Col.Vol.Sci.Pap. ICCAT, 28 : 183-185 (1988)

# IS THE CURRENT MONITORING EFFECTIVE FOR THE BLUEFIN TUNA STOCK ASSESSMENT IN THE WEST ATLANTIC?

*T. Nagai*
*Far Seas Fisheries Research Laboratory*
*5-7-1 Orido, 424 Shimizu, Shizuoka Pref., Japan*

## SUMMARY

Restraining the catches of small fish which is generally accepted to be an important measure in preserving and controlling a fish stock makes it difficult, ironically, to estimate the stock status of west Atlantic bluefin tuna. The cohort calculation for the west stock made in 1985 and 1986 is only a mirror reflecting the accumulated catches of ages 1 to 5 fish. In the west Atlantic, increasing the catches for monitoring to some extent should be considered to solve the existing situation with improvement of reliable abundance indices for small, medium-sized, and adult fish.

## RESUME

La restriction des captures de poisson de petite taille, qui est généralement admise comme une façon importante de conserver et de contrôler un stock de poisson, rend paradoxalement difficile l'estimation de l'état du stock de thon rouge de l'Atlantique ouest. Le calcul des cohortes effectué en 1985 et 1986 sur le stock occidental ne fait que refléter l'accumulation des prises de poisson des âges 1 à 5. Dans l'Atlantique ouest, l'accroissement des captures visant à suivre le stock dans une certaine mesure doit être considéré comme une façon de résoudre la situation actuelle en améliorant le recueil d'indices d'abondance fiables pour les poissons de petite, de moyenne et de grande taille.

## RESUMEN

El restringir las capturas de peces pequeños, que es una práctica generalmente aceptada como importante en la preservación y control de un stock de peces, irónicamente, dificulta la evaluación del estado del stock de atún rojo en el Atlántico Oeste. El cálculo de cohorte hecho en 1985 y 1986 para el stock del Oeste, tan solo refleja las captura acumuladas de peces de edad de 1 a 5. Debe considerarse el aumentar hasta cierto punto las capturas en el Atlántico Oeste destinadas a fines científicos, con el fin de facilitar la recogida de índices fiables de abundancia de peces pequeños, medianos y adultos.

The view of ICCAT on the west Atlantic bluefin tuna stock status swinged drasically based on cohort analysis calculations made for these recent two years (ICCAT 1985, 1986). In the 1986 Miami meeting, the 1973 cohort was appraised to be a ordinary one in the same level of 1969-1971 cohorts, though in the 1984 Dartmouth meeting it being estimated as a dominant year class which entered to the adult population in 1983 (Fig. 1).

In the Dartmouth meeting, a cohort run being carried out with the fishing mortality coefficients estimated from mark-recapture data using the Petersen method,a geometric mean of the population estimates at age 1 was calculated from the 1972 cohort onwards. On the other hand, in the Miami meeting the population estimates were determined so as to minimize the residual sum of squares of defined objective function under the sssumption that a selected partial recruitment among several patterns was correct. The assessment results of recruits at age 1 were well contrasted even if we take account of the facts that the catch-at-age data and estimation method used were different in those two meetings.

By the way, it is surprised that the population estimates at age 1 obtained in the Miami meeting and the ensuing 1986 Madrid meeting are fairly in parallel with the catches of ages 1 to 5 fish accumulated by year class, as is evident from the figure 1. And it could not help surprising that the 1984 cohort was estimated at only 7,500 fish in the Madrid meeting. Those facts indicate the important problems are unsolved : the year class strength of 1973 cohort is actually uncertain ; the 1982 cohort which is considered to be strong among the recent year classes is clearly underestimated.

In the west Atlantic some countries have already restrained catching the small fish since 1976. From 1982 onwards, the monitoring has been continued with limiting the amount of yield. As a result the catch in number of fish aged 1-5 is only about 10,000 since 1982 (Fig. 2).

The estimated population number at age 1 is 127,000 fish(geometric mean) in the west Atlantic,while that in the east Atlantic being estimated at about 1,200 thousands fish. If these two estimates are correct, it means that the productivity in the west Atlantic stock is about one-tenth of the east Atlantic stock. Considering the age 0 fish being caught in large numbers in the Mediterranean Sea and the catches of small fish including the age 0 fish being underreported from there, the value, one-tenth, is underestimated (Nagai, Hayasi and Yonemori 1987).

The development of fisheries in the west Atlantic started behind of that in the east Atlantic and the catches have always been small. The catches of ages 1 to 5 fish in the west Atlantic reached a maximum of 320 thousands fish in 1970, with an annual average of 110 thousands fish from 1970 onwards. On the contrary 520 thousands fish aged 1-5 being caught annually in the east Atlantic. It might be possible that the smaller population estimates in the west Atlantic originated from the smaller catches.

In the west Atlantic, the current monitoring makes it difficult to estimate the stock status of the species. To increase the catches for monitoring to some extent should be considered to solve the existing circumstances with improving to collect reliable abundance indices for the small, the medium-sized, and the adult fish.

## References

ICCAT 1985: Report of the meeting of the bluefin working group, Canada, September-October, 1984. Int. Comm. for the Conserv. of Atlantic Tuna, CVSP XXII: 1-264.

ICCAT 1986: Report of the meeting of the bluefin working group, Miami, Florida, U.S.A., September, 1985. Int. Comm. for the Conserv. of Atlantic Tuna, CVSP XXIV: 1-254.

Nagai, T., S. Hayasi and T. Yonemori 1987: A proposal to management of bluefin tuna stock in the western Atlantic based on information obtained by September,1986. Int. Comm. for the Conserv. of Atlantic Tuna, CVSP XXVI: 276-282.

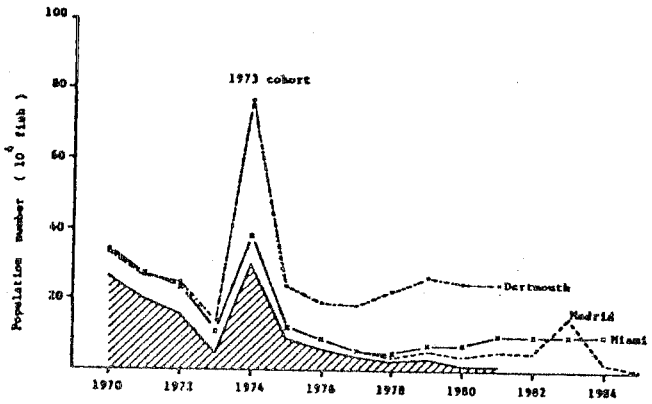


Fig. 1. Comparison of populationnumber at age 1 estimated at the recent three meetings.
( The shaded area indicates the catches of ages 1 to 5 fish accumulated by year class )

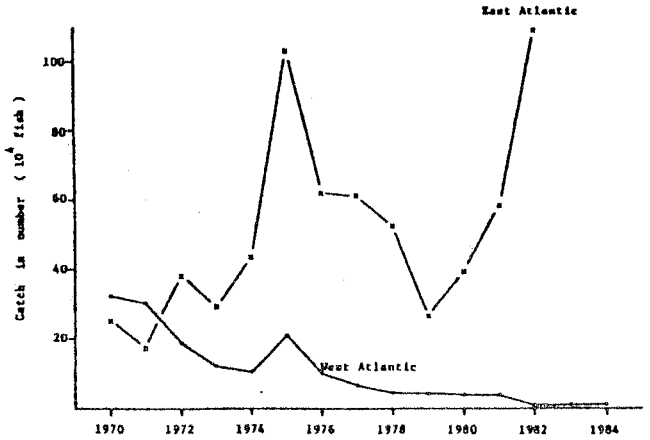


Fig.2. Trends of catches of ages 1 to 5 fish in the west Atlantic and in the east Atlantic.