Reviews of albacore biology and fisheries around the transition areas in the north Pacific Ocean

Yoshinori Aoki, Ko Fujioka and Hidetada Kiyofuji
Growth and Maturity of albacore tuna

Reproductive biology
Mature at FL 85 cm
(Ashida et al. 2016)

Growth from otolith analysis
Chen et al. 2012
Albacore migration in the north Pacific Ocean

Immature Adults (Age > 6 yrs)

Spawning areas

Net sampling (Larvae) (Nishikawa et al. 1985)

Fisheries and tagging data (Immature to adults) (Kimura et al. 2004) (Childers et al. 2011)

Nikolic et al. 2017
Transition area in the north Pacific Ocean

Objective
To overview the impact of the transition area on the albacore behavior and distribution
Albacore catch around Japan

Japanese pole & line

Japanese long line
Logbook (2000-2016)

35°N

Catch ($\times 10^3$ ton)

Long line catch decrease in the northern area (>35N)
Research areas

April to March in 2002 and 2004

Recaptured individuals
Fork length: 71, 74, 77, 78 cm

Data interval: 512 seconds

Hokimoto and Kiyofuji, 2014;
Kiyofuji et al. 2013 (ISC/13/ALBWG-03/04)
Recovered 4 tracks from tags

All individuals move to eastward after release
Example of individual 1

Release 2 Apr, 2002
Recapture 25 Feb, 2003

Water temperature (℃)

Habitats based on thermal environment

ALB widely distribute in the mixed layer, while they stay at the surface in the strong thermocline
Classified habitat positions

Distinct depth change around the transition area
Daily averaged temperature

Min: 12.9°C, Mean: 18.0°C, Max: 20.9°C

The lower thermal limit is about 13°C
Interactive between the fish and fisheries

Kuroshio-Oyashio transition area

13°C (Thermal limit)
Conclusion

We investigated juvenile albacore distribution in the northwestern Pacific ocean by using archival tag.

Tagged albacore exhibit depth change related to water column: In well mixed layer, they widely distributed in the layer, while they stayed at the surface in the strong thermocline.

⇒ Distribution constraints may be linked to the fishery efficiency as it changes interaction depth of the fish and fisheries.

Thank you for your attentions.