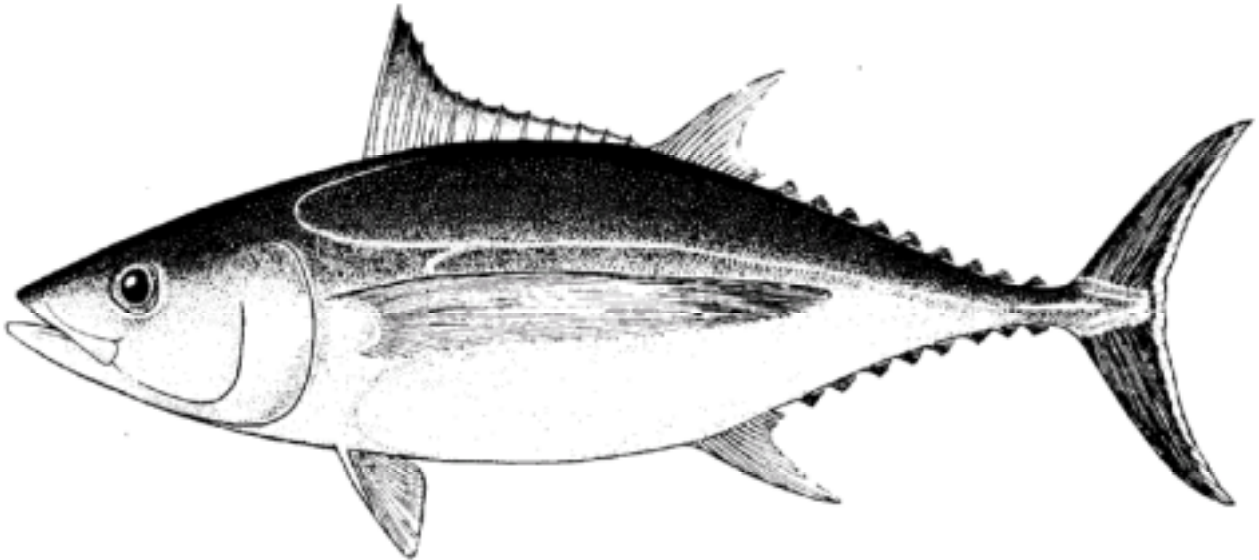**Taiwanese distant-water longline catch
characteristics with regard to albacore targeting**

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1 INTRODUCTION

This paper provides a simple analysis of catch by Taiwanese distant water longliners in the South Pacific. The aim is to see if it is possible to identify any trends in targeting, and especially trends for targeting species other than albacore. The current assumption is that the Taiwanese target albacore all of the time.

2 SOURCES OF DATA

Two sources of data were analysed separately:

- Logsheet data provided to SPC member countries by Taiwanese distant water longliners.

- Aggregated longline data were provided by National Taiwan University (NTU) for 1967-1993, and by the Council of Agriculture for 1994-1998; 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 1994-1998 data were corrected for landings by OFDC. The data provided are stratified by month and 5°x5° grid. The data from the distant-water fleet have been raised on the basis of landings to represent full coverage. Note that these data do not cover the Taiwanese offshore longline fleet that are based out of ports of in Micronesia 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. Catches have been provided in numbers and weight.

3 METHODOLOGY

3.1 Method of Analysis

For the logsheet data, the replicate used was a single trip. Trips were split when they crossed a stratum boundary, for example half the sets may have been in 1998 and the other half in 1999, so the trip would be split accordingly. For the aggregate data, the replicate was an aggregate by year, month and 5x5 degree square.

The raw data were stratified by year, quarter, latitude and longitude. The following ranking method was then used:
- For each replicate, the catch for three species (albacore, bigeye and yellowfin) was ordered from highest to lowest and assigned a corresponding ranking value of 1, 2 or 3.
- The data were then grouped according to the strata and the average ranking for each species and stratum was calculated, along with the standard deviation to provide confidence intervals.

3.2 Assumptions:

- For logsheet data, assume that the vessel was targeting the same species for the duration of the trip.
- For logsheet data, trips were identified as distant water by the GRT, ports of departure and return and trip duration.
- Geographic area was limited to areas south of the equator.

4 RESULTS

4.1 Logsheet data

The logsheet data indicate that mostly albacore were caught from almost all of the trips as the table below shows:

Rank	ALB		BET		YFT	
1	461	98.3%	3	0.6%	7	1.5%
2	0	0.0%	87	18.6%	410	87.4%
3	8	1.7%	379	80.8%	52	11.1%

Table 1 - Rankings for the three species showing number of trips and percentages

Of the 469 trips, 8 resulted in albacore not having the highest catch. Six of these were for trips in 1990 and were logsheets provided by Kiribati, and are in fact the only Taiwanese logsheets provided by Kiribati. The other two trips were by one vessel based in Fiji in 1998/1999.

These results are not surprising, however, because the logsheets received by SPC are from vessels that are offloading to albacore canneries in Pacific countries. A spatial plot showing the relative catch by 5x5 degree square and species portions is in the appendices. In the lower latitudes, albacore comprises virtually all of the catch, while yellowfin catch becomes significant at higher latitudes around the yellowfin grounds.

4.2 Aggregated data

The following charts show the results of the aggregated data stratified by quarter, latitude, and longitude. The error bars on the charts are the 95% confidence intervals. There is clearly no trend by quarter, but there are definite trends by latitude and longitude. Albacore dominate the catch at southern latitudes, but is not the dominant catch in the 0-5S band. This has obvious effects on how to interpret the longitude data since the variation in albacore catch by longitude is due almost entirely to the top 5-degree latitude band.

In the appendices is a spatial plot of the Taiwanese catch that uses pies to show the magnitude of the catch and species proportions. This shows the change in yellowfin proportion around the yellowfin grounds, and also shows that the Taiwanese caught relatively few fish in the 0-5S degree band.

Due to the lack of more detailed information, it is not possible to tell whether the Taiwanese are actually targeting yellowfin or are catching yellowfin as by-catch because of the location. It is always possible that there may be distinct fleets fishing in the same area, with one targeting albacore and the other targeting yellowfin.
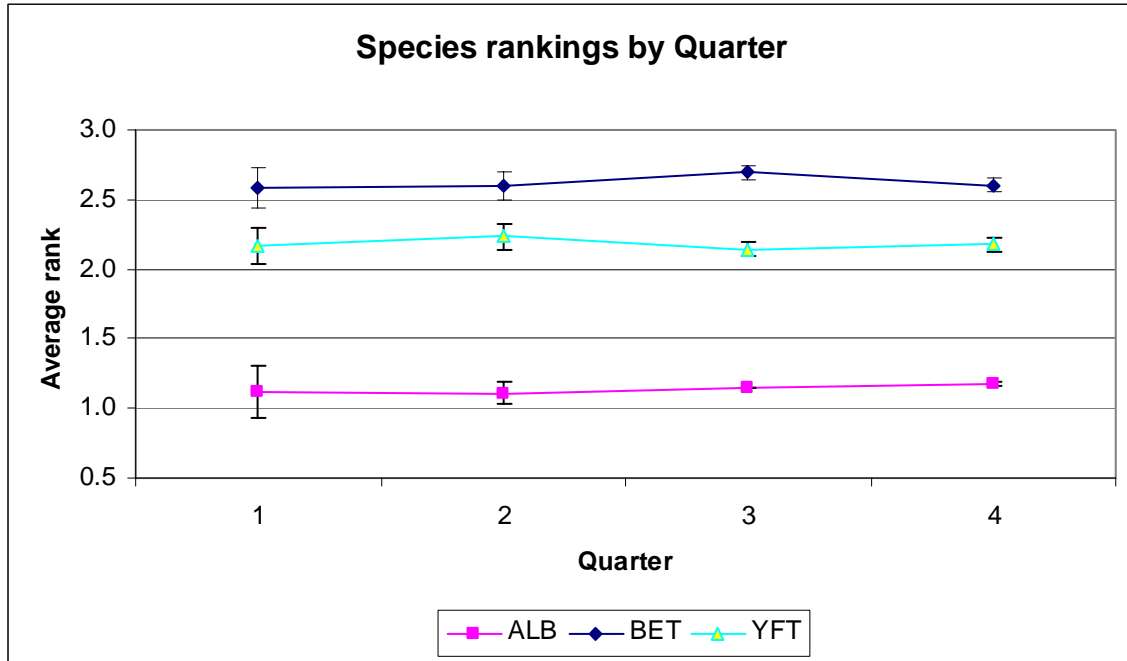
Figure 1 - Average ranking by species and quarter
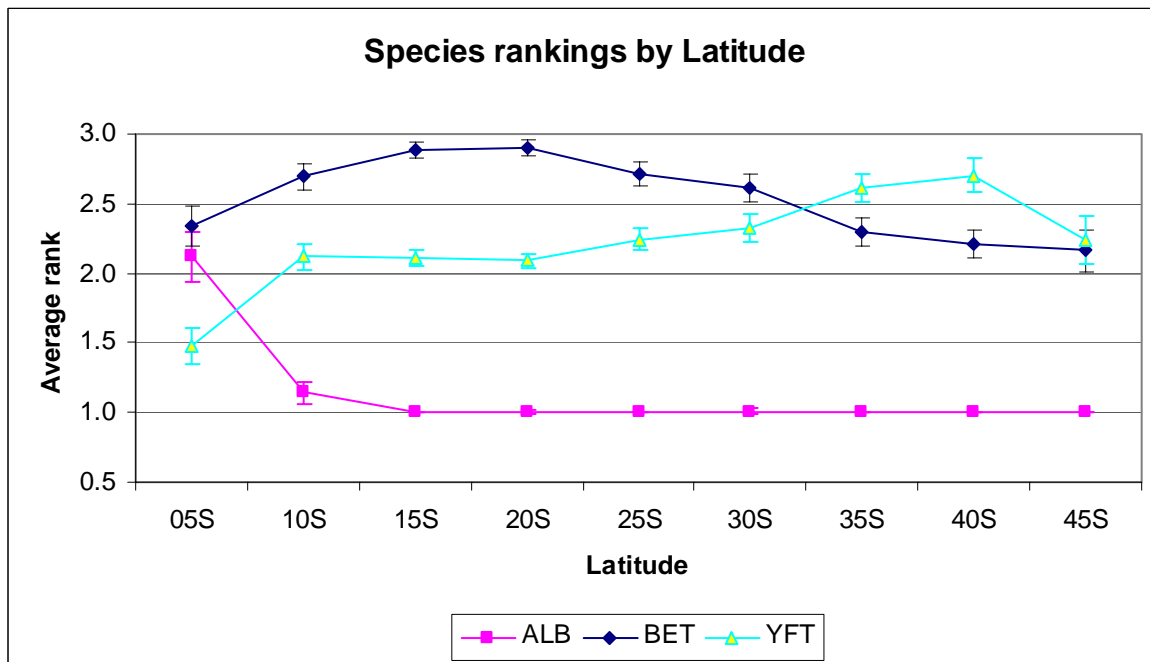
Figure 2 - Average ranking by species and latitude
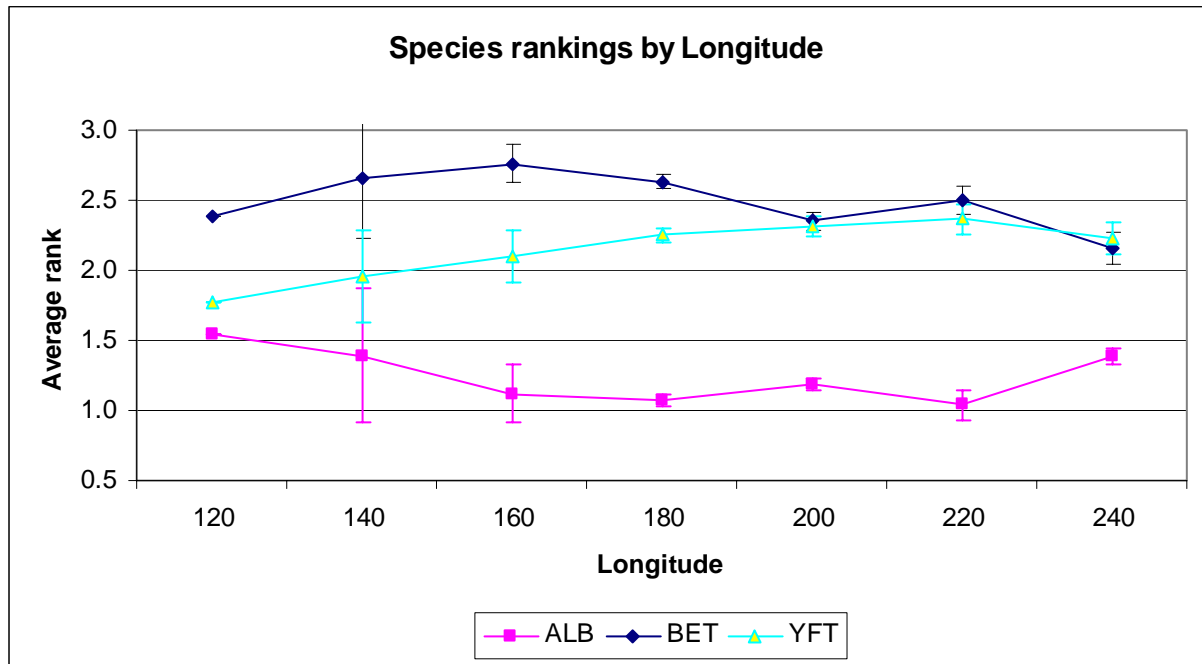
**Figure 3 -** Average ranking by species and longitude

5 CONCLUSIONS

From this brief analysis, it is difficult to identify targeting of species other than albacore, particularly at low latitudes. Logsheet data show no indication of non-albacore targeting, but the data are biased since the vessels for which SPC receives logsheets are unloading to albacore canneries. The aggregate data indicate that the number of yellowfin caught increases as expected in the areas where yellowfin are known to live. It is difficult to say that the Taiwanese are actually targeting yellowfin in that area since they still catch a substantial amount of albacore. However, the amount of effort from the fleet is not high in areas where the albacore catch is low, so perhaps this is an indicator that yellowfin is just a by-catch.
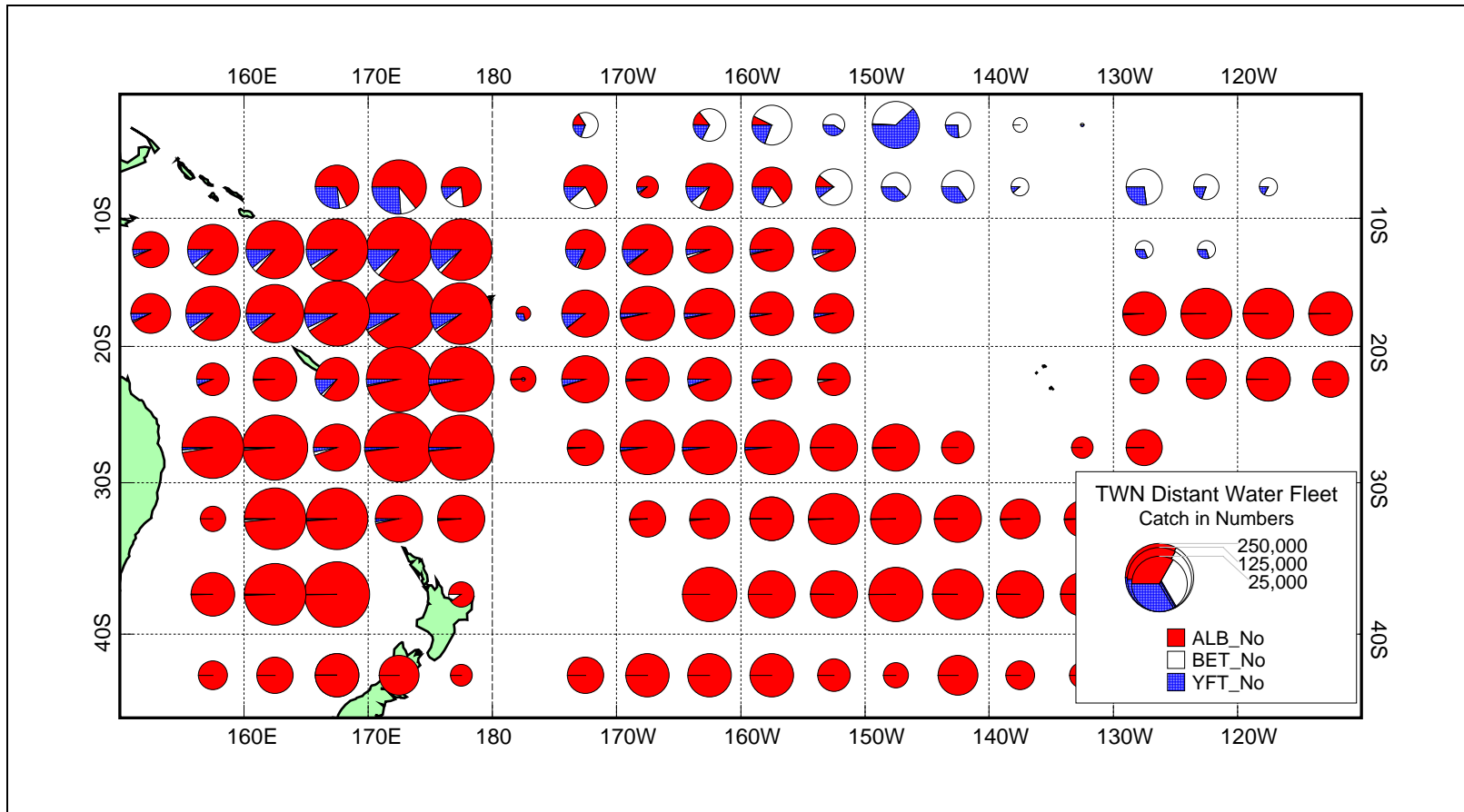
6 REFERENCES

Lawson, T.A. 1997. Review of catch estimates for Taiwanese distant-water longliners. OFP Internal Report No. 31 (Revised May 1997). Secretariat of the Pacific Community, Noumea, New Caledonia. 21 pp.
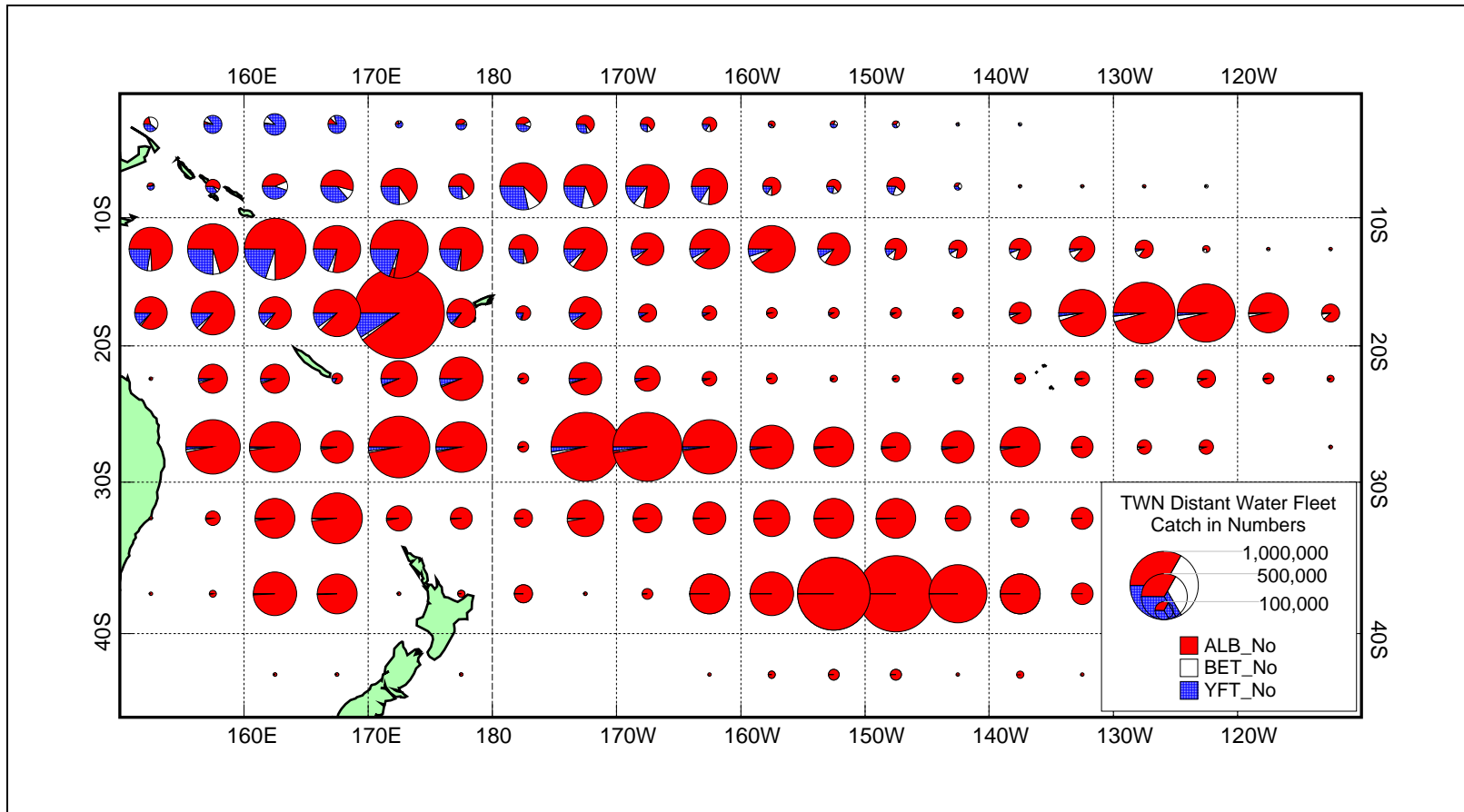
7 APPENDICES
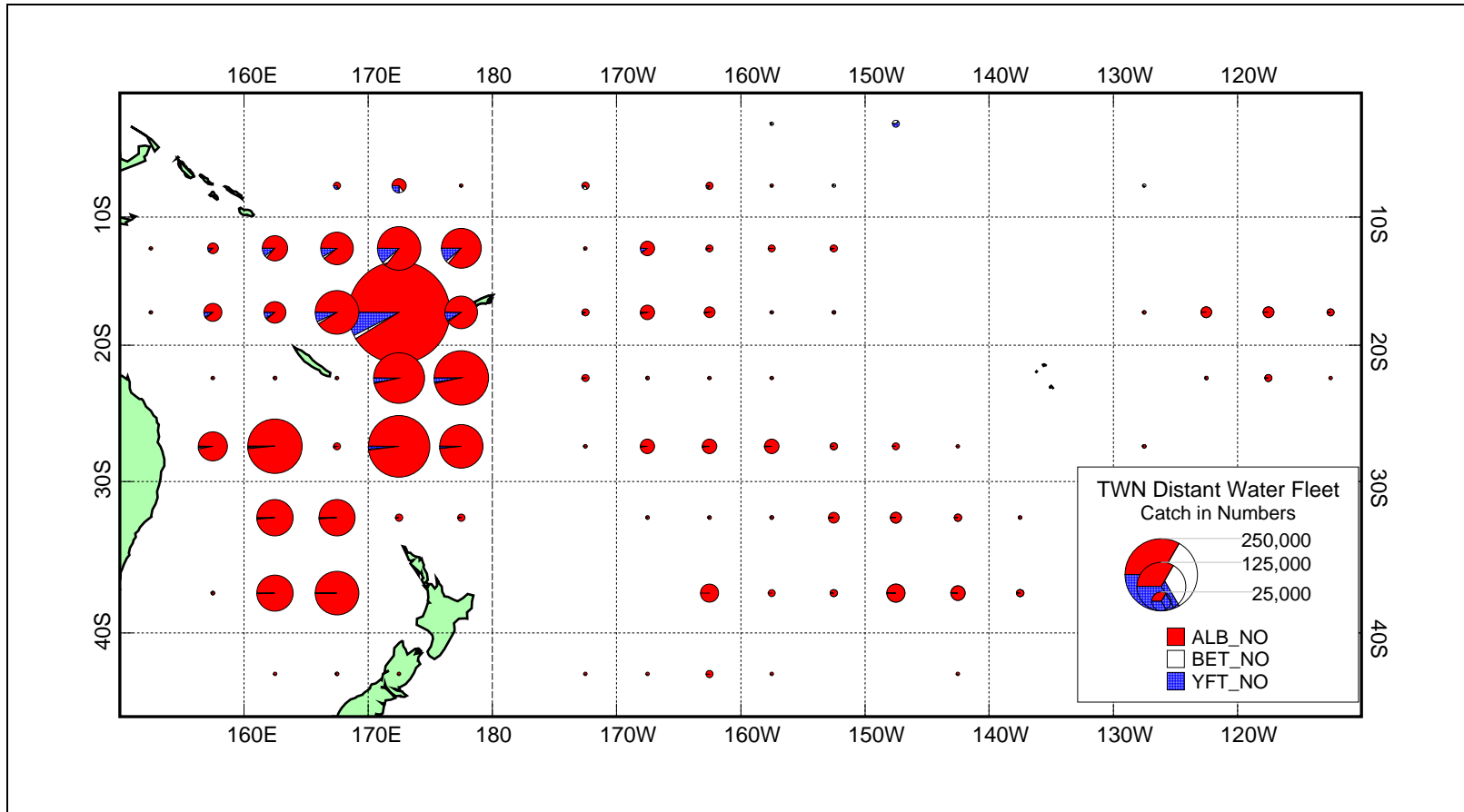
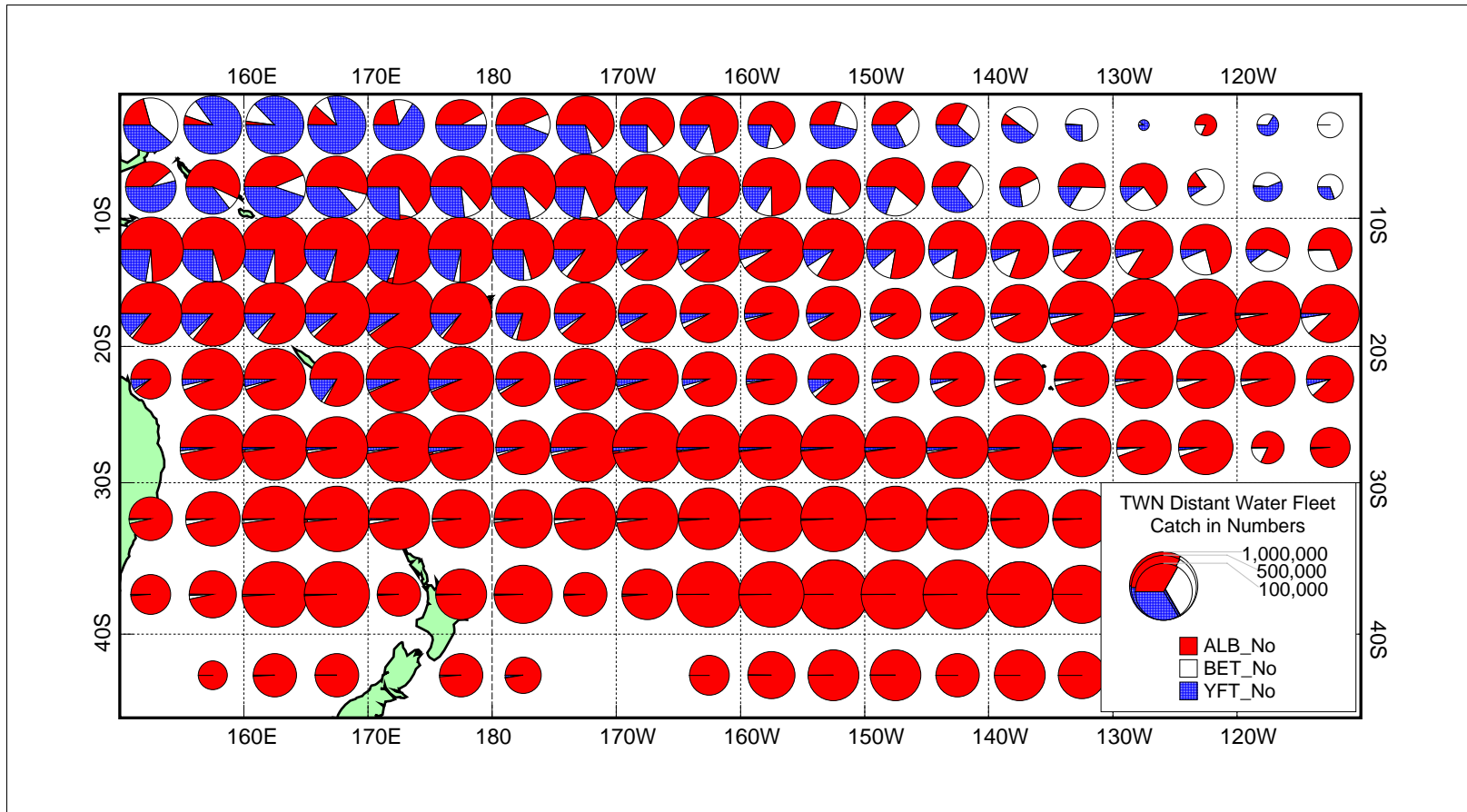**Figure 4 -** Taiwanese distant water fleet catch showing proportions by species – logsheet data

Figure 5 - Taiwanese distant water fleet catch showing proportions by species – logsheet data with log scale for catch

Figure 6 - Taiwanese distant water fleet catch showing proportions by species – aggregated data

Figure 7 - Taiwanese distant water fleet catch showing proportions by species – aggregated data with logscale for catch