

Bluefin tuna stock sustainability in regional  
level

and in the Mediterranean Sea-

Comparative view between the Atlantic and Pacific

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2. Differences
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3. Challenges for sustainable fishery

# Similarity -Biology

- \* Start spawning at 3-year old
- \* Trans-oceanic migration
- \* Large stock size fluctuation induced by environmental changes

# Similarity - Fisheries

## \*Diversity

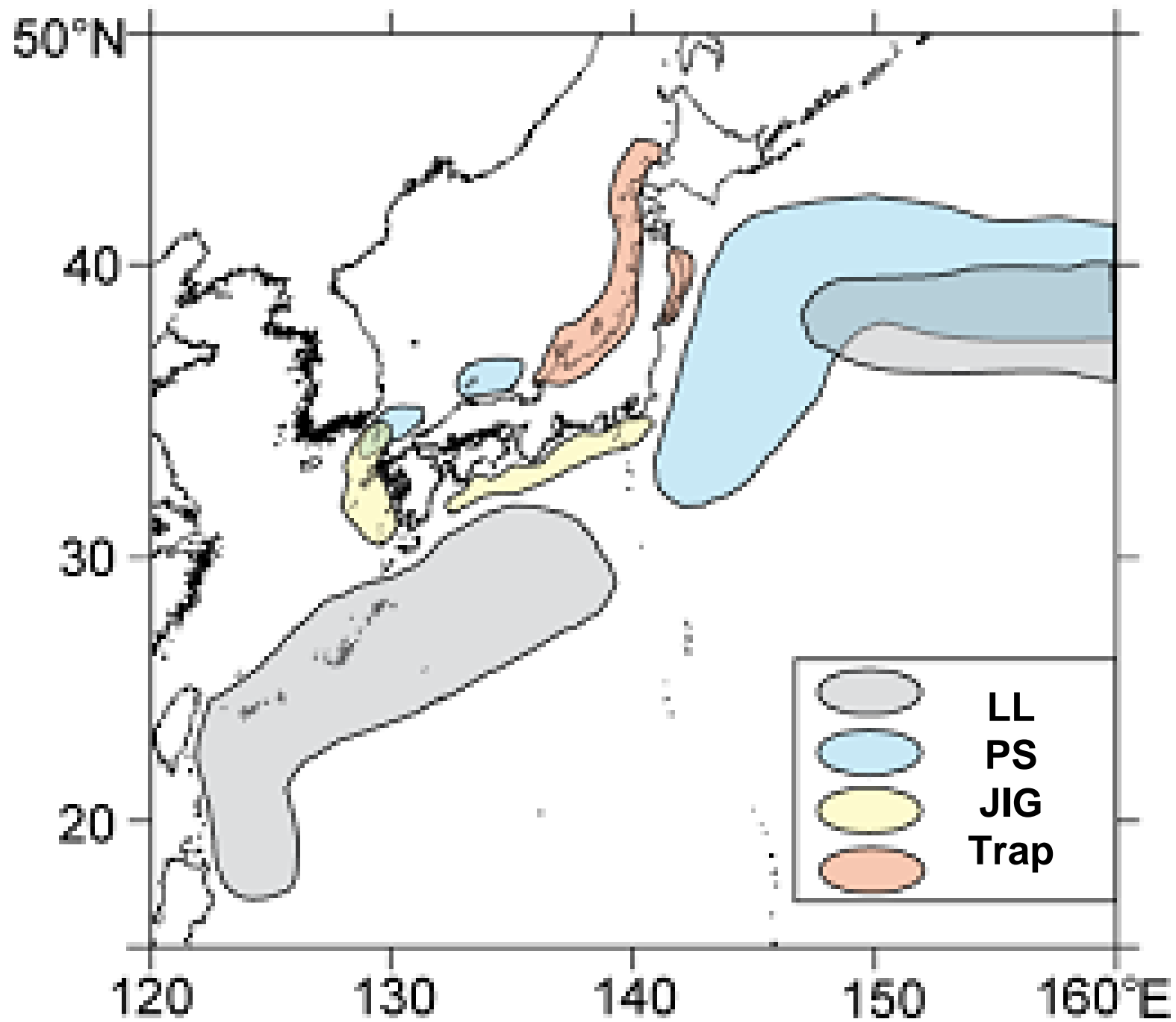
In fishing gears used

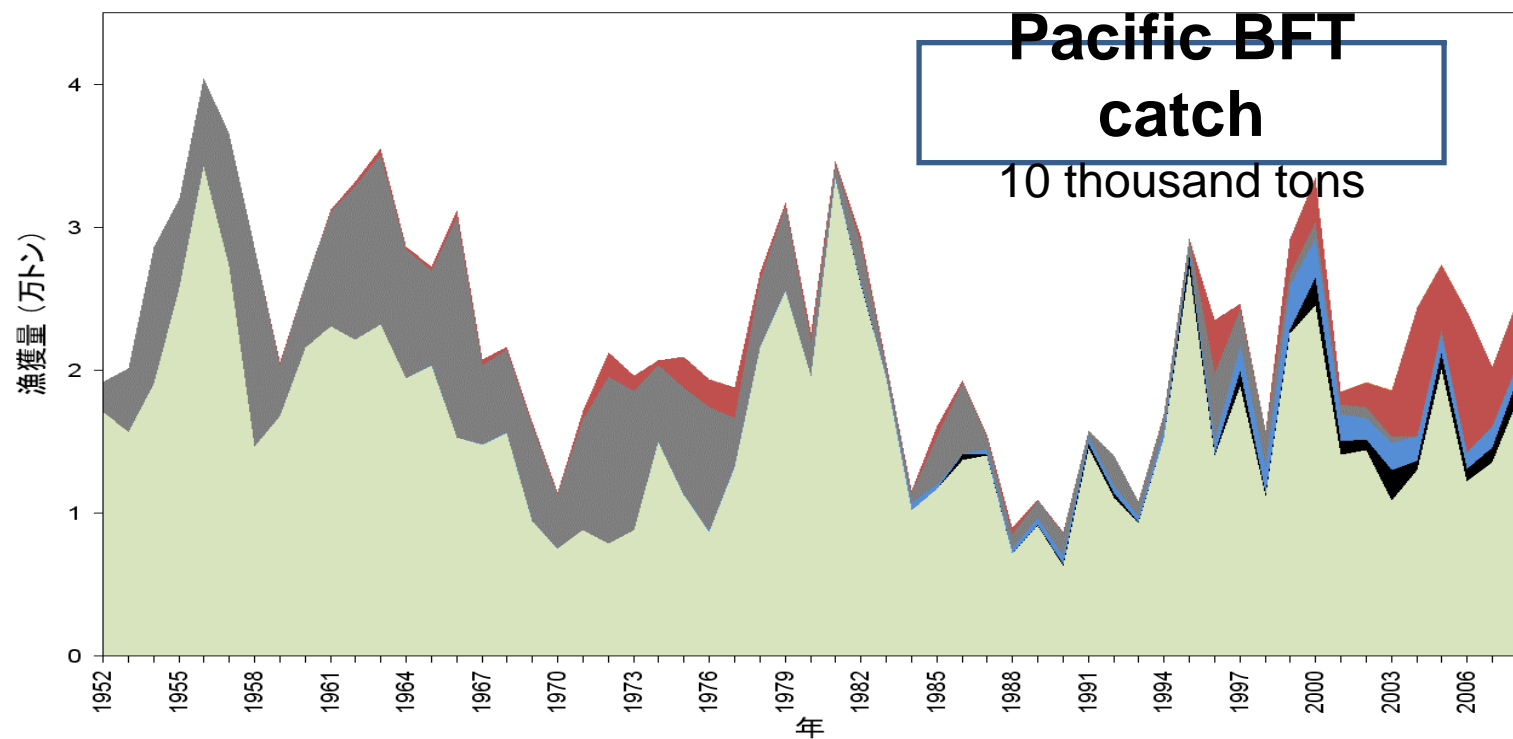
In boat sizes

In fish size caught

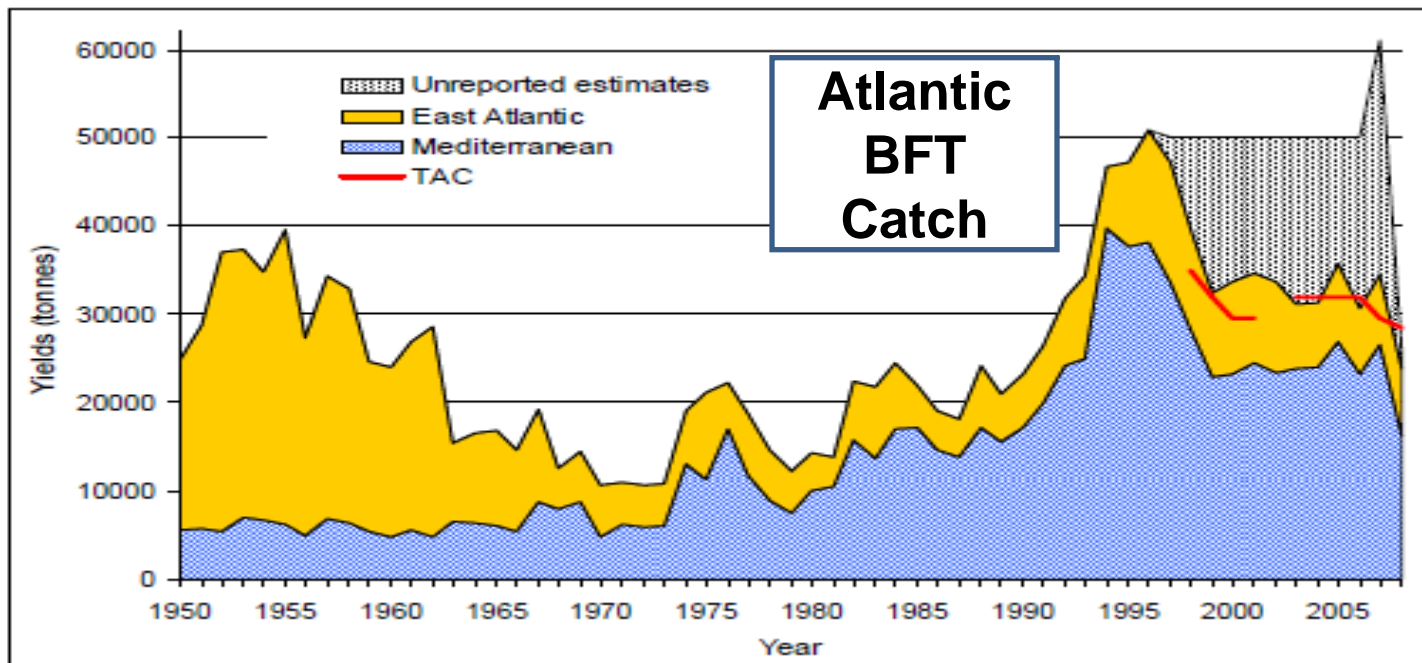
In target species/multiple species

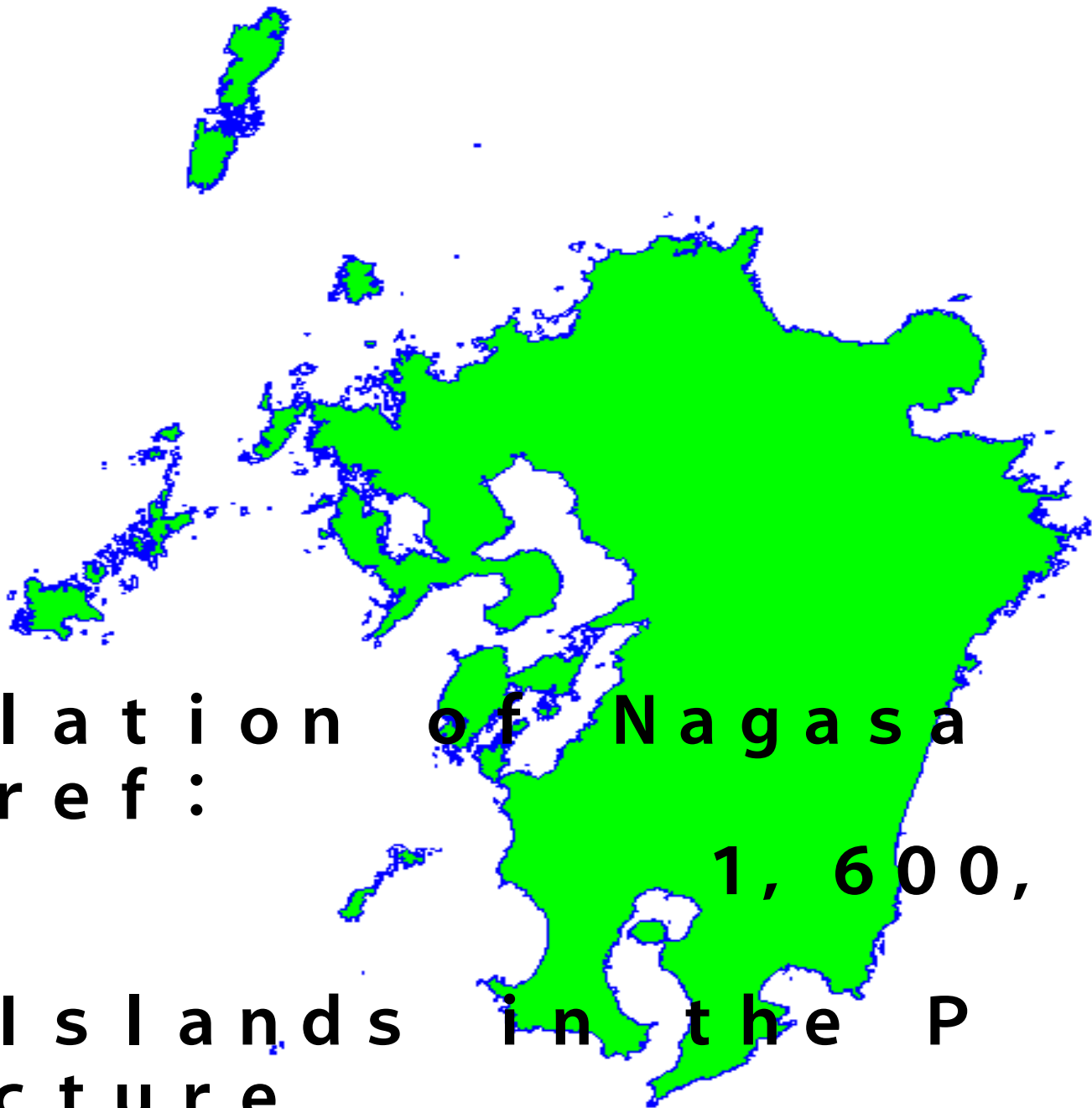
In income





**Mexico**  
**Taiwan**  
**Korea**  
**Japan**





Population of Nagasaki Pref:

1,600,000

600 Islands in the Prefecture

## **Small Scale Vessels: Troll or Jigging and others**

- Thousand Vessels (600 vessels only in Nagasaki Pref.)
- Mostly less than 5 tons
- No. of crew is 1 or 2 (aged fishermen)
- Catch: mostly house consumption, partly sell to market  
----- artisanal/subsistence fishery
- Difficulty in getting accurate catch data  
----- estimation from sales slips and interviews
- Difficulty in compliance and monitoring: small scale vessels in remote areas
- Effort of each vessel is small and stable
- No. of vessel is declining







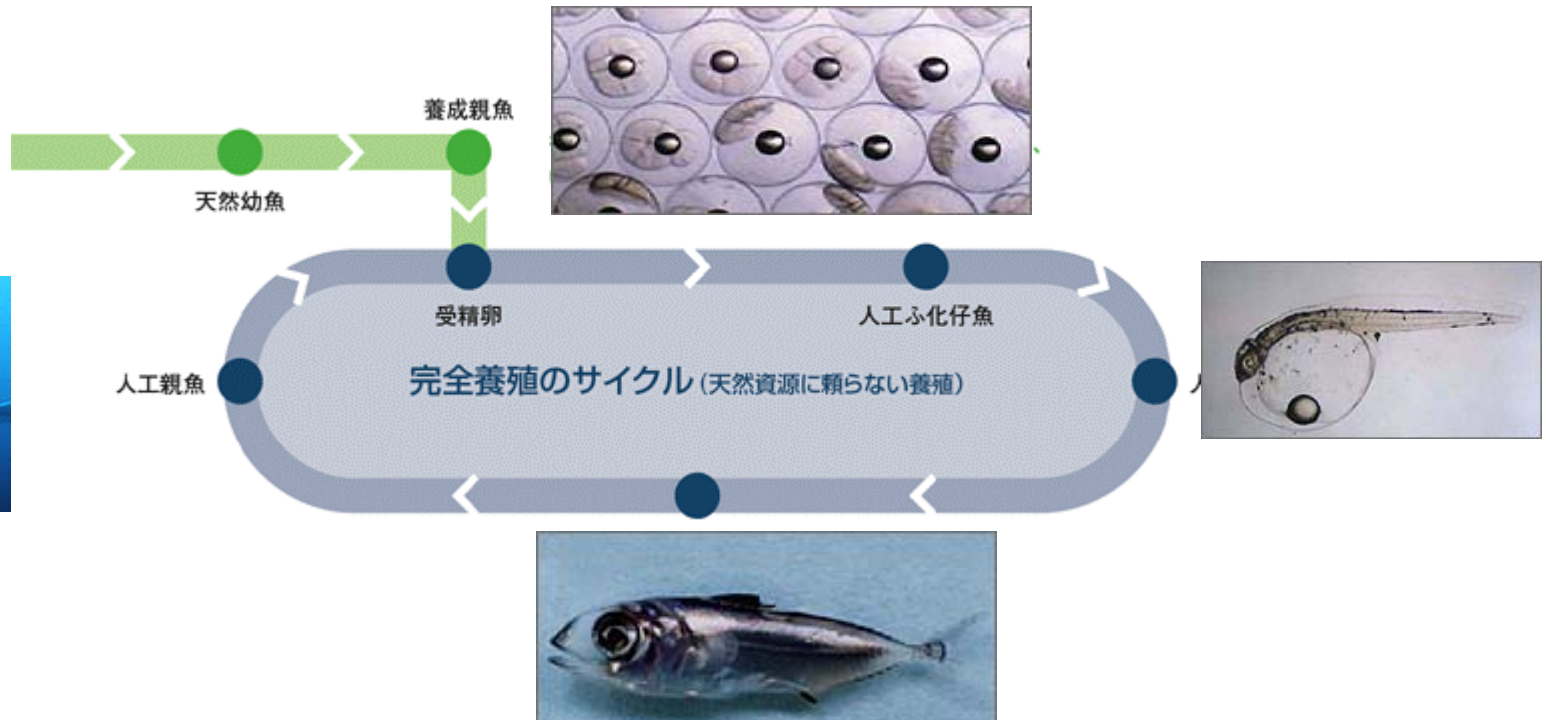
# Similarity -Farming

- \*Rapid increase/lack of basic data such as production and size of fish
- \*Economic competition between wild and farmed fish
- \*Conflict over farming site

# Complete aquaculture

Cited and modified from Kinki University web site  
<http://www.flku.jp/aquaculture/tuna/index.html#pageto>

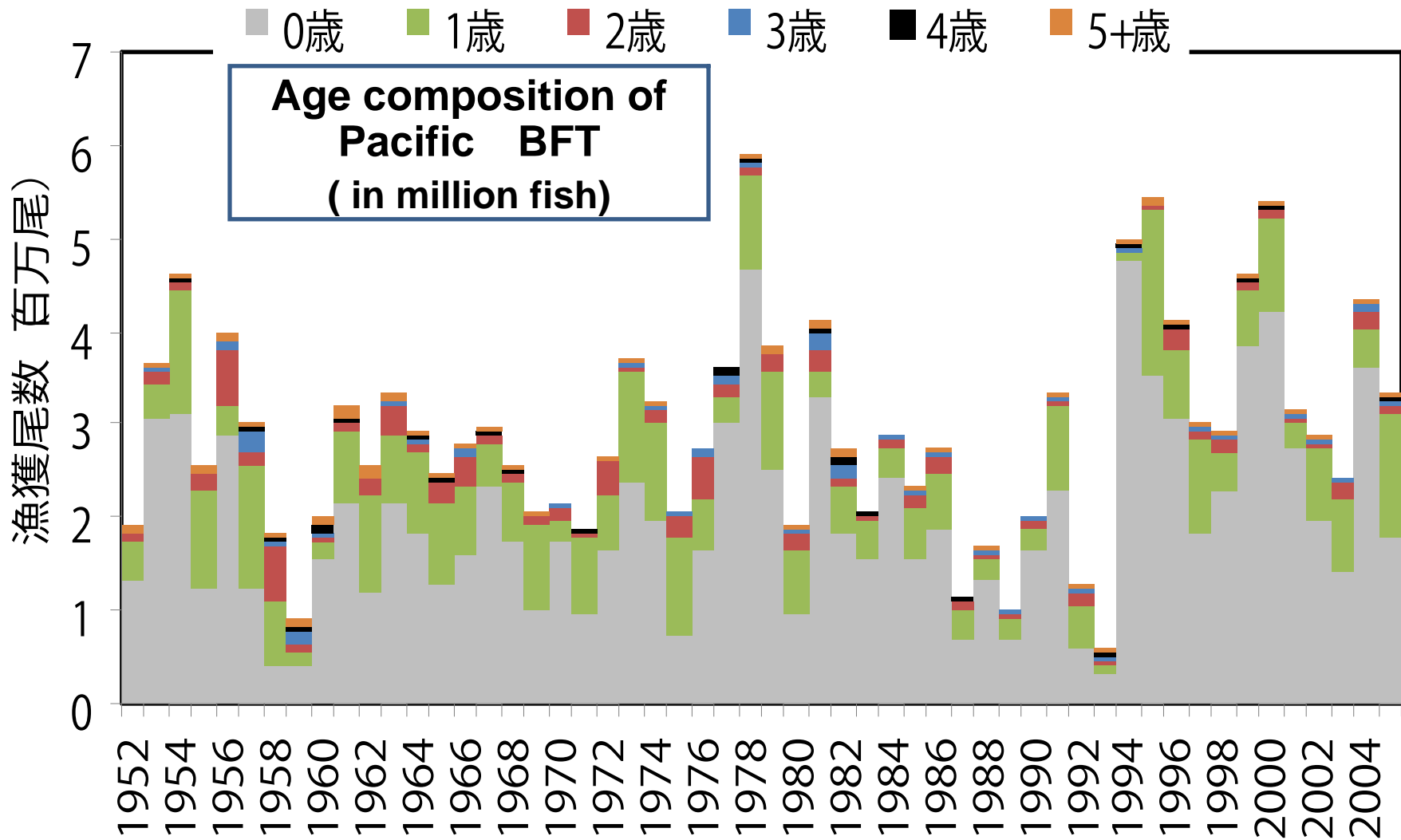
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Kinki Univ. produced and sold 32 thousands juvenile bluefin (30 cm, 3-month old, survival rate up to this size around 1%) to the farming market as seed fish in 2009

# Similarity –Management issues

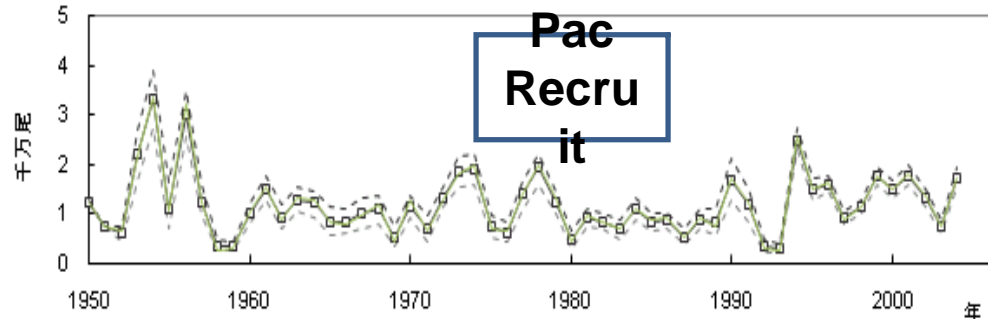
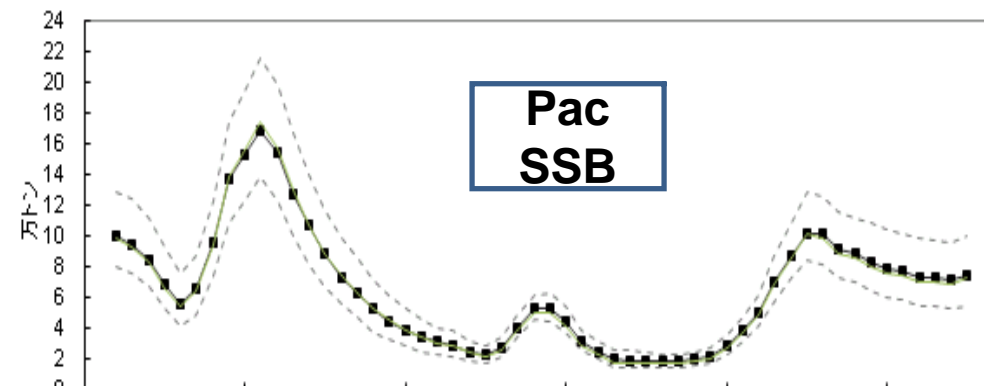
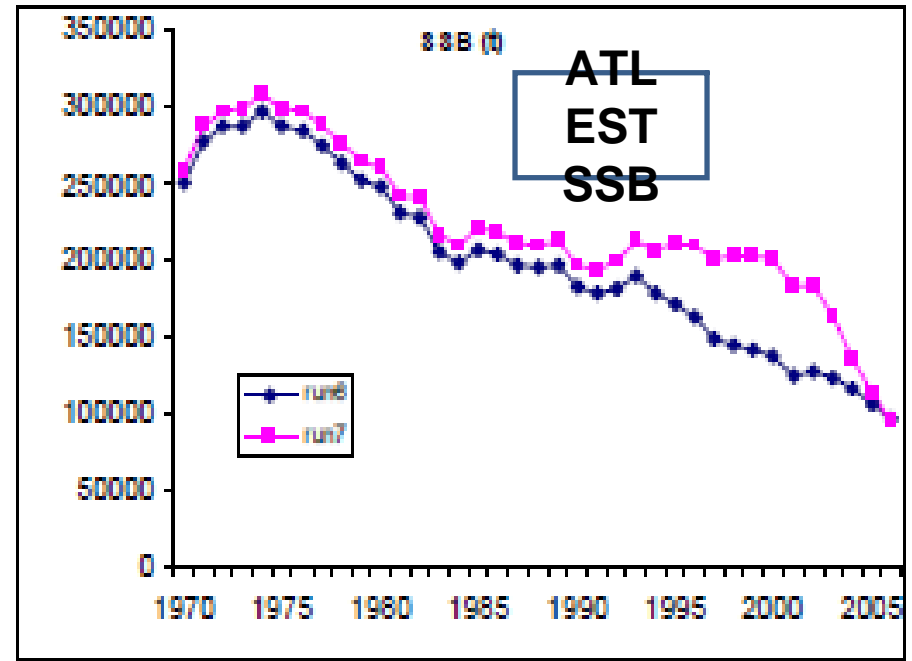
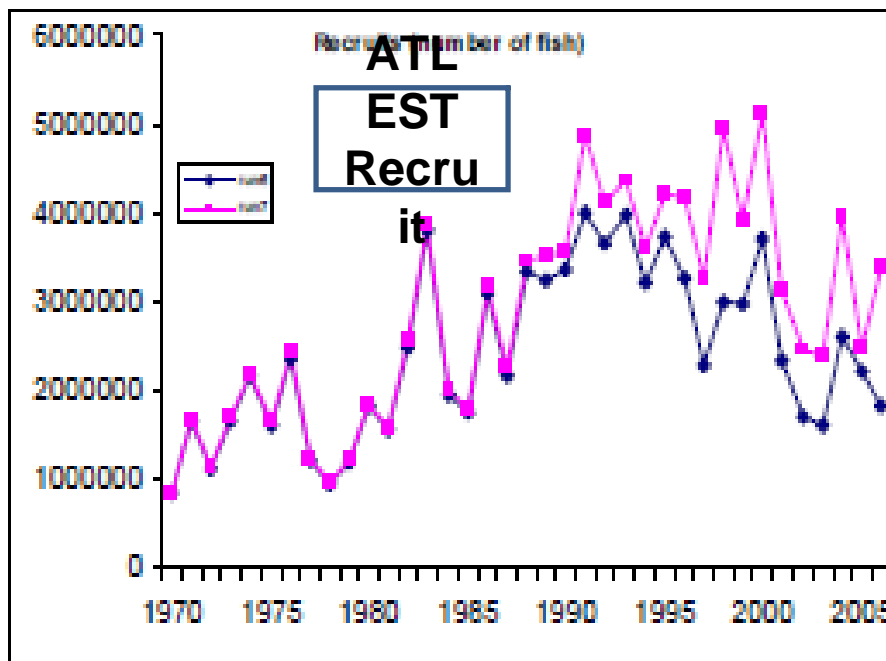
- Conflicts between fisheries
  - Capturing a large No. of juveniles
  - Small fish fishery vs large fish fishery
  - Mobility vs non-mobility
  - Target vs multiple fishery



**No increase of overall F for the stock and reduction of fishing mortality (F) for juvenile 0-2 ages are recommended**

## Differences – Stock status

- \* One stock in the Pacific, two stocks in the Atlantic
- \* Moderate changes in SSB in the Med.  
and large change in the Pacific
- \* Overfished vs non-overfished,  
depending on Biological Reference  
Points



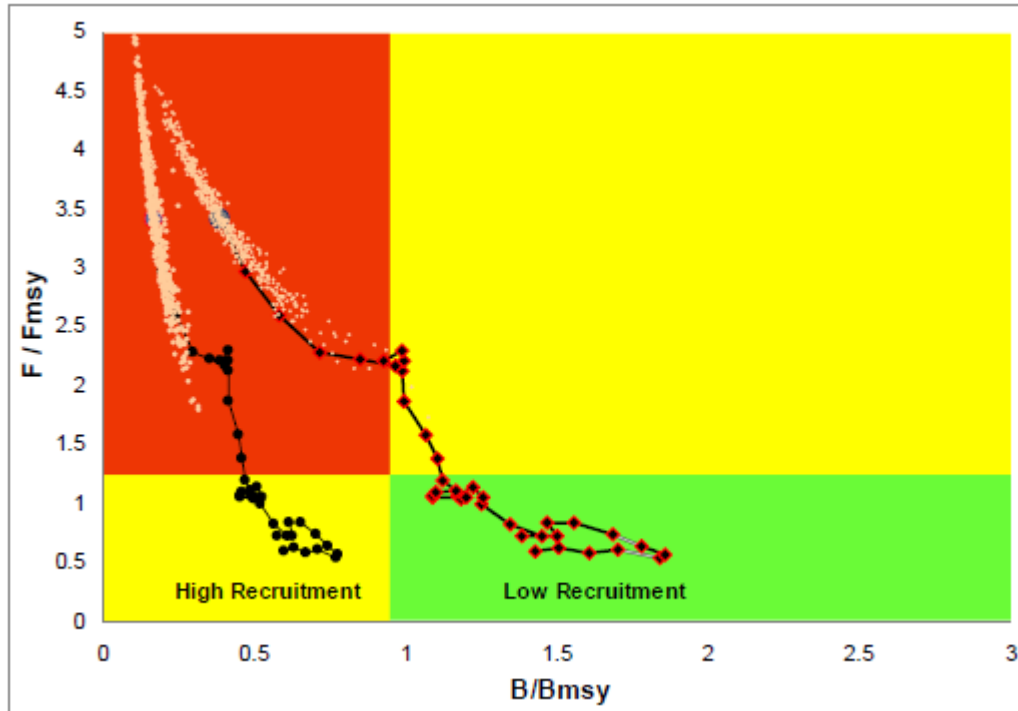


## Differences – Biological Reference Points

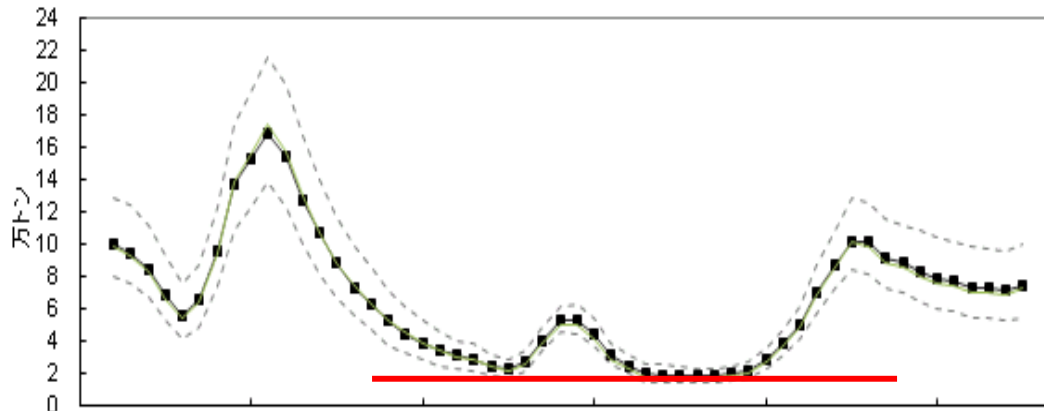
\*MSY/Equilibrium based in the Med

\*Minimum observed SSB based in  
the  
Pacific

**KOBE Chart  
ATL EST**



**PAC SSB  
and  
minimum  
(red bar)**



# Challenge for sustainable fishery

- Urgent need to collect minimum level of basic data, such as catch by size by area and time
- Set limit biological reference points, realistic one
- Harmonization of interests among the fisheries and among stake holders
- Establishment of MSC including aquaculture

Thank you very much for your  
attention