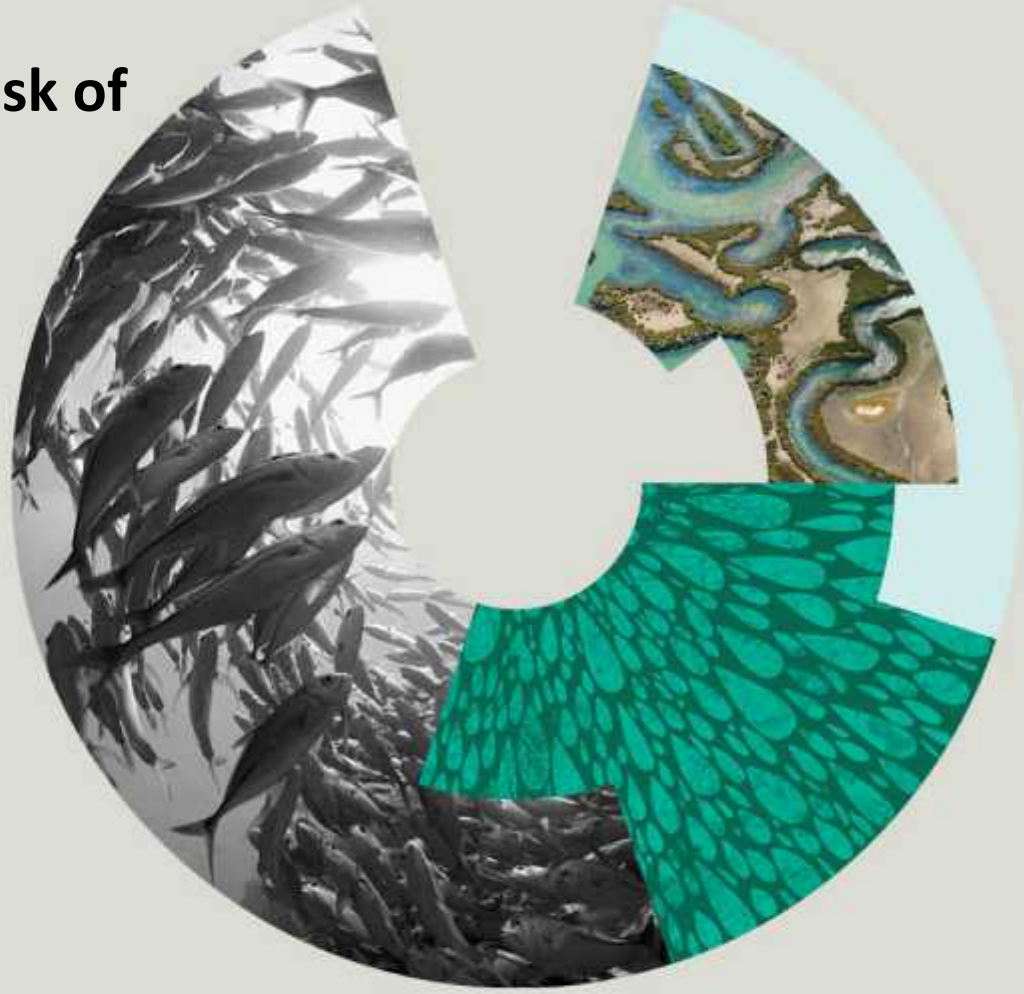
Australian Government
Department of Agriculture

Acceptable levels for the risk of breaching limit reference points

Background and summary of scientific advice.



WCPFC-HSW-2015
Agenda Item 4

James Larcombe

Nov-Dec 2015

Purpose

Provide some background and a summary of scientific information to assist WCPFC in adopting acceptable levels of risk for breaching limit reference points for the key tuna species in the WCPO.

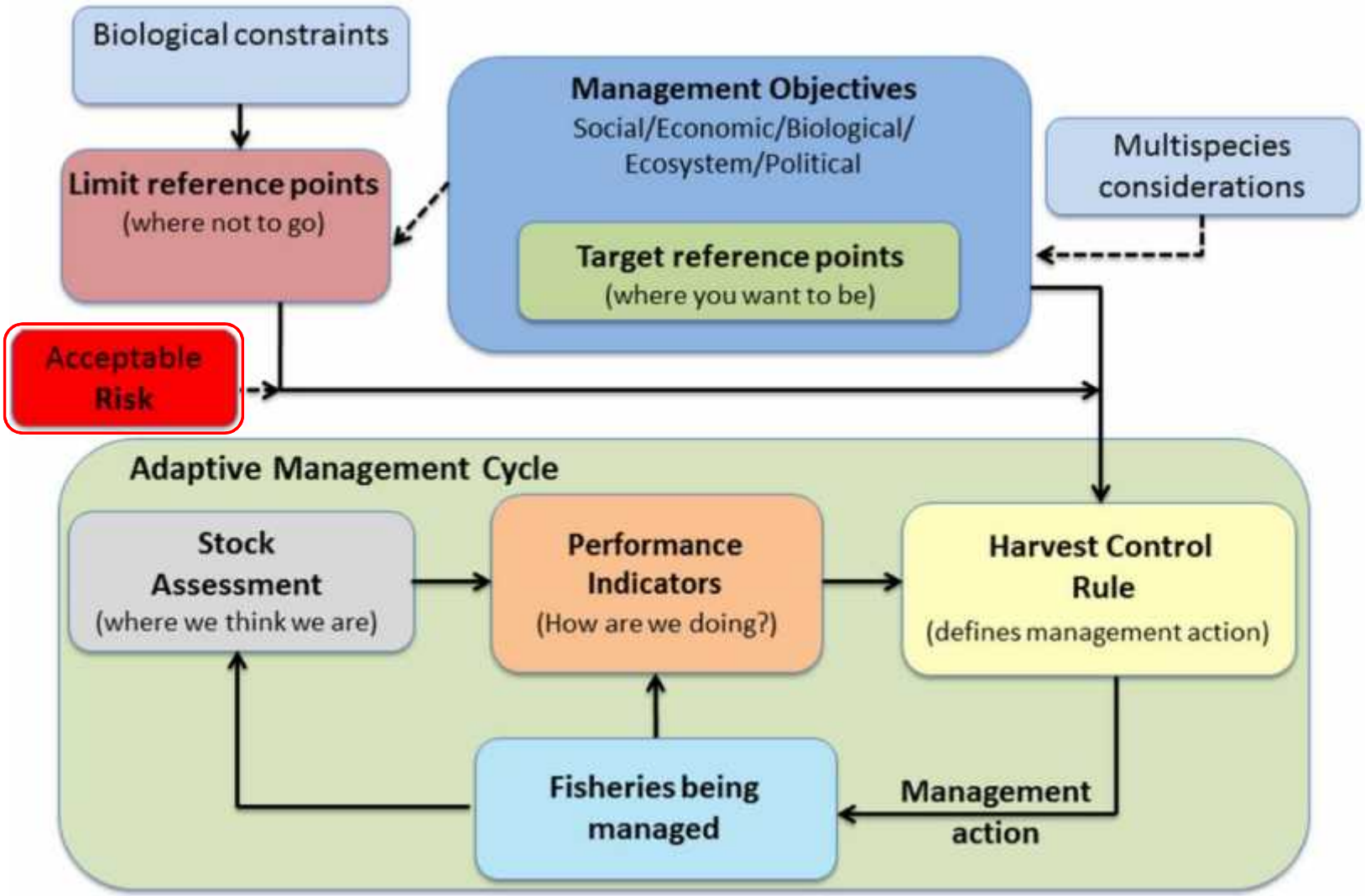
Outline of presentation

- What is risk?
- Why do we need to decide acceptable risk levels?
- Scientific Advice
  - Buffer between limits from potential targets
  - Risks of breaching limit at current stock status
- What are the consequences of breaching limits?
- What is “very low”?
- Relationship of risk and uncertainty

What is risk

Why do we need to decide acceptable risk levels

- An essential part of WCPFCs harvest strategy approach.
  "The Commission shall define acceptable levels of risk associated with breaching limit reference points..." (CMM 2014-06).
- This is consistent with Annex II of the UN Fish Stocks Agreement which states that "Fishery management strategies shall ensure that the risk of exceeding limit reference points is very low".


Biological constraints
Management Objectives
Social/Economic/Biological/
Ecosystem/Political
Multispecies considerations
Limit reference points
(where not to go)
Target reference points
(where you want to be)
Acceptable Risk
Adaptive Management Cycle
Stock Assessment
(where we think we are)
Performance Indicators
(How are we doing?)
Harvest Control Rule
(defines management action)
Fisheries being managed
Management action

Buffer between limits and potential targets (1)

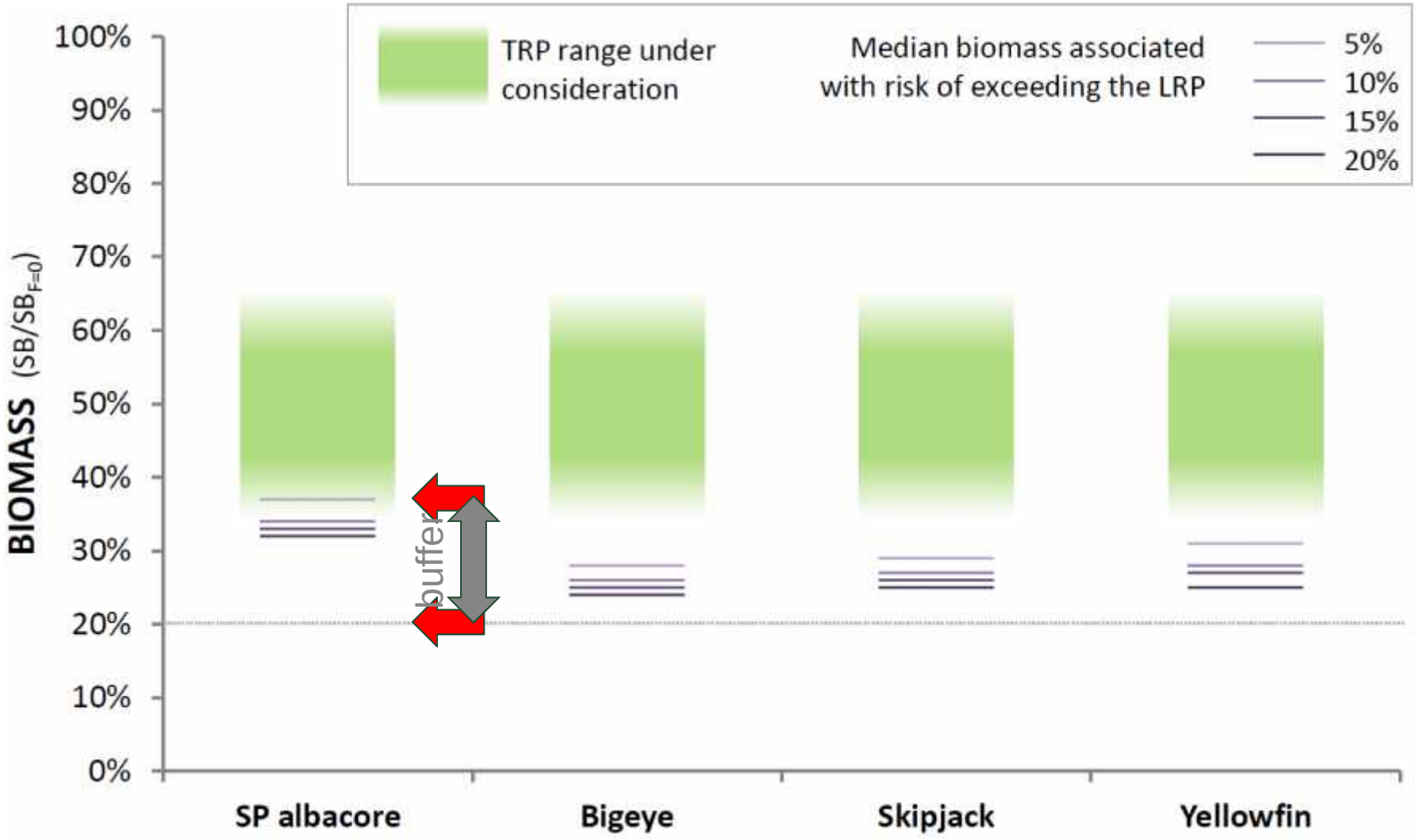
- *"Target reference points shall be conservative and separated from limit reference points with an appropriate buffer, with a view to ensuring that the target reference points are not so close to the limit reference points that the chance that the limits are exceeded is greater than the agreed level of risk."* (CMM 2014-06)

Table 1. Median levels of spawning biomass depletion (SB/SBF=0) associated with a given risk of exceeding the limit reference point of 0.2SBF=0 for the four main tuna stocks. (Source: MOW3 WP-02, except for south Pacific albacore which were derived from HSW-WP-05)

Acceptable risk	SP albacore	Bigeye tuna	Skipjack tuna	Yellowfin tuna
5%	0.37	0.28	0.29	0.31
10%	0.34	0.26	0.27	0.28
15%	0.33	0.25	0.26	0.27
20%	0.32	0.24	0.25	0.25

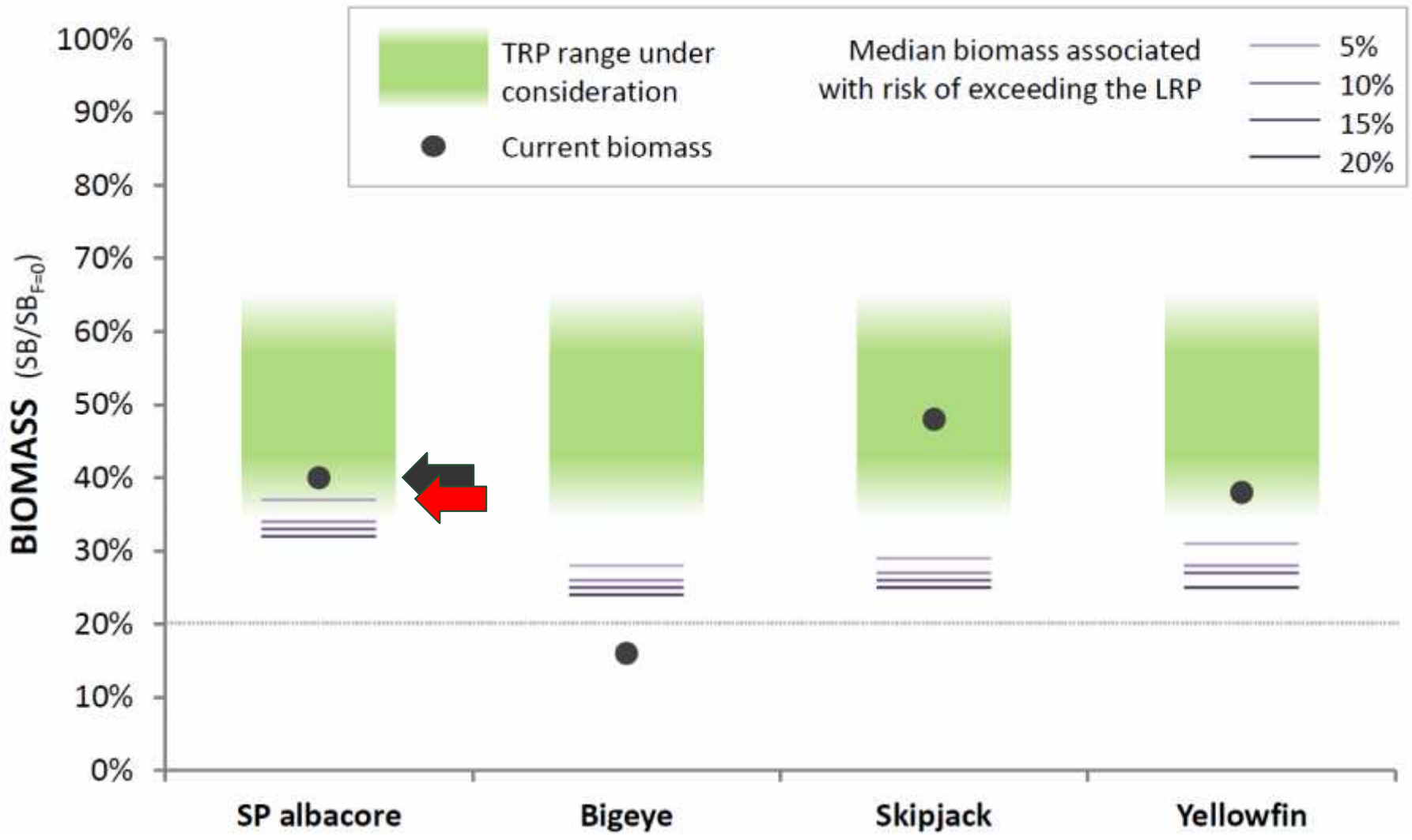
Buffer between limits and potential targets (2)

Sources: MOW3-WP-02, HSW-WP-05

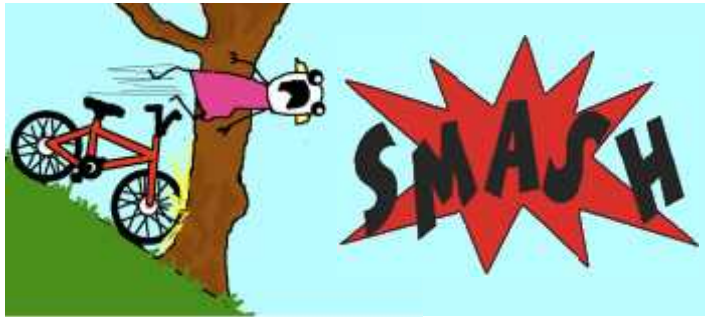


Current biomass and "minimum" TRP levels

Sources: MOW3-WP-02, HSW-WP-05



What are the consequences of breaching limits?



Some example consequences:

- **Biological:** Depletion below the LRP is where we might expect declines in recruitment and higher recruitment variability.
- **Economic:** Low biomass can result in reduced total yields, lower catch rates with reduced or no economic returns (E.g. south Pacific albacore).
- **Social:** Social and food security consequences, particularly for nations or communities with a substantial reliance on that stock.

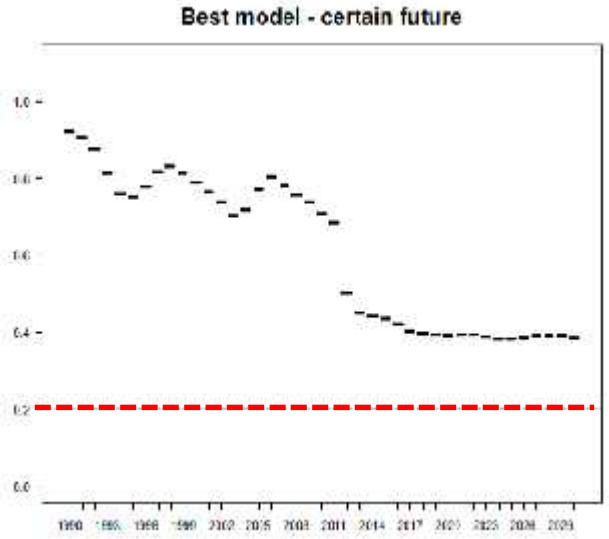
... plus other consequences.

What is “very low”?

- UN Fish Stocks Agreement and CMM 2014-06 require that the risk of exceeding limit reference points is “very low”.
- If the consequences are severe then you would want a very low probability.
- What have others adopted?
  - CCAMLR 10%
  - New Zealand 10%
  - Australia 10%
  - ICES/EU 5-20% (recommended but not adopted)

Relationship between risk and uncertainty

- How we perceive uncertainty will impact our consideration of risk



Relationship between risk and uncertainty

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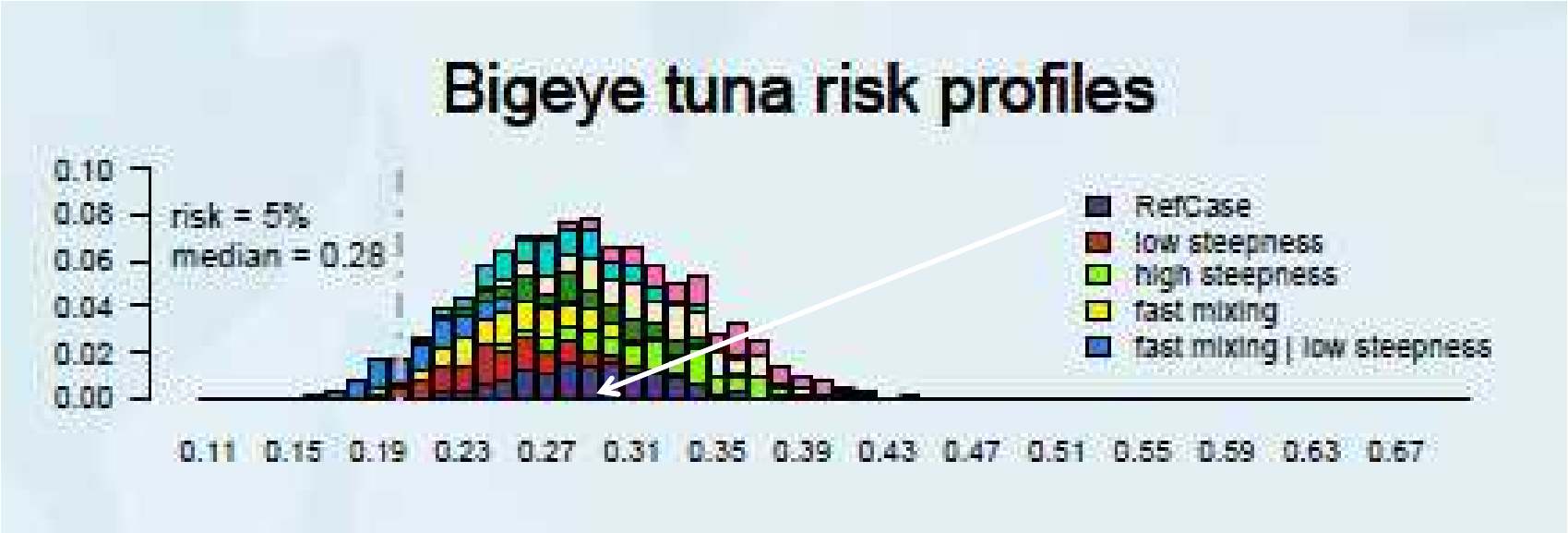

Summary Points

- Establishing acceptable levels of risk is important for guiding management decisions (UNFSA, CMM 2014-06).
- The lowest risk tolerance (5%) requires a larger buffer and implies minimum targets of greater than ~$B_{30\%}$ for SKJ, YFT and BET and greater than $B_{37\%}$ for ALB.
- However, these are below the targets under consideration. ✓
- There are biological, economic and social consequences of breaching the LRP. More severe consequences would suggest lower probabilities desirable.
- There is an inevitable link between estimated risk and how uncertainty is characterised.

Discussion Points

- The relationship between limits, required buffers, targets and uncertainty.
- What might be the consequence of breaching the LRP for the different stocks?
- Proposals for risk levels for key tuna species?

Terima kasih

(thankyou)

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Relationship between limits, required buffers, targets and uncertainty.