Introduction

The ISC’s Albacore Working Group has been tasked with developing a management strategy evaluation (MSE) for North Pacific albacore tuna. Results from the MSE will help inform ongoing development of the precautionary management framework adopted by the Northern Committee in 2014. At NC11 it was agreed that by November 19 members would submit proposals for the MSE based on a template provided by the ISC Albacore Working Group Chair. The NC plans to meet on the margins of WCPFC 12 to agree on an NC proposal to be submitted for consideration at the ISC North Pacific albacore workshop planned for April 2016 in Yokohama, Japan.

The Pacific Council plans to submit recommendations through the U.S. delegation based on past recommendations and the outcome of an advisory body webinar.

This paper contains initial concepts for a range of management strategies that could be evaluated. These strategies are described consistent with Table 1 in *Attachment 4 to the Report of the Albacore Working Group Workshop, 20-22 April 2015*, National Research Institute of Far Seas Fisheries Shimizu, Shizuoka, Japan (Annex 8 to the Report of the Fifteenth Meeting of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean). We understand that this table will serve as the basis of the template for submissions.

**Status Quo (CMM 2005-03, NC Precautionary Management Framework)**

**Objectives**

The management objective for the NP albacore fishery is to maintain the biomass, with reasonable variability, around its current level in order to allow recent exploitation levels to continue and with a low risk of breaching the Limit Reference Point.

**Thresholds/Reference Points**

- The Limit Reference Point (LRP) for this stock is established at 20%SSBcurrent F=0.
- The Target Reference Point (TRP) for this stock will be determined following a comprehensive analysis, if appropriate, under a Management Strategy Evaluation (MSE) approach

**Harvest Control Rules**

- The total level of fishing effort for North Pacific albacore … north of the equator shall not be increased beyond 2002-2004 levels; effort limits assigned to national fleets based on baseline period level (Also see WCPFC-NC11-WP-02)
- In the event that, based on information from ISC, the spawning stock size decreases below the LRP at any time, NC will, at its next regular session or intersessionally if warranted, adopt a

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1 Definition of “current” agreed to by the NC.
2 This should be interpreted to deter new entrants in the fishery that were not fishing for NP albacore during the baseline period.
3 A comparable measure adopted by the IATTC means that this effort limit applies throughout the North Pacific.
reasonable timeline, but no longer than 10 years, for rebuilding the spawning stock to at least the LRP and recommend a CMM that can be expected to achieve such rebuilding within that timeline. NC will take into account historical fishing activity and the source of increased fishing mortality when developing management strategies to rebuild the stock, including in establishing effort reductions. NC will further consider socio-economic factors, as per UNFSA Article 6.3.c., as well as which NC members, if any, contributed to exceeding the LRP.

Risk Tolerance
Not Specified


Objectives

- Maintain the long-term conservation and sustainable catch of North Pacific Albacore (NP Albacore) by implementing precautionary fishery management strategies that significantly reduce the risk of overfishing; provide for rapid recovery from an overfished condition, should it occur; and achieve an optimum level of average yield relative to the biologically sustainable maximum.
- Implement harvest strategies that are robust with respect to scientific and management uncertainty.
- Establish measures to facilitate rapid and successful implementation of any necessary future management actions, in an equitable manner to all Members, Co-operating Non-Members, and if appropriate, Participating Territories (CCM) fishing for NP albacore or incidentally taking NP albacore, and in a manner that provides a disincentive to any CCM that does not comply with the provisions of this APMA.
- Maintain and support long-term economic and social benefits to the various NP albacore fishery participants of CCMs.
- Provide a long-term, stable supply of high-quality NP albacore to consumers.
- Implement measures to adequately account and manage for total fishery related mortalities, including directed and incidental fishery impacts, including discarded fish not landed.

Thresholds/Reference Points

- \( F_{\text{LIMIT}}: F_{20\%}. \)
- \( F_{\text{CURRENT}} \) (This would likely be the terminal years used to define \( F_{\text{CURRENT}} \) in the most recent stock assessment.)
- \( F_{\text{TARGET MAX}} \), a precautionary buffer (see Control Rules below).
- \( B_{\text{LIMIT}}: SSB_{\text{MSY}}. \)

Harvest Control Rule

- While \( F_{\text{TARGET}} \) is intended to approximate \( F_{\text{CURRENT}} \), it would be based on a reduction from \( F_{\text{LIMIT}} \) that reflects an acceptable level of risk (uncertainty) that overfishing would occur
• This approach would be implemented separately for each national fleet based on their fishery impact (“partial F” or contribution to fishing mortality on the stock)
• Each CCM would be obligated to constrain fishing mortality of their fleets in line with their fishery impact, the precautionary reduction, and current stock status
• Each CCM would determine the particular management measures, whether catch or effort based, necessary to manage fishing mortality

Risk Tolerance

• ≤50% likelihood that overfishing (F>FLIMIT) would occur in any one year over 30 years.
• ≤50% likelihood that the stock would become overfished (SSB>SSBLIMIT) over 30 years.

Risk Averse Proposal

Objectives

• Manage for a low probability of overfishing (F > FLIMIT)
• Manage for a low probability the stock becomes overfished (B < BLIMIT)
• Avoid TAC below the 25th percentile of catches 1985-2014 (58,812 mt)

Thresholds/Reference Points

• FLIMIT: F20%
• B_{LIMIT}: 20% of unfished biomass

**Harvest Control Rule**

**Effort based:**
- The total level of fishing effort for North Pacific albacore … north of the equator shall not be increased beyond 2002-2004 levels; effort limits assigned to national fleets based on baseline period level

**Catch based:**
- If F > F_{LIMIT} in any management period, CCMs are obligated to adopt measures to reduce the relative impact of their national fleets on the stock so that F < F_{LIMIT} in the next management period
- If S_{Bcurr} ≥ 2.0S_{B-limit}, TAC for the subsequent three years set to correspond to F-target at S_{Bcurr}
  If S_{Bcurr} < 2.0S_{B-limit}, TAC for the subsequent three years set to correspond to F-target \times (0.5S_{Bcurr}/S_{B-limit}) at S_{Bcurr}

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**Risk Tolerance**

- \leq 40% likelihood that overfishing (F > F_{LIMIT}) would occur in any one year over 30 years.
- \leq 25% likelihood that the stock would become overfished (SSB > SSB_{LIMIT}) over 30 years.

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\(^4\) A management period could be one to three years depending on the frequency of stock assessments and assessment updates.
Rick Tolerant Proposal

Objectives

- Maintain fishing opportunity at or above the 1985-2014 average catch (72,303 mt)
- Moderate risk that the stock will become overfished

Thresholds/Reference Points

- $F_{TARGET}$: F15%
- $B_{LIMIT}$: 10% of unfished biomass

Harvest Control Rule

Effort based:
- If $SB_{curr} \geq SB_{LIMIT}$, TAE for subsequent three years set to correspond to $F_{target}$
- If $SB_{curr} < SB_{LIMIT}$, TAE for subsequent three years set to correspond to ($F_{target}$*$SB_{curr}$)/$SB_{LIMIT}$
- Fishing effort defined as vessel days fishing for NP albacore (NP albacore ≥ 50% of total catch on a daily basis); fleet specific relationship between vessel days and $F$ developed by ISC and agreed to by NC to operationalize TAE-based management approach

Risk Tolerance

- ≤60% likelihood that overfishing ($F > F_{LIMIT}$) would occur in any one year over 30 years
- ≤50% likelihood that the stock would become overfished ($SSB > SSB_{LIMIT}$) over 30 years