NORTHERN COMMITTEE
ELEVENTH REGULAR SESSION

31 August - 3 September 2015
Sapporo, Hokkaido, Japan

JAPAN'S BASIC VIEW IN CONSIDERING REFERENCE POINTS FOR PACIFIC BLUEFIN TUNA

WCPFC-NC11-2015/IP-09

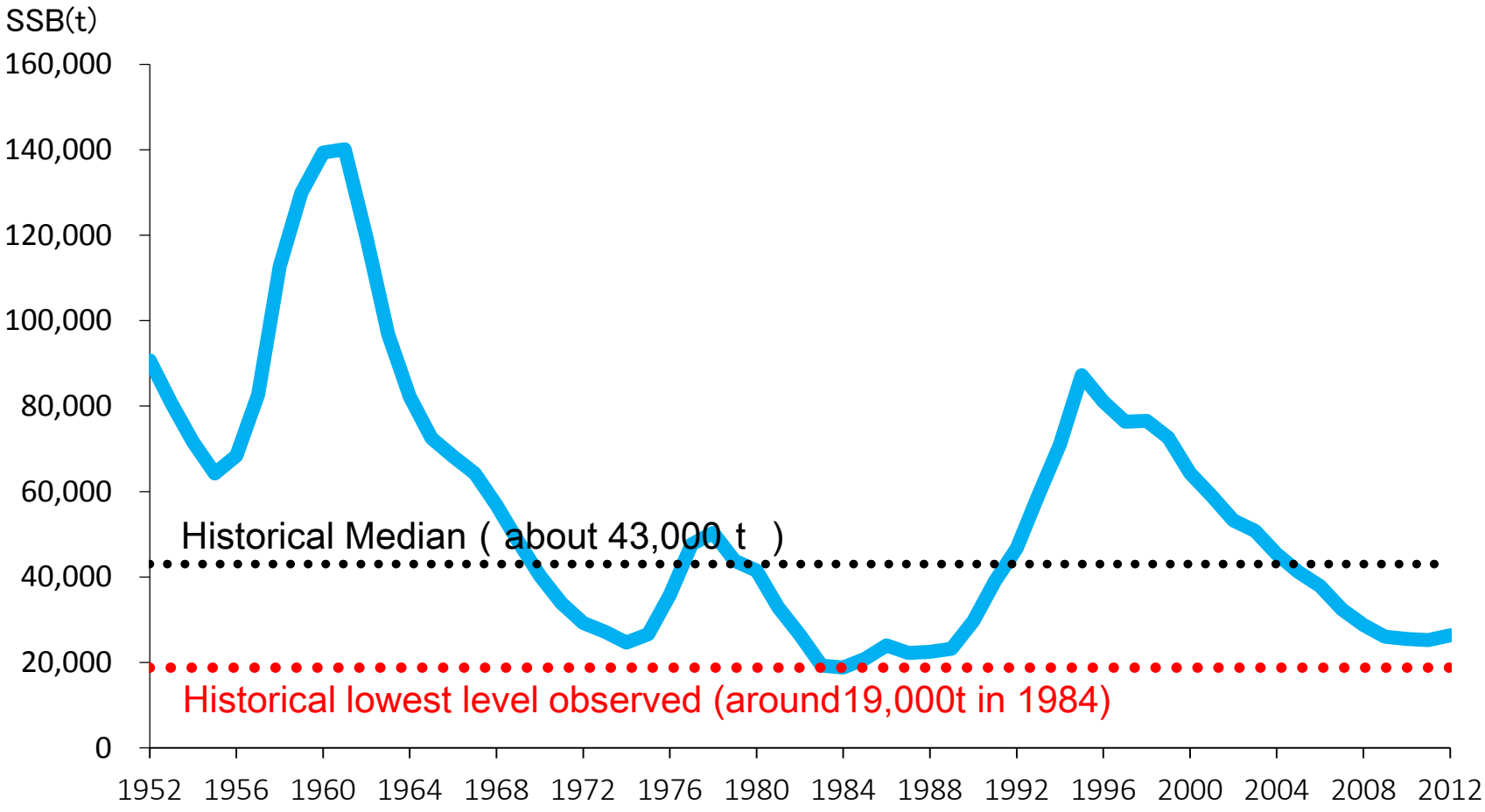
JAPAN

Japan’s basic view in considering reference points for PBF

What is PBF?

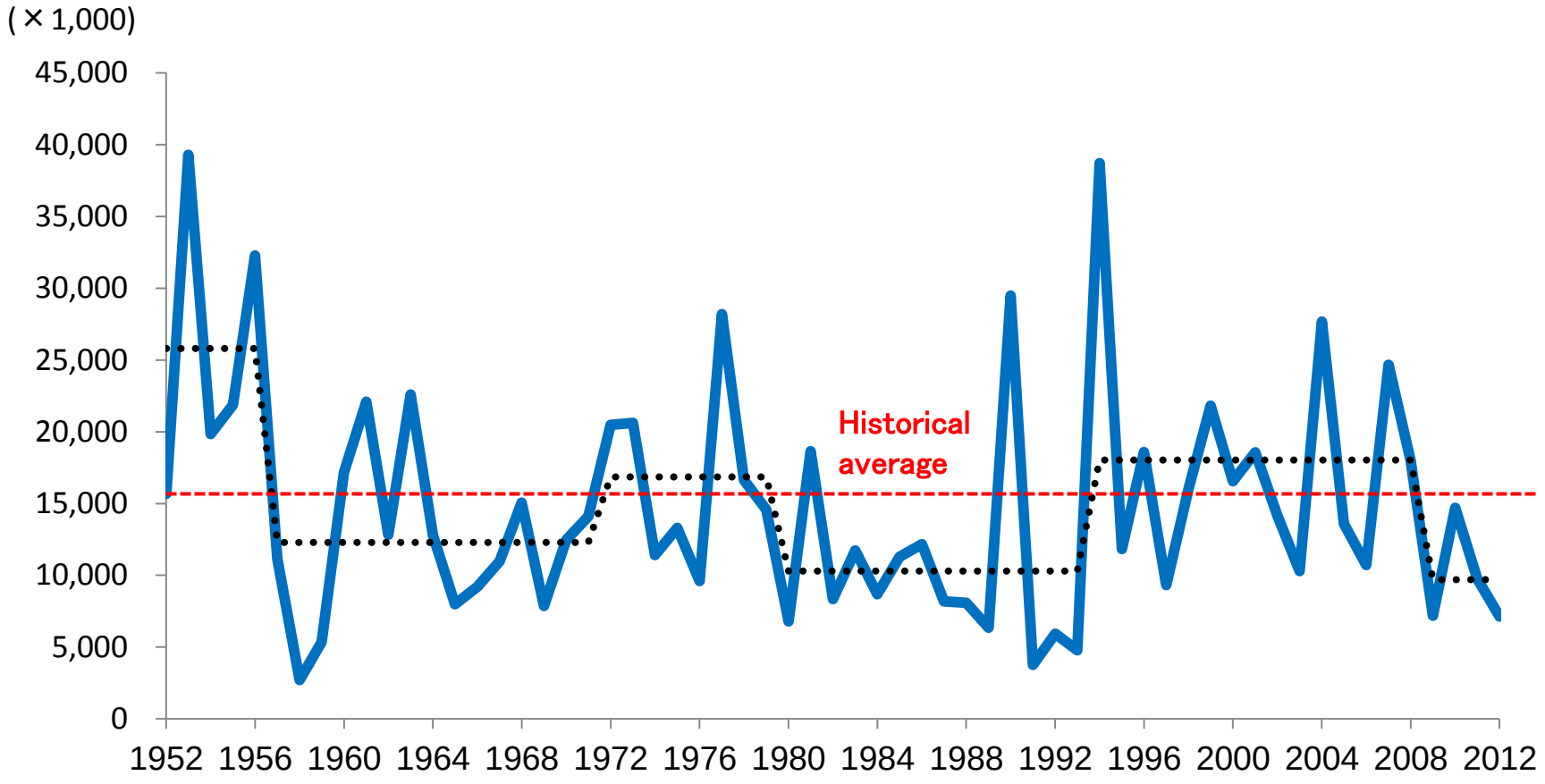
Spawning Stock Biomass of PBF

- The current (2012) SSB of 26,324t is near historically lowest levels (around 19,000t).
- Lower SSBs than current level were observed 11 times in last 60 years; in 1974, 1983-1989, 2009-2011. ---- Shouldn't be optimistic but within the range of experience.

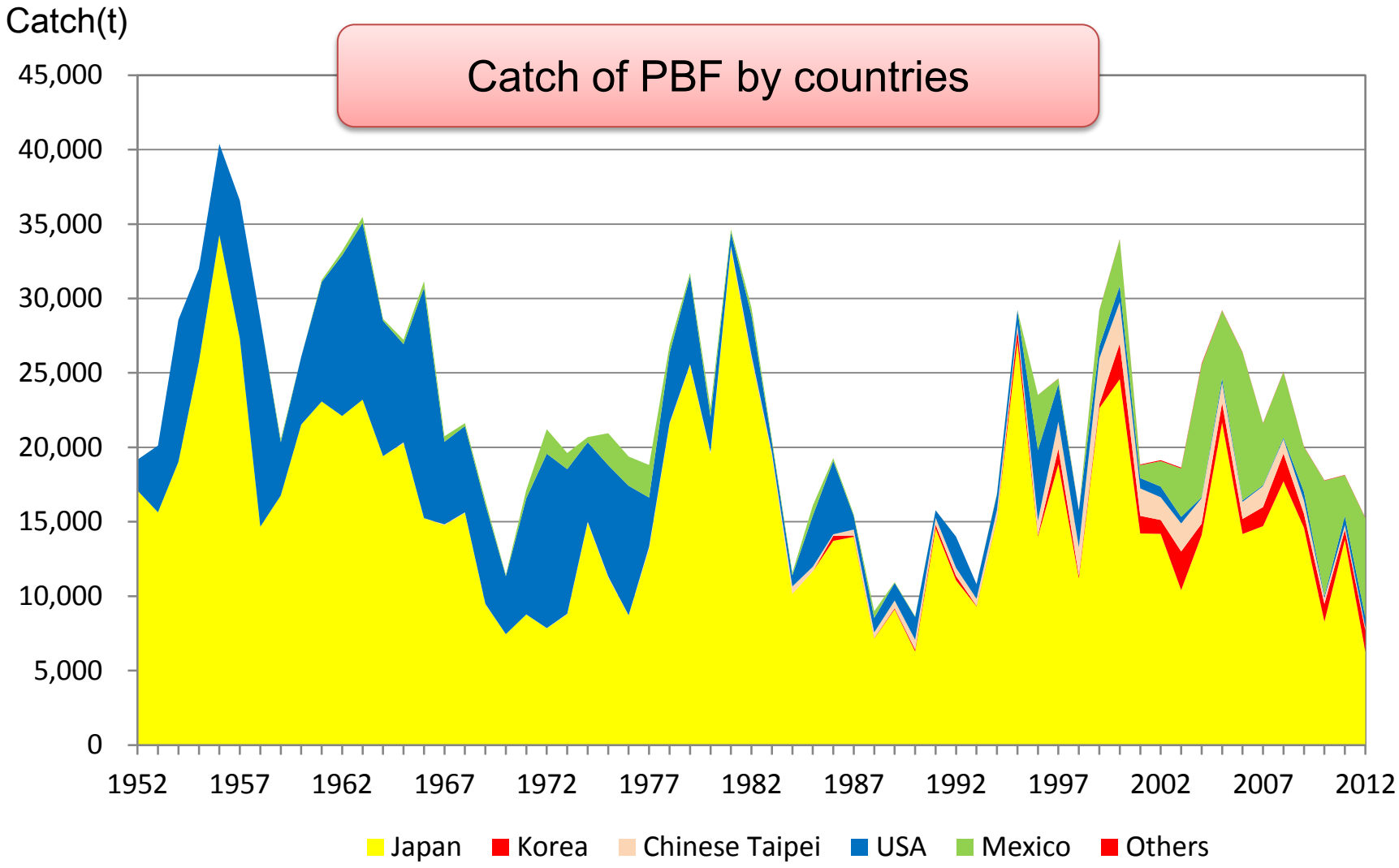


Recruitment of PBF

- Recruitment of PBF fluctuates relatively independent with the level of SSB.
- However, the recruitment level for the last 5 years may have been below the historical average level.



Fisheries Targeting PBF



Summary of “What is PBF?”

- Long history of harvest. Substantial catch in juvenile throughout history.
- Stock fluctuated substantially (20 – 140 thousand) , current SSB is within the range of fluctuation.
- Weak spawner - recruitment relationship. Relatively robust recruitment with low SSB
- Complex fisheries, particularly in Japan. Comprehensive measures started from 2014 and 50% reduction was applied to all the fisheries from 2015.
- Large numbers of stake holders (U.S.A., Mexico, Korea, Chinese Taipei and Japan)
- Japan: Purse seine vessels + 24,000 small scale boats + 1,800 set net

How should PBF be managed?

Reference points in WCPFC Convention Text and CMMs

- **Article 5 (b)**

  … ensure that such measures are designed to maintain or restore stocks at levels capable of producing **maximum sustainable yield (MSY)** …

- **Article 6, 1 (a)**

  1. In applying the precautionary approach, the members of the Commission shall:
  (a) Apply the guidelines set out in Annex II of the Agreement, …, and determine, …, **stock specific reference** points and the action to be taken if they are exceeded;

- **Paragraph 4, Annex I, CMM2014-06** (Stock-specific reference points)

  i. Targets intended to **meet management objectives** (TRP)
  ii. Limits intended to constrain harvesting **within safe biological limits** (LRP)

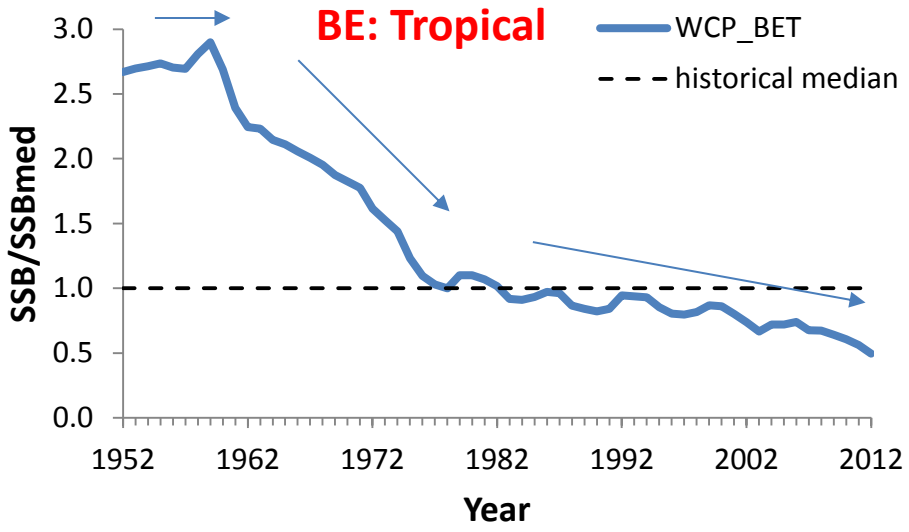
- **Paragraph 2, CMM2016-04 (PBF HCR)**

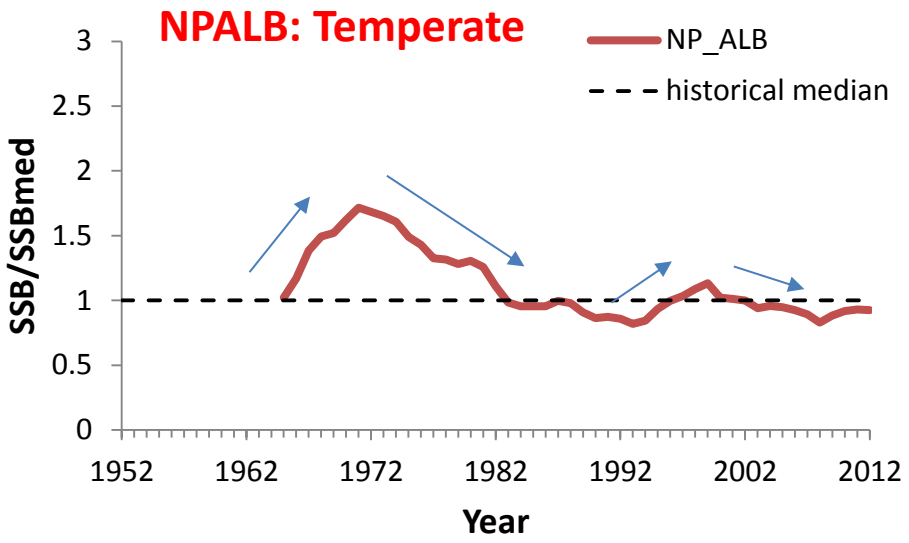
  NC shall **consider and develop RP and HCR** for the long-term management of PBF at its meetings **in 2015 and 2016**.

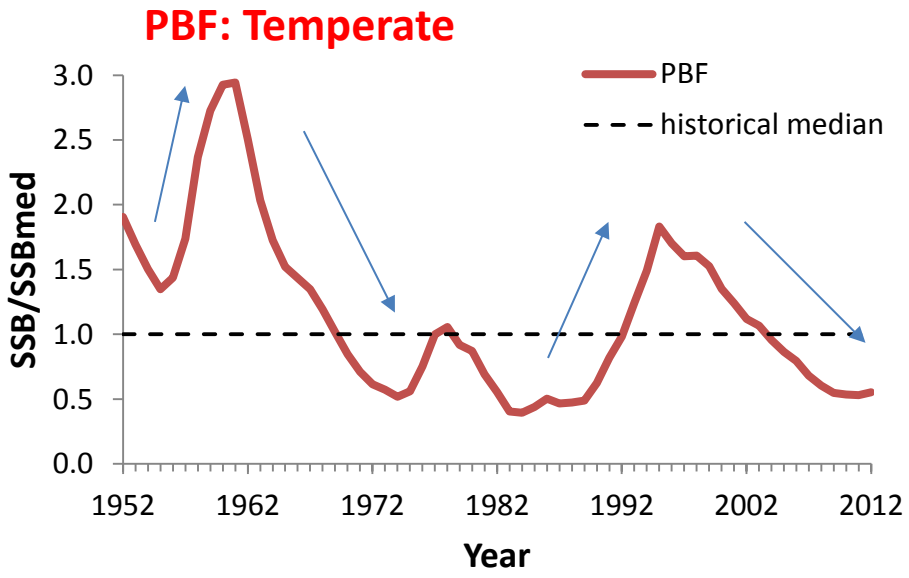
Can PBF be managed using standard reference points?

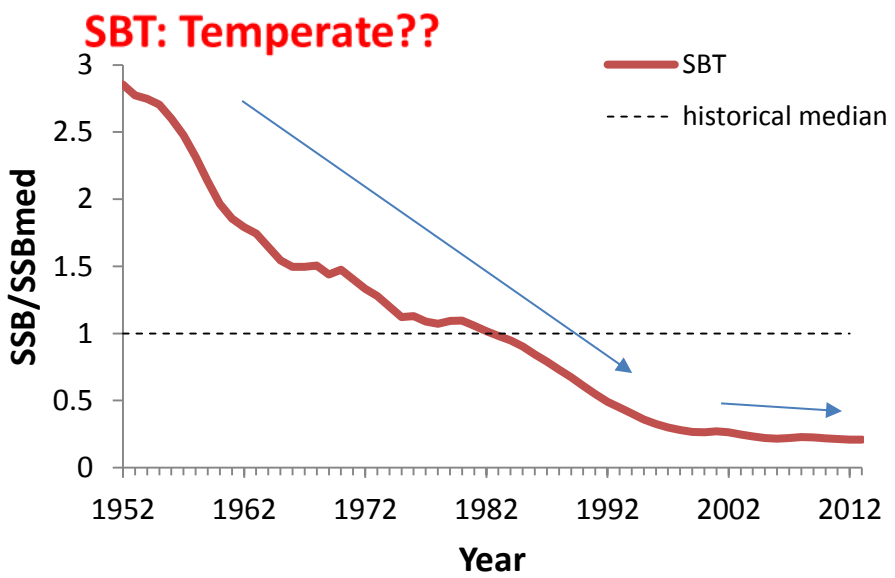
- Due to uncertainty of assumptions such as stock-recruitment relationship, there is no major stocks for which MSY was scientifically established.
- In stead, 20%$SSB_{current\ F=0}$ was accepted as a proxy for B_{MSY} for BE, YF, SKJ, NPALB & SPALB.
- Characteristics of PBF are:
  - Quite long history of exploitation;
  - Large fluctuation of recruitment
- Can X% of $SSB_{current\ F=0}$ be reliable basis for long-term management objective for PBF management?
- Need careful approach taking into account of PBF nature and fisheries

Can PBF be managed using standard reference points (2) ?: SSB Trend of 4 Major Tunas

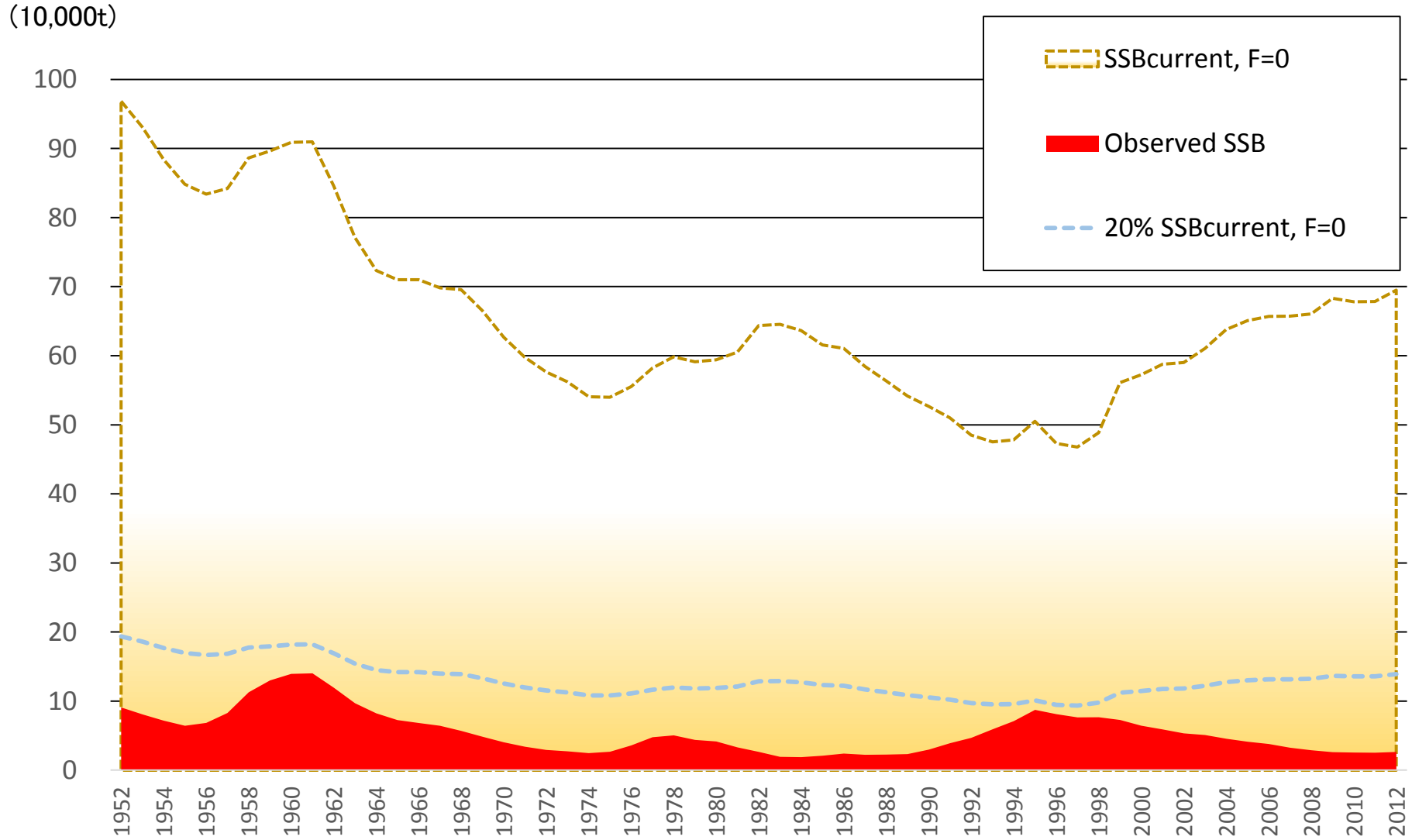








PBF: Relationship between Estimated SSB ($SSB_{current, F=0}$) and Observed SSB

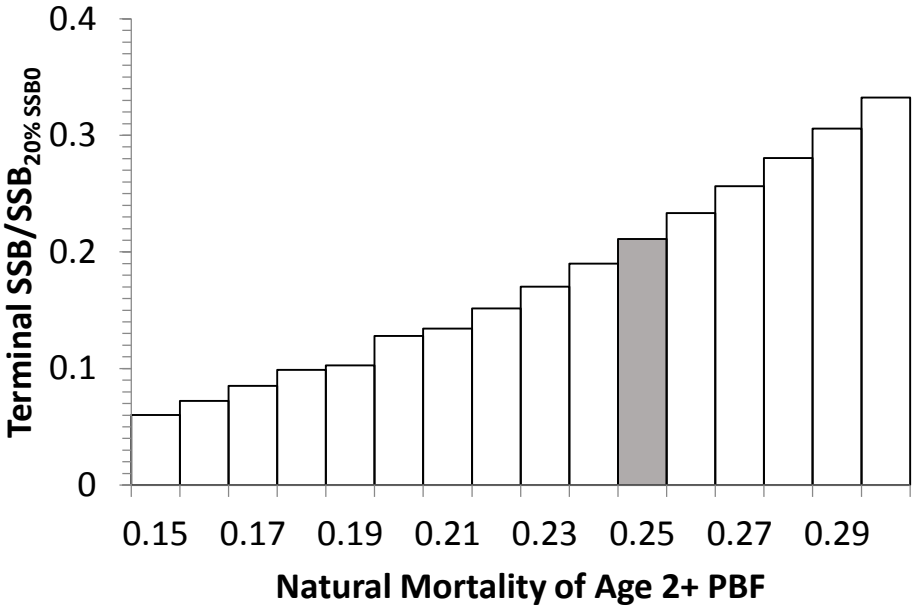


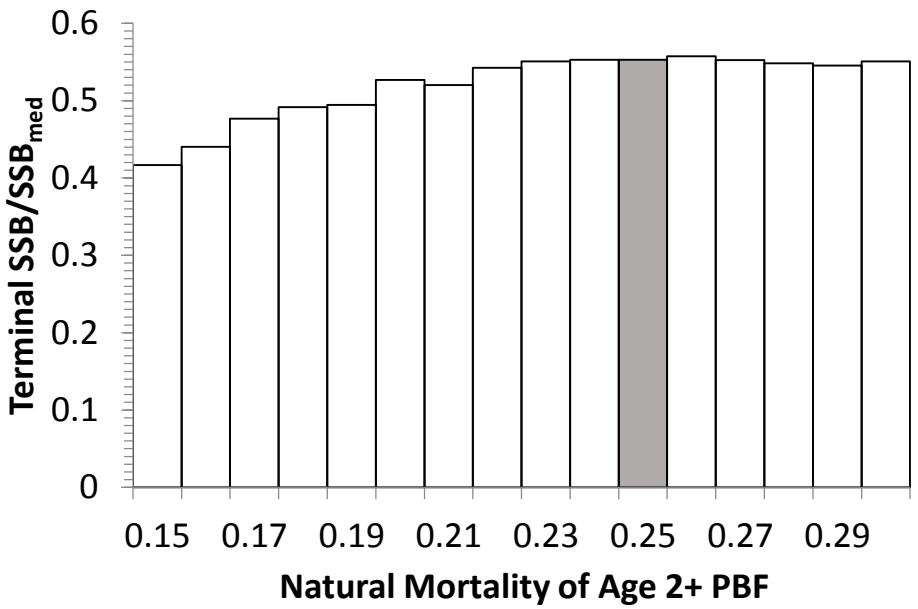
Can PBF be managed using standard reference points (3)?

- Estimated $SSB_{current,\ F=0}$ (SSB0) has fluctuated from 470,000t to 970,000t in last 60 years, and will fluctuate.
- Therefore, 20% SSB0 has fluctuated from 94,000t to 194,000t.
- 20% SSB0 has never been achieved in PBF SSB in last 60 years.
- Yet, PBF population has been sustained in the same period of years.
- Current SSB is 20% of the highest SSB observed in 1960s.

Uncertainty of the RPs associated with the assessment model assumptions

- Reference points based on $SSB_{current, F=0}$ is highly sensitive to parameters used in the model such as natural mortarity.
- Biological assumptions such as Mortalities and Stock Recruitment Relationship are still uncertain.
- Setting specific SSB based on relative biomass (SSB_{med} or SSB in top quartile) is more robust approach than x% of $SSB_{current, F=0}$.





IATTC raised same point

- Developing management reference points for PBF is problematic, due to sensitivity to the stock assessment model's assumptions.

- In particular, absolute levels of biomass and fishing mortality, and **reference points based on MSY are hyper sensitive to the value of M**.

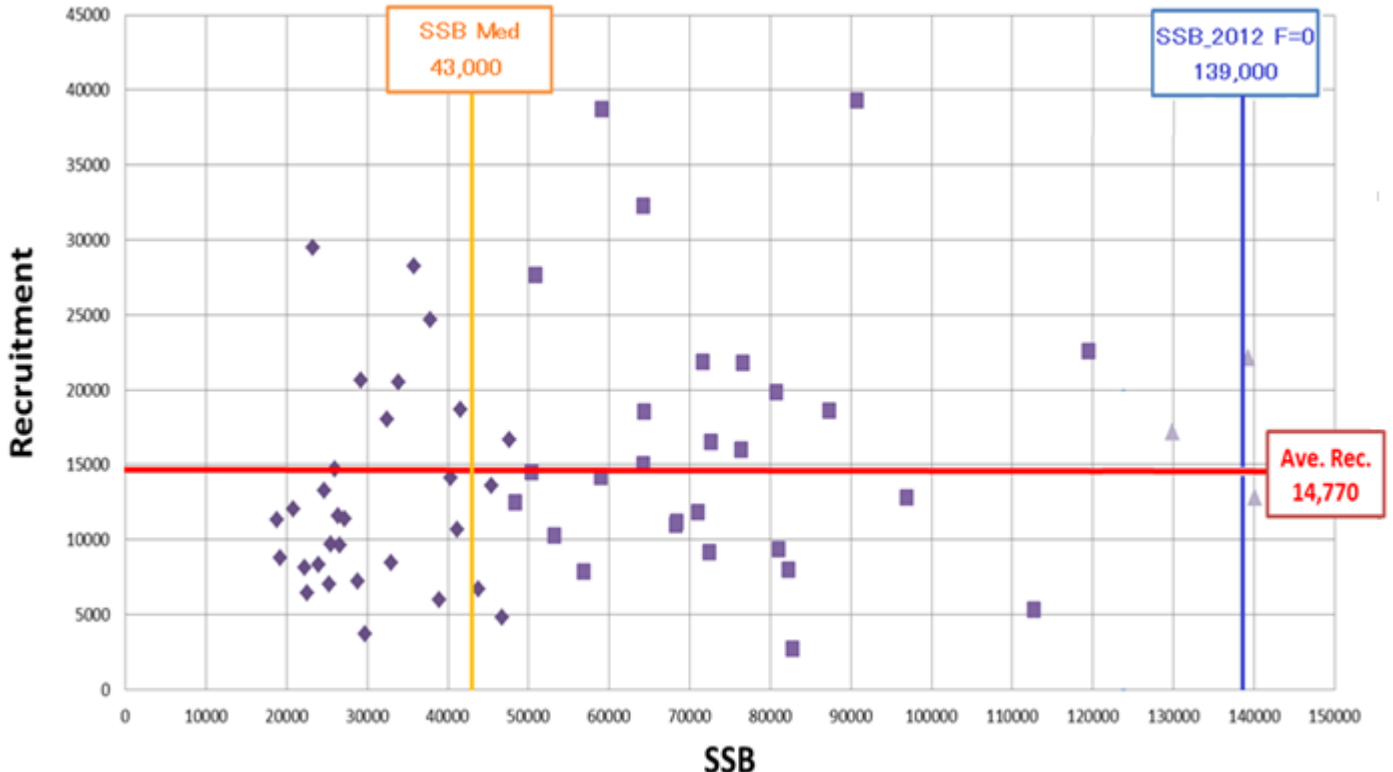
- **Relative trends** in biomass and fishing mortality levels are **more robust** to model assumptions.

- Therefore, **management reference points based on relative biomass or fishing mortality should be considered for managing PBF**.

P81, Document IATTC-89-04a

What is realistic management framework, then?

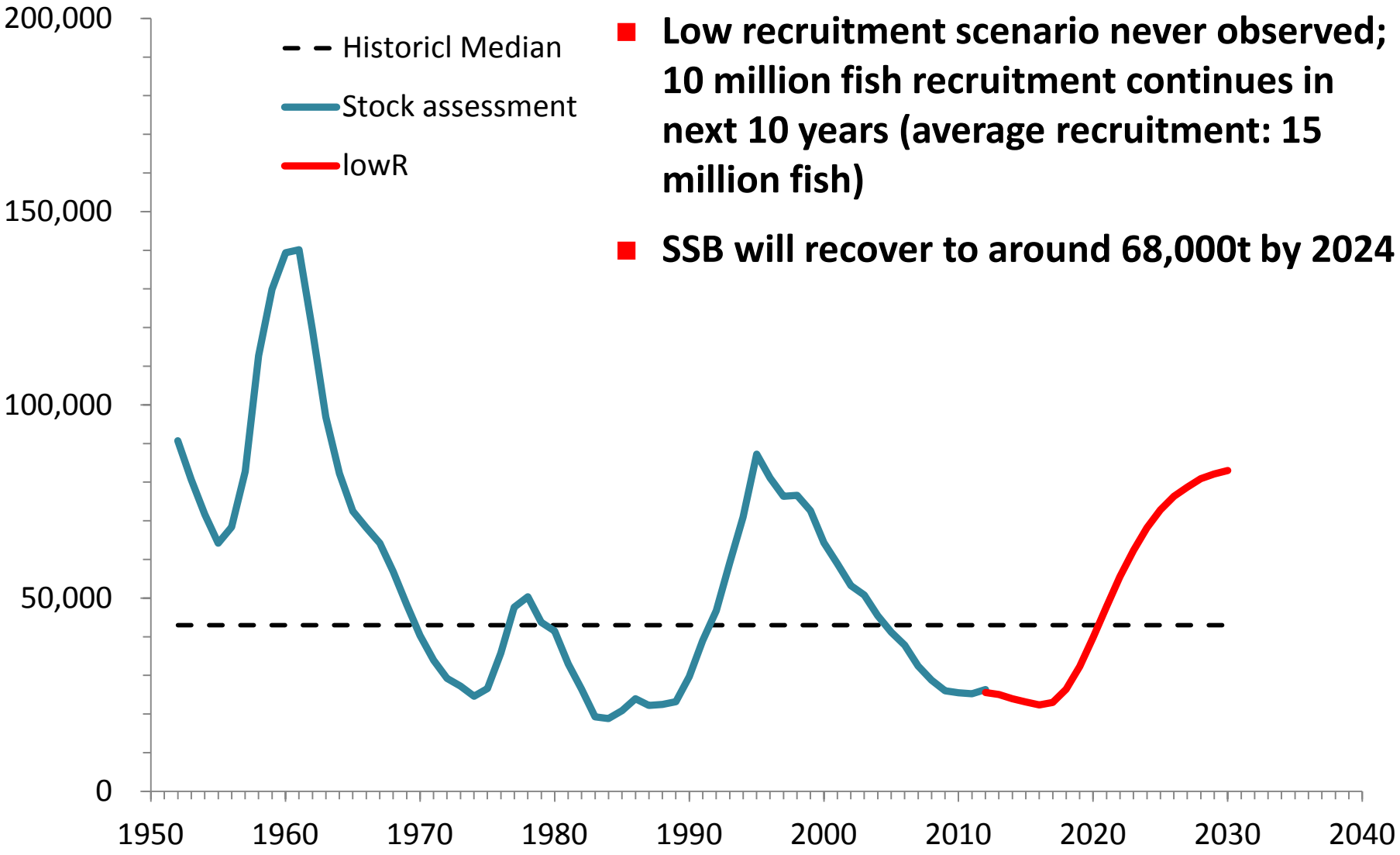
- Concept of LRP is a threshold where you don't want to be (to avoid recruitment collapse).
- In case of PBF, recruitment is considered to be robust if SSB is above historical median



How to develop the long term management of PBF?

- Set reference points empirically while raising SSB gradually to find SSB_{MSY}.
- Simultaneously develop rule to cope with possible recruitment collapse (emergency rule).

Lastly, is current measure not ambitious enough?



- **Low recruitment scenario never observed; 10 million fish recruitment continues in next 10 years (average recruitment: 15 million fish)**
- **SSB will recover to around 68,000t by 2024**