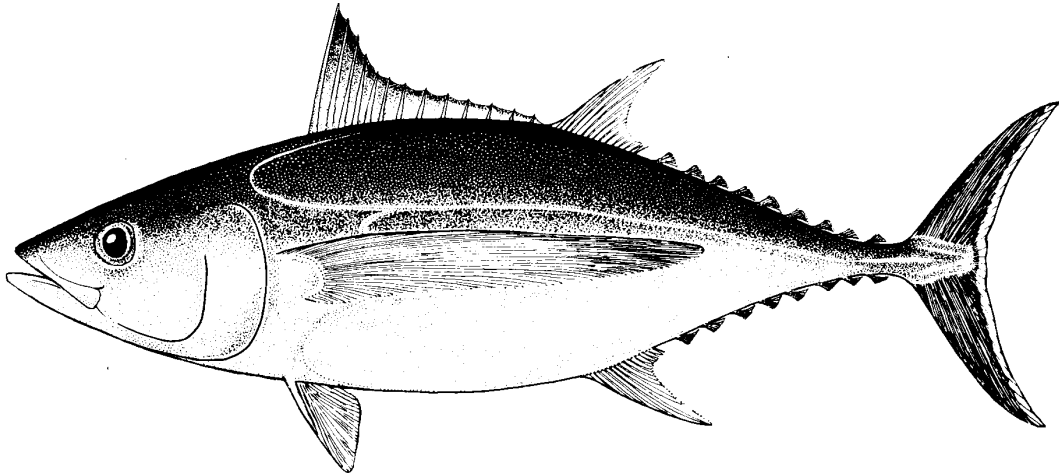


ALB-4



Further information on targeting in the south Pacific albacore fishery



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1 Introduction

The fourteenth meeting of the Standing Committee on Tuna and Billfish (SCTB14) considered a paper (SWG-11 : *Taiwanese distant-water longline catch characteristics with regards to albacore targeting*) that attempted to identify and distinguish trends in targeting by the Taiwanese distant-water longline fleet. The conclusion found that it was difficult to distinguish where targeting occurs, and the species composition of the catch was probably more dependent on the relative availability of the tuna species (i.e. albacore, bigeye and yellowfin) in the different areas being fished.

The SCTB14 suggested the original review be expanded to "...*Examine the targeting of albacore by longliners, by year and MULTIFAN-CL area.*". The Taiwanese distant-water longline fleet has fished the most widespread and consistently throughout the south Pacific albacore fishery and therefore forms the basis of this review.

Source of Data

- Aggregated longline data were provided by National Taiwan University (NTU) for 1967-1993, while the Council of Agriculture provided data for 1994-1996; the latter data were processed by the Overseas Fisheries Development Council of the Republic of China (OFDC). The 1967-1993 data were corrected for landings by the OFP, following the method in Lawson (1997), while the 1994-1996 data were corrected for landings by OFDC. Data for years 1997-1998 were provided by Dr Shyh-Bin Wang on 4th April 2001. Data for years 1999-2000 were provided by Dr Shyh-Bin Wang on 13th June 2002 (Data for 2000 are considered provisional). Data are available from published bulletins of catch and effort statistics and are, therefore, public domain. The data provided are stratified by month and 5°x5° grid. The data from the distant-water fleet are assumed to provide 100% coverage. Note that these data do not cover the Taiwanese offshore longline fleet that are based out of ports of SPC member countries since the late 1980s (e.g. Guam, Pohnpei, Koror, Chuuk, Majuro). Nor do these data cover the Taiwanese coastal longline fishery based out of Tung Kang, Taiwan. Catch, in numbers and weight, have been provided.

2 Methodology/Results

This review only intends to provide a qualitative interpretation of the available data in the hope that particular areas may be identified and expanded on in future, more quantitative, analyses if required.

The sections below deal with trends in the species composition of albacore (numbers of fish) in the total tuna (albacore, bigeye and yellowfin) catch (numbers of fish) for

- All years combined and each 5° latitude band in the south Pacific (where fishing took place);
- Five-year periods and each 5° latitude band;
- Quarters and each 5° latitude band;
- 5° latitude band by longitude(5°).

The 95% confidence intervals for each data point and lines delineating the Multifan-CL areas have been included.

2.1 Year by latitude

Figure 1 shows the species composition of albacore for all years combined. It is clear from this graph that albacore are by far the most predominant species in the south and central Multifan-CL areas, with the lowest catches and greatest variation in species composition seen in the northern area.

Figure 2 shows the species composition of albacore for each five-year period since 1967. These graphs all show similar trends in composition by latitude, which is virtually 100% albacore with low variance in the south to an average of 29% albacore and very high variance in the north. The main deviations from the average albacore proportions occurred in 1967-1970, where the albacore proportion for the most northern area is more than double the average over all years for that area, and 1986-1990 and 1991-1995, where there was a negligible amount of albacore in the catch for the most northern area. The trend in albacore proportion from the southern latitudes to the most northern latitudes is consistent, except perhaps for 1996-2000 where the albacore proportion for the 5-10° latitude band is lower than you would expect from looking at the other graphs. When looking at these graphs it is important to note that there has been very little catch in the 0-5° region since 1982, which is clearly shown in Figure 5.

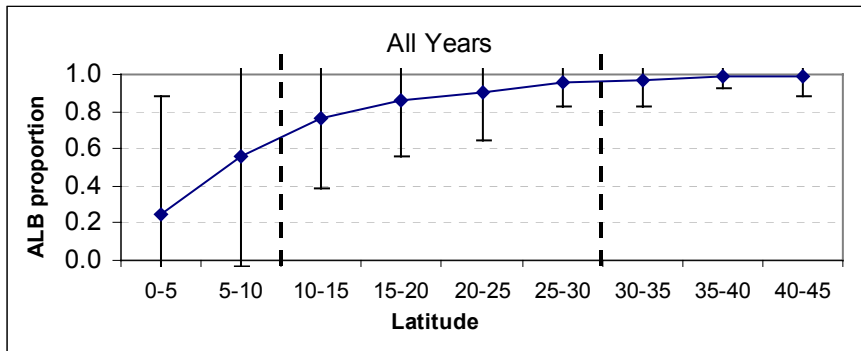
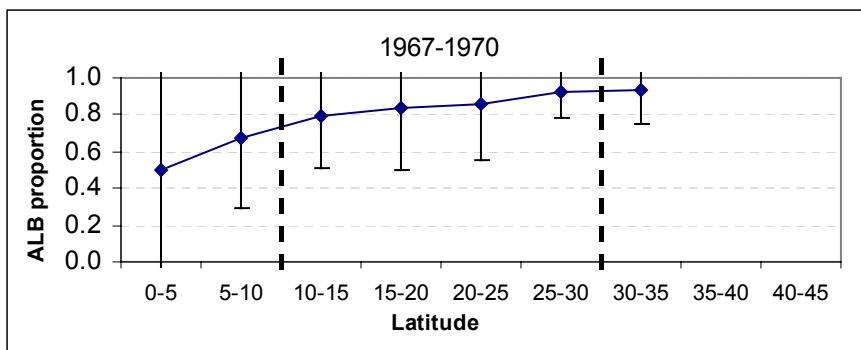
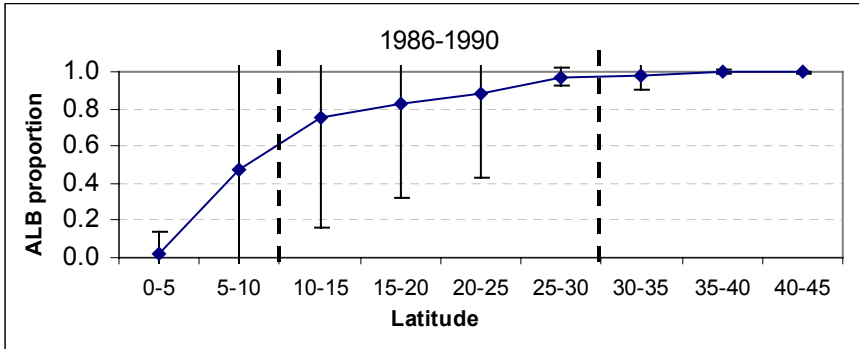
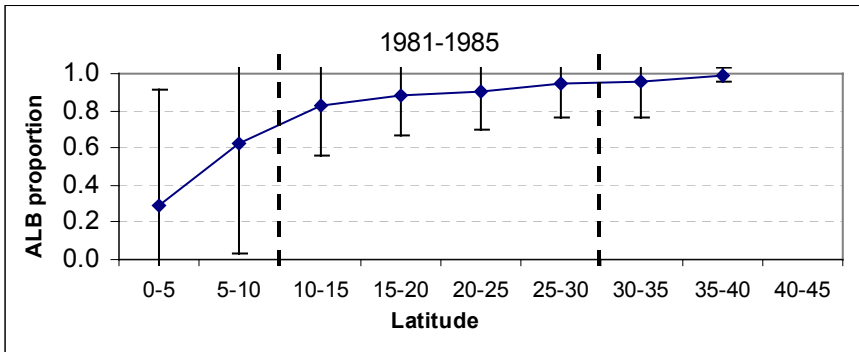
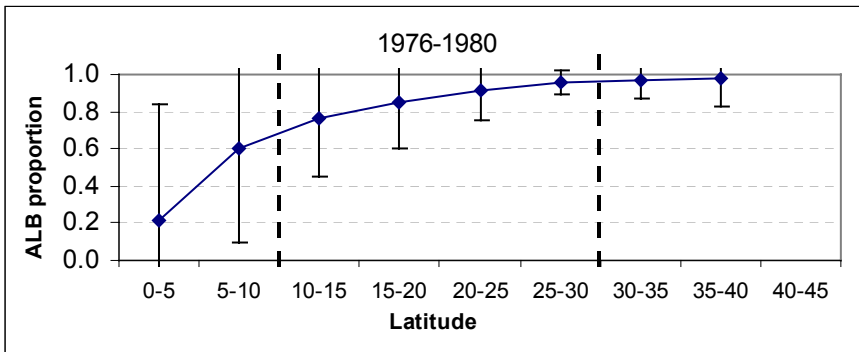
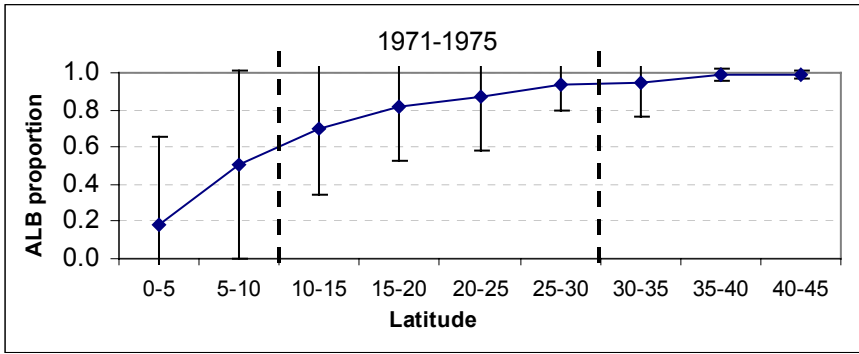


Figure 1. Albacore species composition by latitude band for all years combined (Taiwanese distant-water longline catch). Dashed vertical lines separate the northern, central and southern MULTIFAN-CL areas for south Pacific albacore.





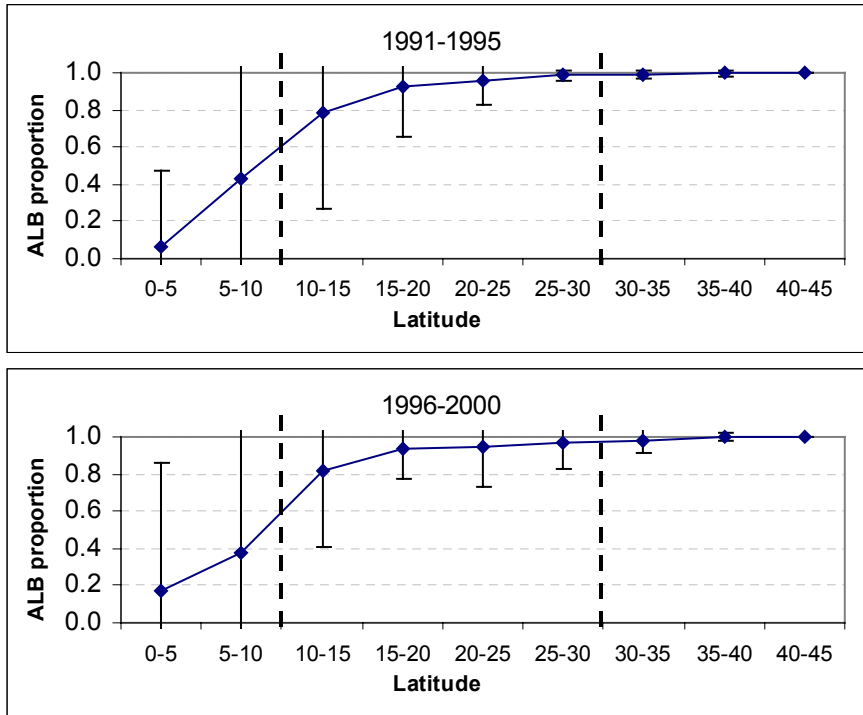
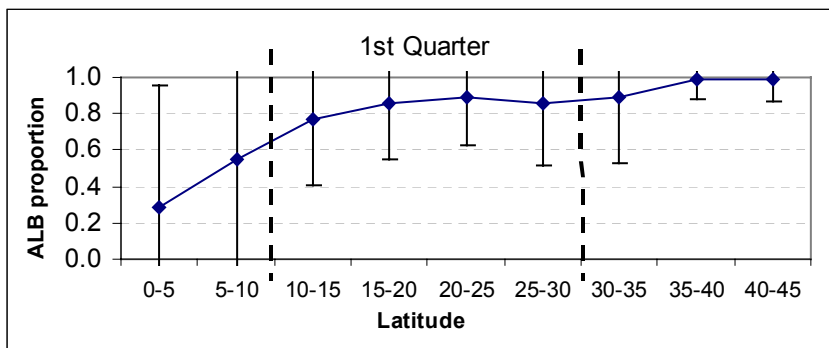


Figure 2. Albacore species composition by latitude band and five-year period (Taiwanese distant-water longline catch). Dashed vertical lines separate the northern, central and southern MULTIFAN-CL areas for south Pacific albacore.

2.2 Quarter by latitude

Figure 3 shows the species composition of albacore by quarter and latitude for all years combined. The greatest variation by quarter seems to be in the middle Multifan-CL area. The proportion of albacore caught in the 10-25° band peaks during the 4th quarter (austral spring-summer) and is at its lowest during the 2nd quarter (austral autumn). These are the months that have been known to have relatively higher bigeye and yellowfin catches in certain points of this area. There is also an interesting drop in albacore proportion with high variance in the 1st quarter between 25° and 35° latitude, which could be due to a complex seasonal effect. In general, the albacore proportions are 20-40% at 0-5° latitude, 50-60% at 5-10° latitude, and 70-80% at 10-15° latitude.



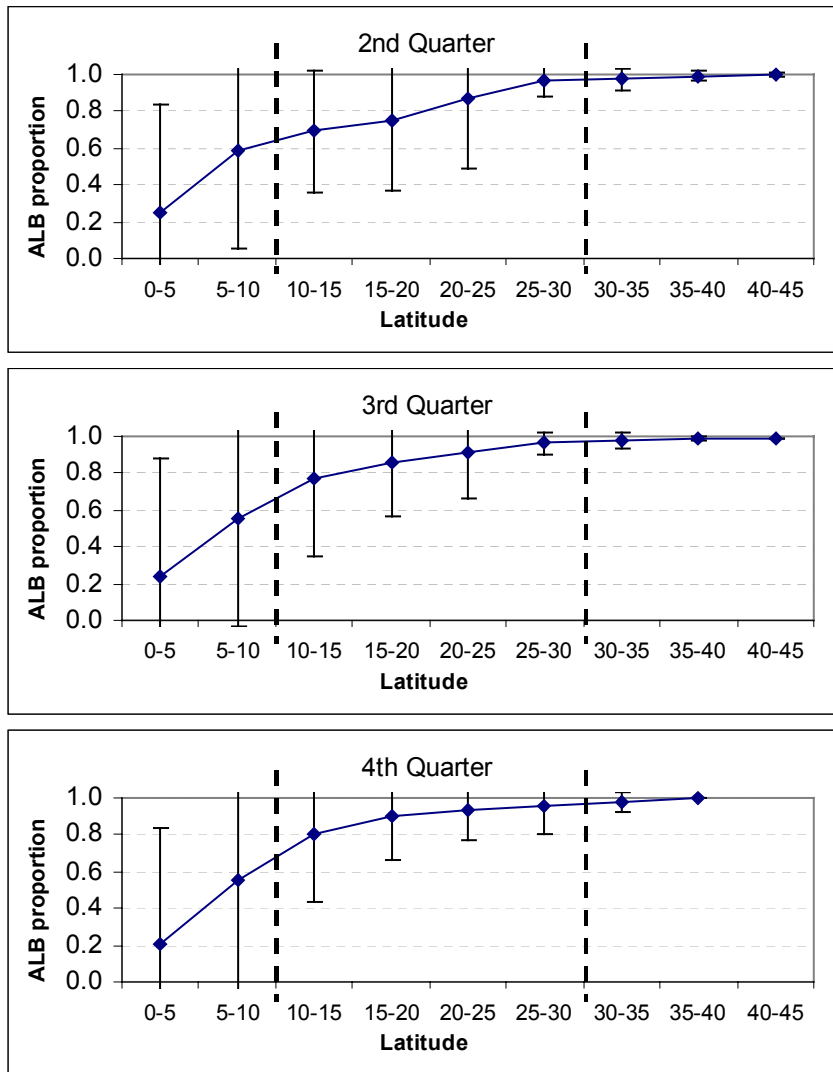
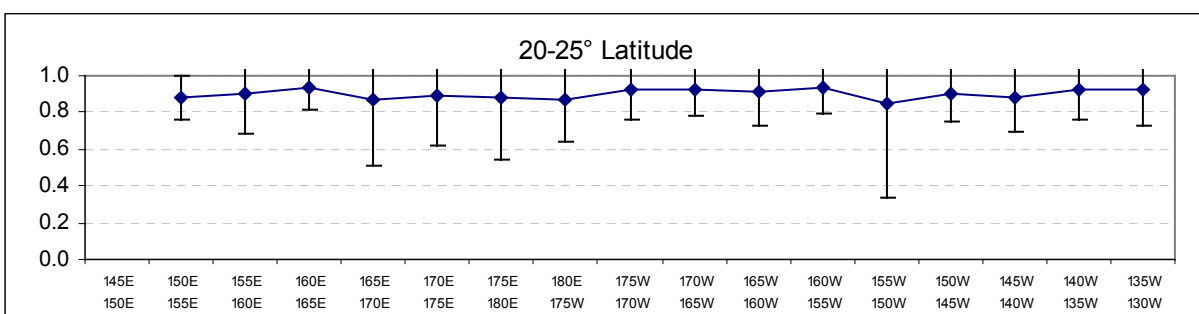
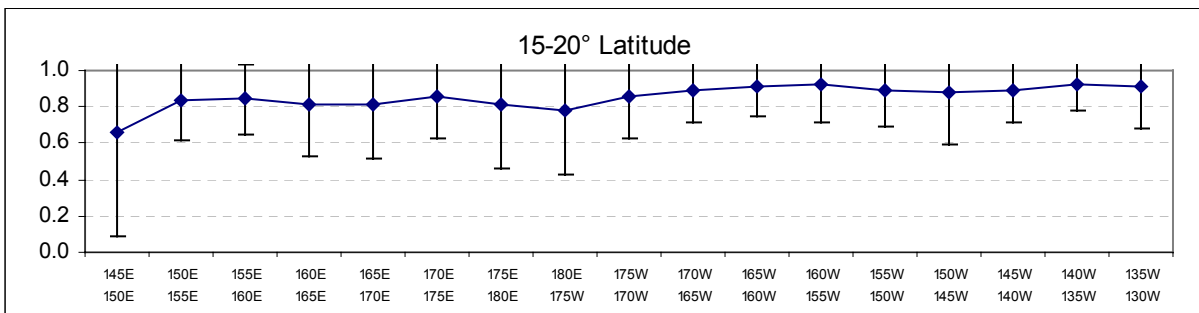
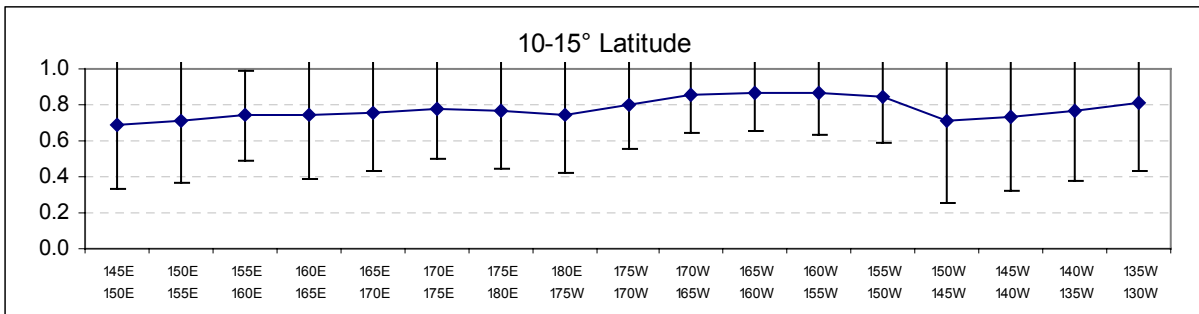
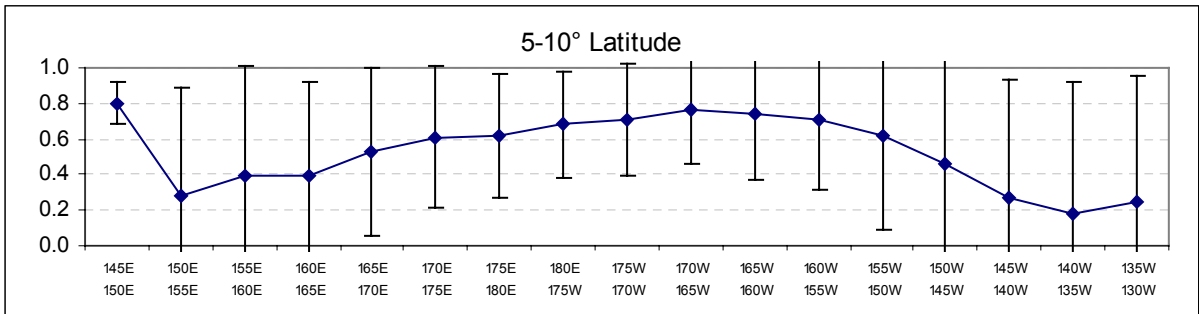
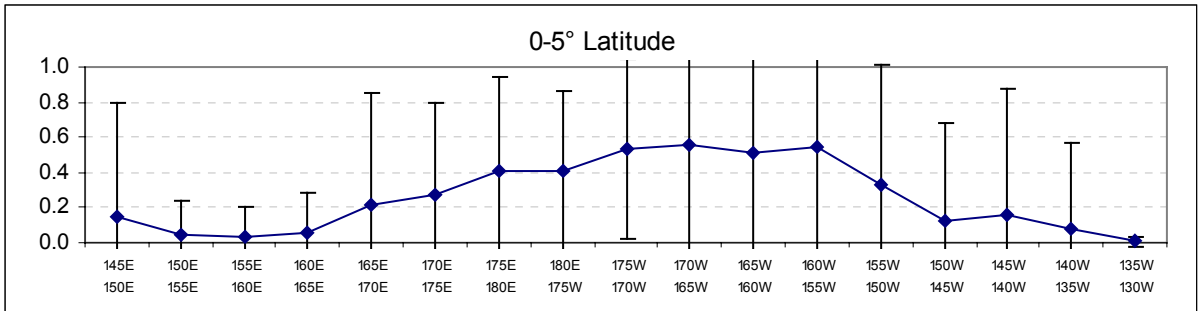


Figure 3. Albacore species composition by latitude band and quarter (Taiwanese distant-water longline catch). Dashed vertical lines separate the northern, central and southern MULTIFAN-CL areas for south Pacific albacore.

2.3 Longitude by latitude band

Figure 4 shows the proportion of albacore caught by 5° latitude band and longitude for all years. The graphs of most interest are the 0-5° latitude and 5-10° latitude plots where the albacore proportion varies considerably over longitude. The lowest values are west of 175°E and east of 150°W. In between those longitudes albacore is caught in much higher proportions, more than twice the average for the 0-5° latitude band between 175°W and 150°W longitude. The 5-10° latitude band shows a similar trend with the middle longitudes having a much higher albacore proportion, and the western and eastern longitudes having lower than average albacore catch, apart from 145°E-150°E which has the highest proportion of all, but this point has only 2 replicates. South of 10°, this trend disappears.



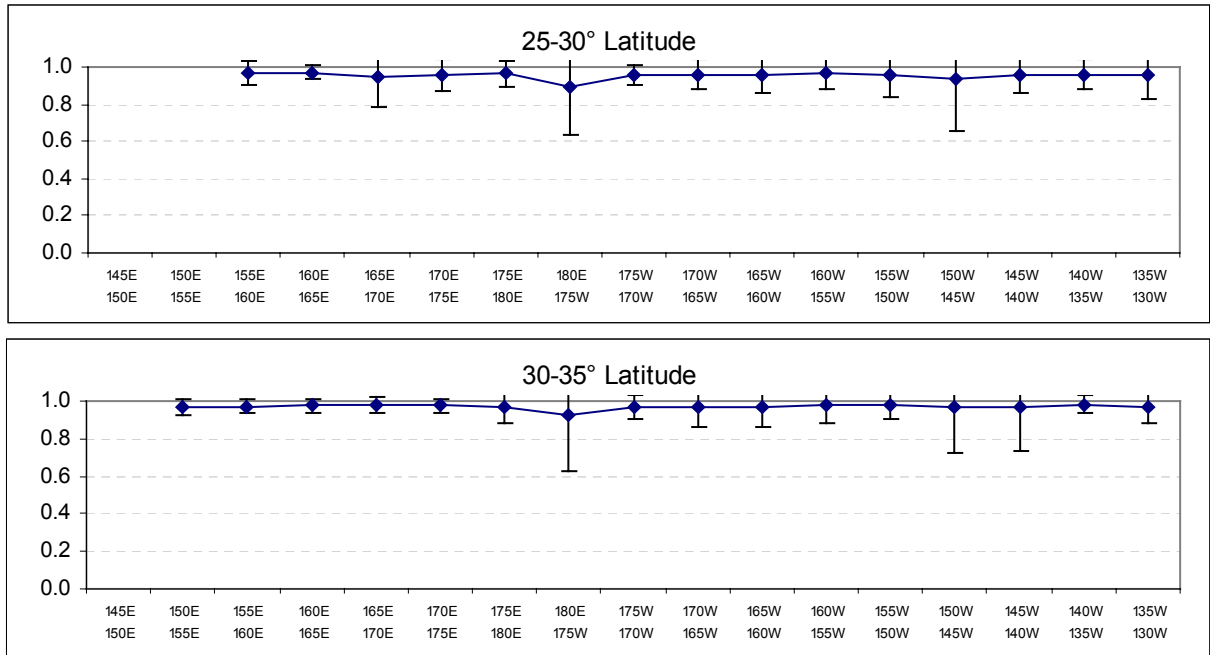


Figure 4. Albacore species composition by longitude for each latitude band (Taiwanese distant-water longline catch). Dashed vertical lines separate the northern, central and southern MULTIFAN-CL areas for south Pacific albacore.

Figure 5 shows the catch by sub-area in more detail for the most northern latitude bands. The top 3 bands have been split into 3 longitude areas, and the number of albacore plotted with the combined catch of bigeye and yellowfin by year. These graphs show that very little albacore was caught in the 0-5° latitude, 145°E-175°E longitude area, and that the number of fish caught in this region generally decreased from 1971 to 1982, after which we see virtually no fish caught in this region. In the 0-5° latitude, 150°W-80°W longitude area, very little albacore has been caught since 1988, but the catch in this region is also very low compared to other areas. The highest catch in this area was for the year 2000 which stands out as the highest effort so far east in recent years and also the highest non-albacore catch in the region north of 10° and east of 175°E since 1980 (Presumably the vessels in this area are lower and targeting bigeye).

In general, the regions where the proportion of albacore is lowest corresponds to areas where total catch is lowest.

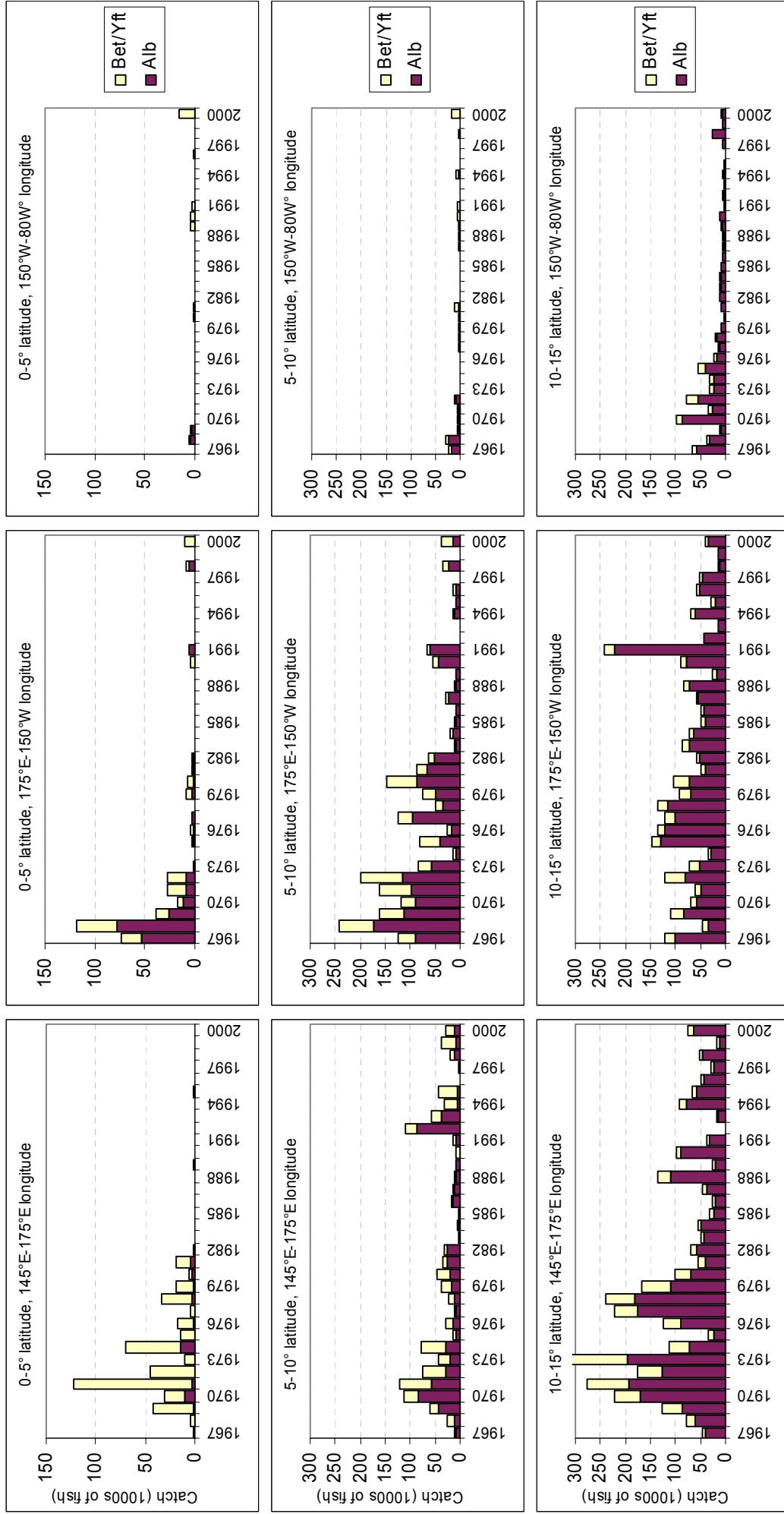


Figure 5. Catch of albacore and bigeye/yellowfin combined by latitude band, longitude band, and year (Taiwanese distant-water longline catch).

3 Conclusions

- From 25° southwards, albacore proportion is close to 100% and there is not much variance over any of the strata presented in this paper for these latitudes.
- North of 25°, the albacore proportion decreases almost exponentially. The variance becomes very high between 0-10°, due to high variation of albacore proportion by longitude for those bands, and presumably by season and year. It seems that between 175°E and 150°W albacore is more abundant than other areas in this latitude band.
- Bigeye targeting in the east is clearly apparent in recent years (adjacent to EPO bigeye fishing grounds).
- Temporal trends appear to not be as great as trends by area. There are variations by year and latitude, but the overall trend is fairly consistent. Variation by quarter is also apparent, showing seasonal variation.
- Changes to the south Pacific albacore MULTIFAN-CL areas may be considered. The lowest Multifan-CL area could possibly be extended 5° further north from 30° to 25°. The middle area could be extended further north for middle longitudes (175°E-150°W), leaving the top area as two sub-areas in the 0-5° latitude band west of 175°E and east of 150°W. In any event, perhaps a more detailed review with statistical analyses would support such changes.