the acceptable level of risk of spawning biomass dropping below the LRP? Should it be minimal (e.g., only a 5% chance) or are you willing to accept more risk (e.g., 10, 15, 20%, etc.)? 2. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?
Maintain total biomass around its current level	<ol style="list-style-type: none"> 1. How is current level defined? Do you mean the estimated biomass in 2012 (last year of the current assessment) or the average of estimated biomass from a specific period such as 2008-2012 or some other measure? 2. What is the acceptable level of risk associated with achieving the current biomass level? 3. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?
Maintain the biomass, with reasonable variability, around its current level. Variability around the current level should take into account biomass changes related to regime shifts in the North Pacific Ocean as well as the effects of target switching in some fleets accessing north Pacific albacore.	<ol style="list-style-type: none"> 1. What biomass is of interest? Total, spawning, or some other component biomass? 2. How is current biomass level defined? 3. How is variability in biomass measured (e.g., coefficient of variation, $CV = sd/mean$, standard deviation (sd), RMSE, etc.)? 4. Variability in biomass related to decadal scale events such as regime shifts might be extreme relative to average conditions between regime shifts. Do you wish to consider different measures for regime shifts and conditions between regime shifts? 5. What is the acceptable level of risk associated with achieving the current biomass level? 6. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?

Prevent overfishing and recover rapidly from an overfished condition, should it occur	<ol style="list-style-type: none"> 1. This objective seems to be a policy statement and needs to be broken down into components that can be evaluated in the MSE process. 2. What are the overfishing and overfished thresholds? 3. How is rapid recovery defined?
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Maintain catch at average levels	<ol style="list-style-type: none"> 1. What length of time should be used to calculate average catch (5, 10, years, long-term 30 years)? 2. How will the average catch be calculated (using a specific range of years, e.g., 2008-2012, 1981-2010, or a specified number of yearsh, e.g., average catches in the most recent 5 years in the current stock assessment)? The latter approach may mean that the average catch level changes between assessments. 3. What is the acceptable level of risk associated with maintaining the catch at an average level? 4. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?
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Limit average annual variability (AAV) in catch	<ol style="list-style-type: none"> 1. How is variability in catch measured (e.g., coefficient of variation, $CV = sd/mean$, standard deviation (sd), RMSE, etc.)? 2. What is the proposed limit in annual variability (i.e., how much change in catch is permitted between years)? 3. What period of time is needed to estimate variability (e.g., 5 years, 10 years, other, etc.)? 4. What is the acceptable level of risk associated with achieving the the AAV in catch? 5. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?

<p>Limit average annual variability (AAV) in effort</p>	<ol style="list-style-type: none"> 1. How is effort estimated (e.g., gear specific such as vessel-days, pole-days, 1000s of hooks, etc., or some common measure among fleets such as number of vessels, etc.)? 2. How is variability in effort measured (e.g., coefficient of variation, $CV = sd/mean$, standard deviation (sd), RMSE, etc.)? 3. What is the proposed limit in annual variability (i.e., how much change in catch is permitted between years)? 4. What period of time is needed to estimate variability (e.g., 5 years, 10 years, other, etc.)? 5. What is the acceptable level of risk associated with achieving the the AAV in effort? 6. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?
<p>Move biomass towards a target reference point</p>	<ol style="list-style-type: none"> 1. Depending on the choice of target reference point, the stock may be above, below or at the target reference point at present. 2. What biomass is of interest (spawning, total, some other component)? 3. What is the target reference point (note that in many applications a target reference point is specified in terms of fishing mortality rather than biomass)? 4. What period of time (in years) should be considered to move from current biomass to the target reference point biomass? 5. What is the acceptable level of risk associated with moving biomass to the target reference point? 6. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?
<p>Ensure long-term conservation and sustainable catch of North Pacific albacore by achieving an optimum level of average yield taking into account economic, social, and ecological factors (including long-term economic and social benefits to the various North Pacific albacore fishery participants)</p>	<ol style="list-style-type: none"> 1. This objective seems to be a policy statement and needs to be broken down into components that can be evaluated in the MSE process. 2. Economic, social, and ecological factors need to be specified 3. Economic and social benefits desired for fishery participants would need to be specified. 4. Optimum level of annual yield is a judgement that must be made by managers. It cannot be evaluated with an MSE process unless the criteria defining optimum are specified in advance. 5. What does long-term mean (i.e, 10 years, 20 years, 30 years, etc.)?

Ensure a stable supply of high-quality North Pacific albacore

1. This objective also seems to be a policy statement and needs to be broken down into components that can be evaluated in the MSE process.
2. What does stable mean (some of the objectives listed above related to AAV and catch may address this point)?
3. How is fish quality assessed (e.g., high condition factor, high weight, fat content, etc.)?
4. What period of time (in years) should be considered to move from current biomass to the target reference point biomass?
5. What is the acceptable level of risk associated with achieving a stable supply of high-quality fish?
6. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?

Maintain current fishing effort in targeting and non-targeting fisheries.

Consider the implications of shift in effort from SPALB if those fisheries are uneconomical.

1. How is effort estimated (e.g., gear specific such as vessel-days, pole-days, 1000s of hooks, etc., or some common measure among fleets such as number of vessels, etc.)?
2. How is current effort measured (e.g., 2012 effort – last year in current stock assessment, average of last five years in the current assessment, average of 2002-2004, etc.)?
3. How would this objective apply to a fleet that does not target albacore but captures albacore as a valued non-target species?
4. What is the acceptable level of risk associated with achieving this objective?
5. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?

Maintain current catches in targeting and non-targeting fisheries

1. How is current catch measured (e.g., 2012 catch – last year in current stock assessment, average of last five years in the current assessment, average of 2002-2004, etc.)?
 2. How would this objective apply to a fleet that does not target albacore but captures albacore as a valued non-target species?
 3. What is the acceptable level of risk associated with achieving this objective?
 4. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?
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Maintain current fishing effort in targeting fisheries

1. How is current catch measured (e.g., 2012 catch – last year in current stock assessment, average of last five years in the current assessment, average of 2002-2004, etc.)?
2. What is the acceptable level of risk associated with achieving this objective?
3. Over what simulated period of time (in years) should we collect data in order to evaluate whether this objective is being achieved or not?

Equitably distribute the “conservation burden” among members. (Conservation burden may be assessed in terms of revenue foregone and costs incurred because of management restrictions and requirements.)

1. This objective seems to be a policy statement and needs to be broken down into components that can be evaluated in the MSE process.
 2. Equitable distribution of costs and benefits is a judgement that must be made by managers. It cannot be evaluated with an MSE process unless the criteria defining equitable and the distribution of costs and benefits are specified in advance.
 3. Implementation of this statement as an objective will require the development of a bioeconomic model for north Pacific albacore fisheries.
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