Multi-Species Implications of Reference Points

What might a target reference point of 50% SBF0 for skipjack tuna mean for bigeye and yellowfin tuna?

MOW3-WP/05

SPC, OFP

MOW3 Meeting, Apia, Samoa
Friday 28th November 2014

Introduction

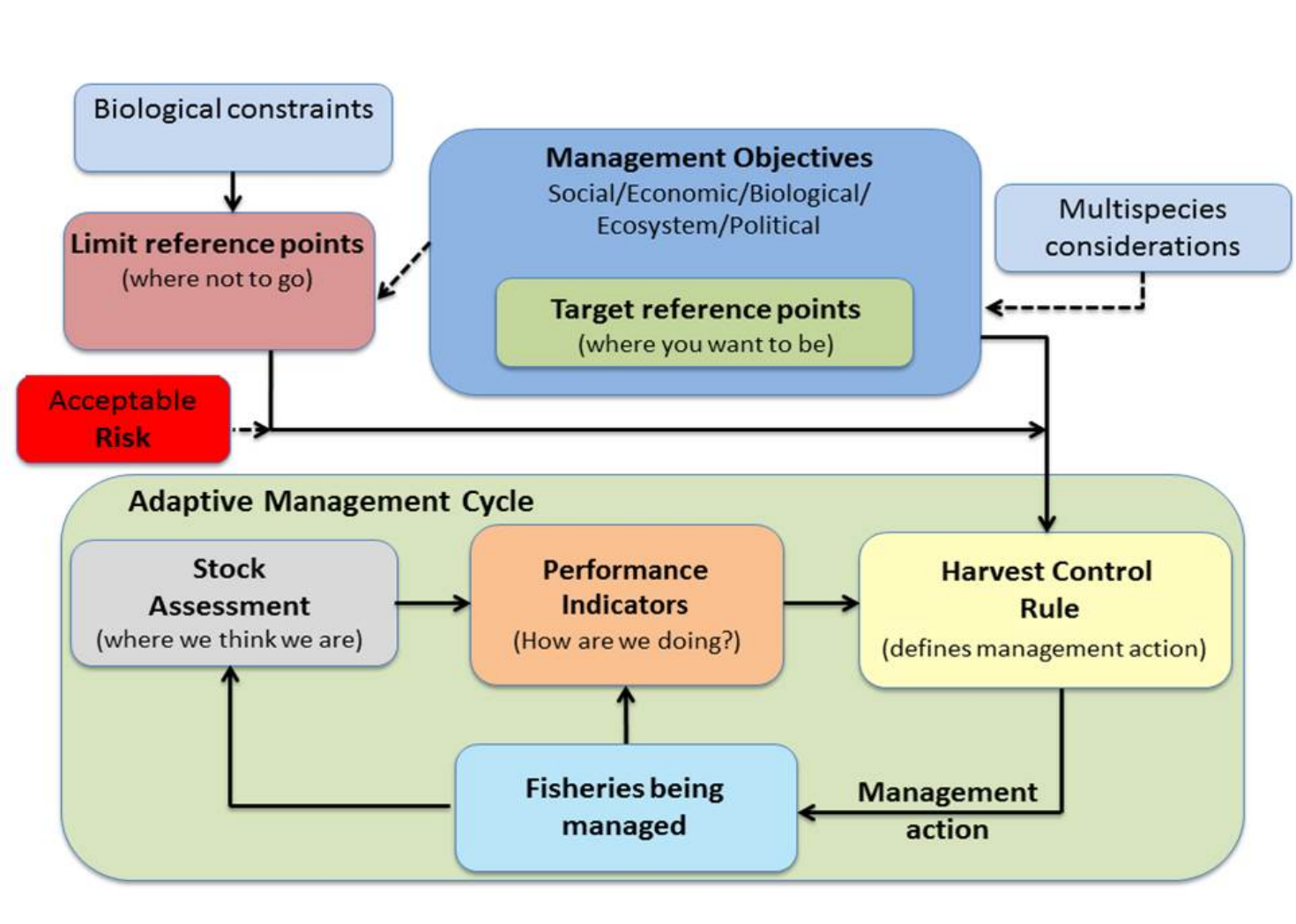
Background

- Skipjack, bigeye and yellowfin tuna are caught together throughout the Western Central Pacific Ocean, but the proportion of each species in the catch varies for different fisheries. Consequently, management measures that are designed around a target reference point (TRP) for one species may not be compatible with the reference point levels for other species

Aims

- Highlight the importance of multi-species impacts when considering target reference points and [later] harvest control rules in WCPO fisheries;
- Motivate the need for analyses both biological and economic to assist in this wider process; and
- Support WCPFC11s consideration of a TRP for skipjack tuna and the development of management measures for the three tropical tuna stocks.

Management Framework



Approach

Basis

- 20 year deterministic projections (2012-2032)
  - Constant recruitment (mean of last 10 years)

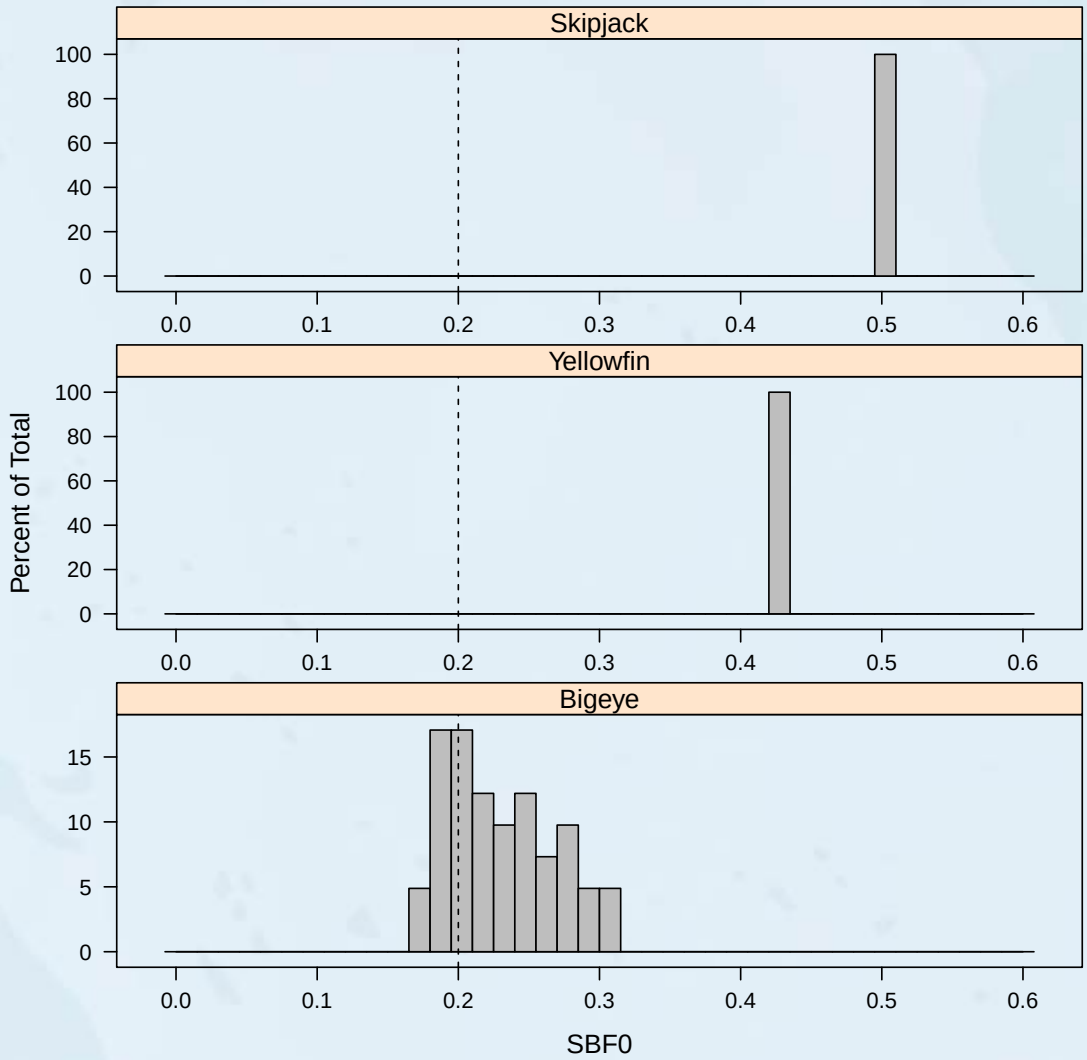
Methods

1. Projections for skipjack run over a grid of effort scalers to find those effort combinations that achieve 50% SBF0
   - Effort scalers ranged between 0.5 and 2.0
   - Of which, 41 effort combinations were selected that achieved 50% SBF0
   - Scalers applied only to Associated and Unassociated Purse Seine effort

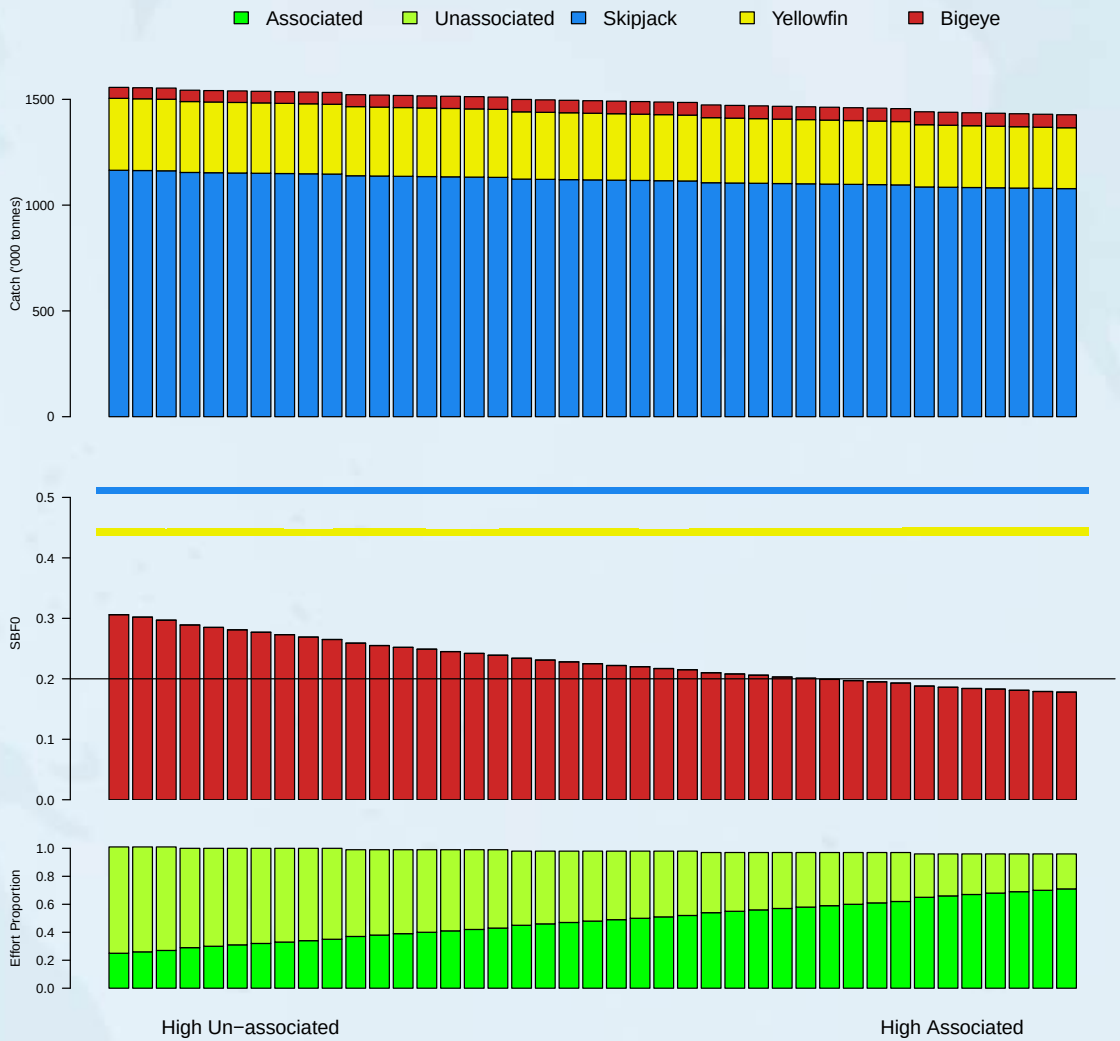
2. Projections for yellowfin and bigeye using those 41 effort scaler combinations

3. Calculate yield and SB/SBF0 at the end of the projection period

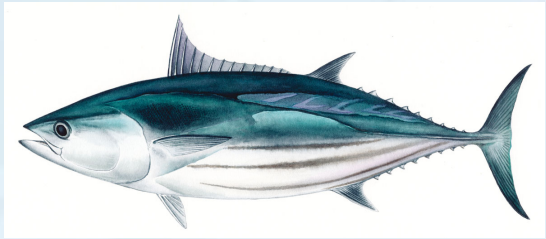
Distribution of SBF0

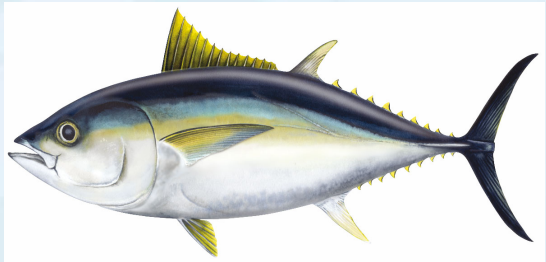


Yield and SBF0



Results





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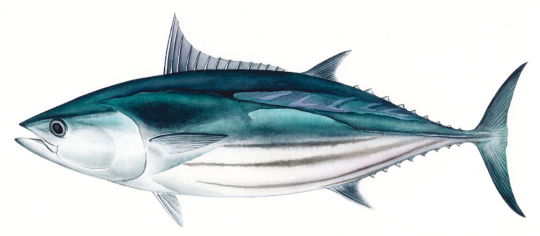

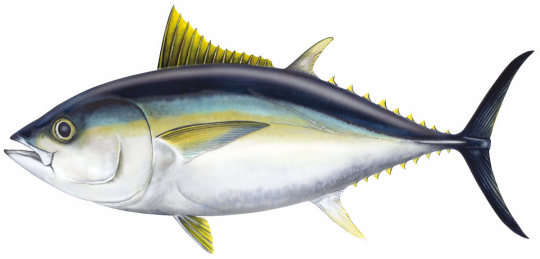

1. **Skipjack:**
   There are many combinations of FAD and free-school purse seine effort that are consistent with achieving the candidate skipjack TRP of 50% SBF0 and these are close to 2012 overall purse seine effort levels

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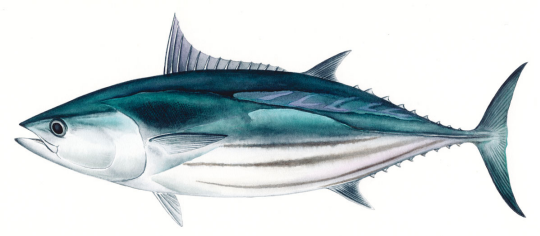

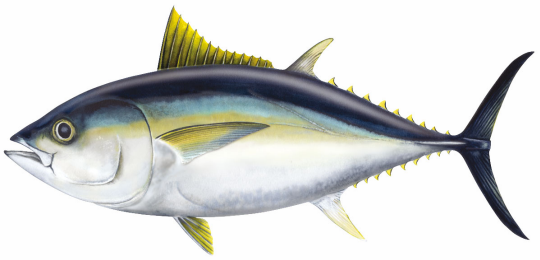

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   Yellowfin tuna stocks are predicted to remain at or above current levels across the range of combinations of purse seine effort compatible with the skipjack TRP.

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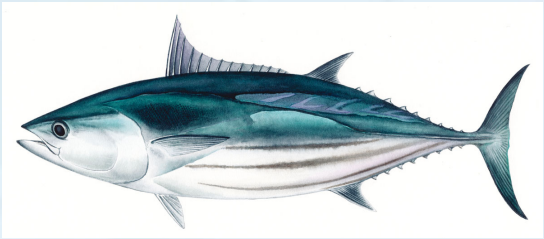

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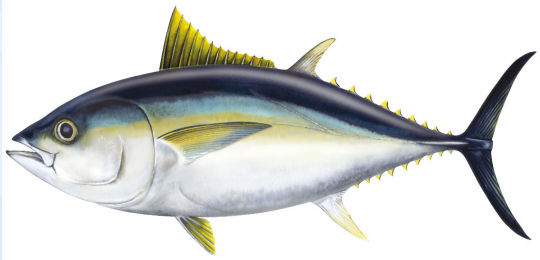

3. **Bigeye:**
   The impacts for bigeye tuna are sensitive to the mix of FAD and free-school effort only some combinations (with higher free-school proportions) would allow the bigeye stock to remain above its limit reference point.

Discussion

1. Have we captured the key multi-species impacts for consideration of a skipjack TRP?

2. What other factors may need to be considered?

3. How might sustainability concerns over bigeye and yellowfin be incorporated into management strategies for skipjack