Western and Central Pacific Fisheries Commission

SCIENTIFIC COMMITTEE
EIGHTH REGULAR SESSION

Busan, Republic of Korea
7-15 August 2012

A compendium of fisheries indicators for bigeye, skipjack, yellowfin, and south Pacific albacore tunas and south Pacific swordfish

WCPFC-SC8-2012/SA-WP-02

Shelton Harley, Peter Williams and John Hampton[1]

[1] Oceanic Fisheries Programme, Secretariat of the Pacific Community

A compendium of fisheries indicators for bigeye, skipjack, yellowfin, and south Pacific albacore tunas and south Pacific swordfish

Shelton Harley, Peter Williams, and John Hampton
Oceanic Fisheries Programme, Secretariat of the Pacific Community

Abstract

This paper presents a compendium of fishery indicators for the principal target tuna species – bigeye, skipjack, yellowfin, and south Pacific albacore tuna, and south Pacific swordfish. The fishery indicators presented here complement the information provided in full assessments, and provide the latest fishery information for stocks for which full assessments have not been conducted. The indicators that are documented include: total catch by gear, nominal CPUE trends, spatial distribution of catch and associated trends, size composition of the catch and trends in average size. These include data loaded into the WCPFC databases at 5 July 2012.

The Scientific Committee is invited to both note the report, but also provide guidance on the utility of this report as an annual product for key stocks to complement information provided in the assessments and the general working paper that summarizes the WCPO fisheries.

1.   Introduction

The Scientific Committee's Work Programme for 2008-2010, developed at its 3rd session, included Project 24: Development and reporting of stock indicators for those key species not formally assessed. Reporting of stock indicators was first undertaken at SC4 in 2008 with the paper of Hampton and Williams (2008). In 2011, with no tropical tuna assessment planned for 2012, the Scientific Committee requested that indicators be developed for those stocks for which formal stock assessments are not being undertaken. This paper responds to this request and includes a compendium of fishery indicators for the principal target tuna species - skipjack, yellowfin, bigeye and South Pacific albacore tuna – and south Pacific swordfish.

We first provide fishery indicators for the three tropical tunas not under assessment in 2012 and then cover the remaining two stocks scheduled for assessments this year.

2.   Indicators and data sources

A range of indicators are provided in the following series of graphs and are based upon an equally wide range of data extracts. Table 1 provides details of the data extracts that support the figures – including the SQL calls used. Data used in the analysis is that loaded into the WCPFC databases at 5 July 2012.

Table 1 Data extracts for the indicator paper. Note that some figures include data from more than one database.

Figures	Data source	SQL call
1, 7, 13, 19, 24	Annual catch estimates from Yearbook	`yb <- get.logdata(sqlcall="SELECT gr_id, yy, ocean_id, sum(alb_c), sum(bet_c), sum(skj_c), sum(swo_c), sum(yft_c) FROM a_yearbook WHERE ocean_id IN ('SP','SX','WP','WX') GROUP BY gr_id, yy, ocean_id")`
2, 3, 4, 9, 14, 15, 16, 20, 21, 25, 26	Aggregate catch and effort data by gear, flag, and year and 5x5 degree area	`aggr <- get.logdata(sqlcall="SELECT gr_id, ocean_id, flag_id, yy, lat_short, lon_short, sum(days), sum(sets), sum(hhooks), sum(stdeff), sch_id, sum(alb_c), sum(alb_n), sum(bet_c), sum(bet_n), sum(skj_c), sum(skj_n), sum(swo_c), sum(swo_n), sum(yft_c), sum(yft_n) FROM a_model GROUP BY gr_id, ocean_id, flag_id, yy, lat_short, lon_short, sch_id")`
2, 8, 10, 14	Pole and line aggregate catch and effort data by flag and year and 1x1 degree area	`pagg <- get.logdata(sqlcall="SELECT ocean_id, flag_id, yy, lat_short, lon_short, sum(days), sum(alb_c), sum(bet_c), sum(skj_c), sum(yft_c) FROM p_best GROUP BY ocean_id, flag_id, yy, lat_short, lon_short")`
2, 4, 8, 10, 14, 16	Purse seine aggregate catch and effort data by flag and year and 1x1 degree area	`sagg <- get.logdata(sqlcall="SELECT ocean_id, flag_id, yy, lat_short, lon_short, sch_id, sum(days), sum(stdeff), sum(bet_c), sum(skj_c), sum(yft_c) FROM s_best GROUP BY ocean_id, flag_id, yy, lat_short, lon_short, sch_id")`
5, 6, 11, 12, 17, 18, 22, 23, 27, 28	Catch at size data	These data reflect a detailed analysis of size frequency data, plus aggregate data and annual catch estimates.

3.   References

Hampton, J., and Williams, P. 2008. A compendium of fisheries indicators for target species. WCPFC-SC4-2008/SA-WP-09.

3.1   BIGEYE TUNA
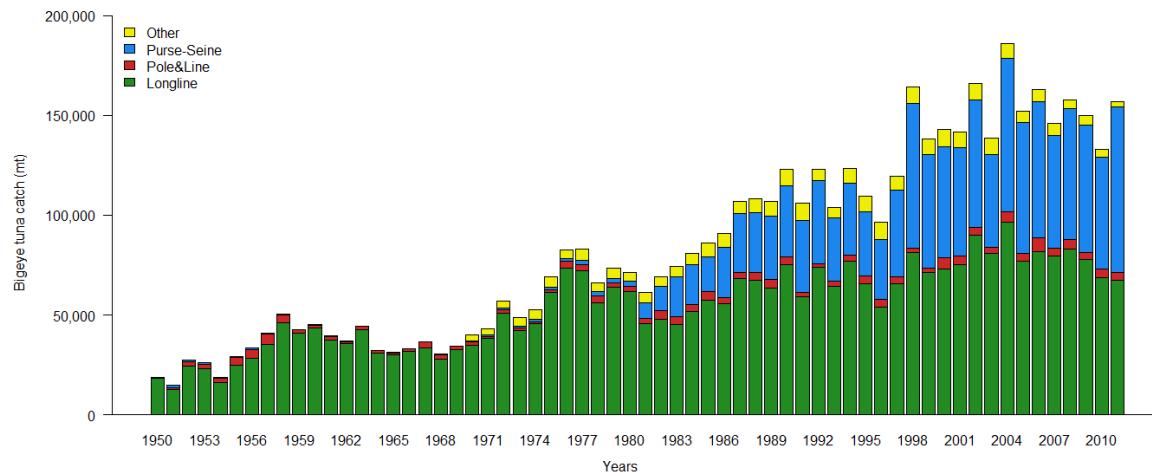
Figure 1 Bigeye tuna catch by gear type and year for WCPFC-Convention Area.
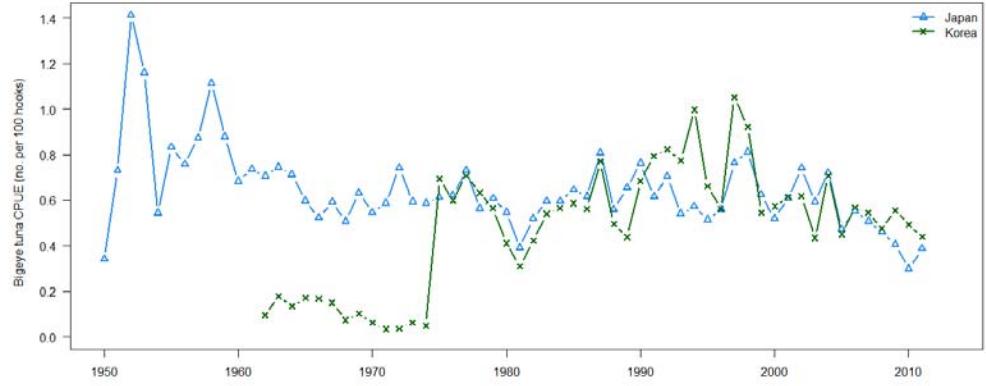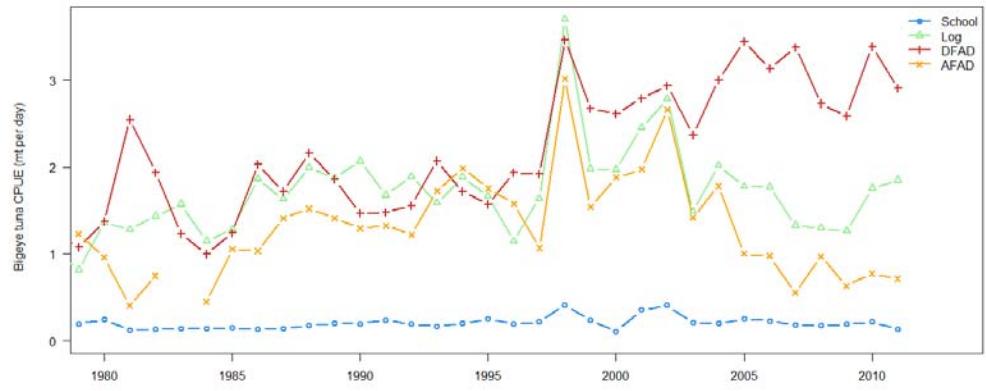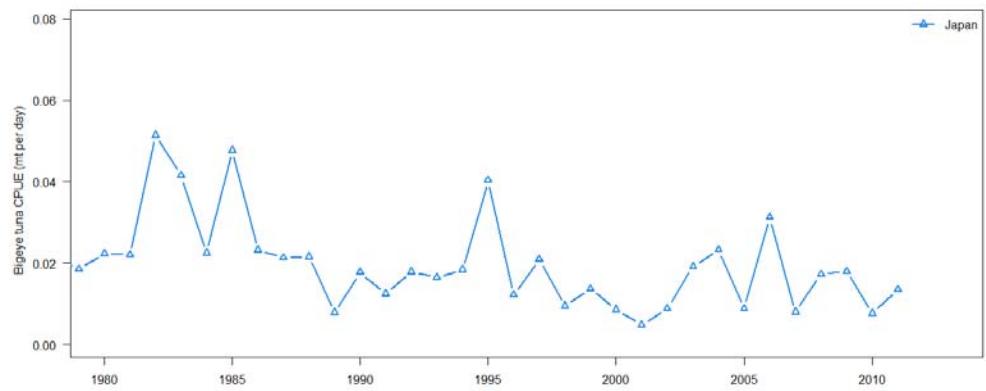
Figure 2 Bigeye tuna catch per unit effort by year for pole and line for the major fishing fleets (top), purse seine for the major set types (middle), and longline for two fleets (bottom).
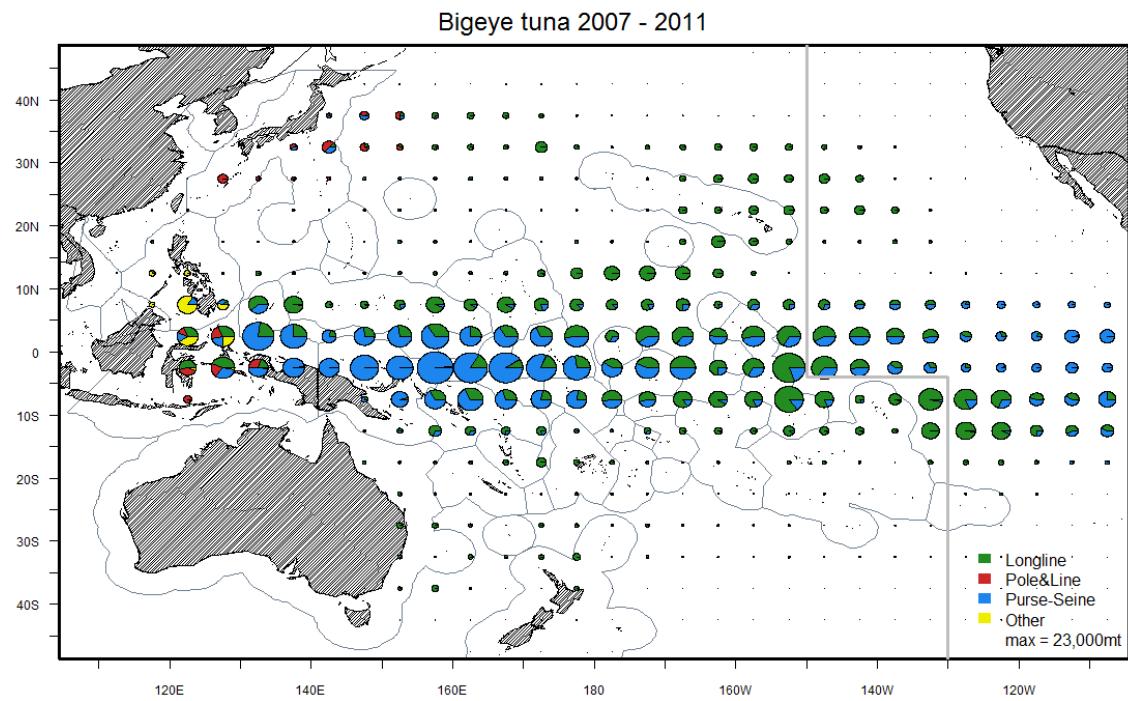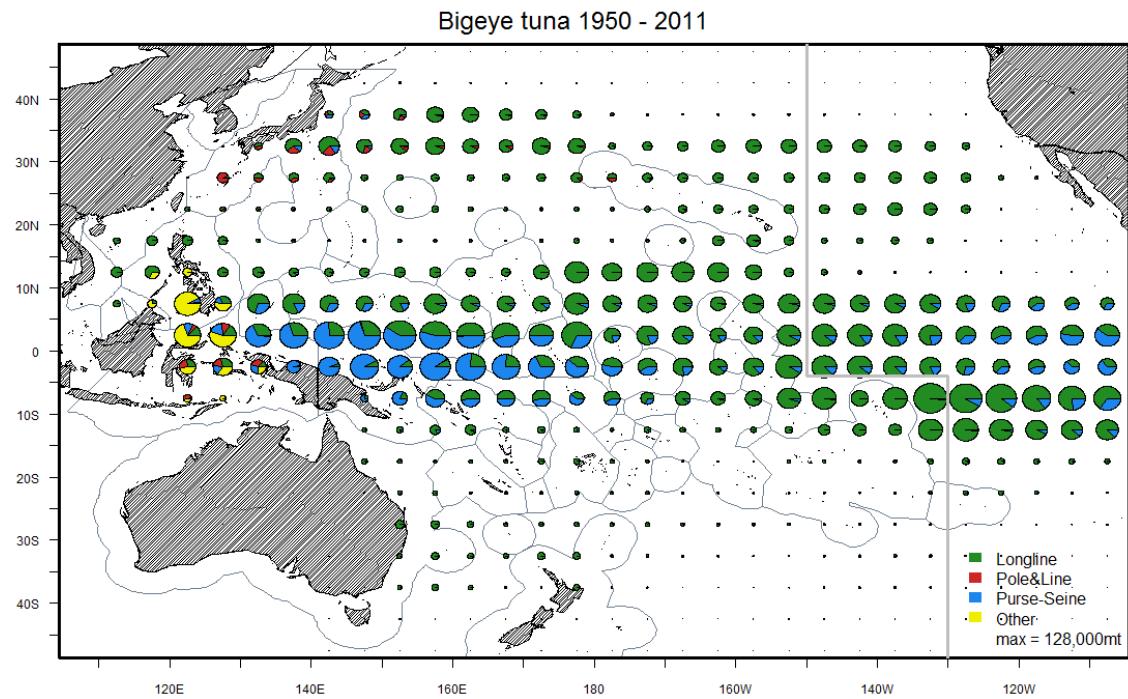
Figure 3 Bigeye tuna catch distribution by gear type and 5x5 degree region for the entire Pacific Ocean for the period 1950-2011 (top) and 2007-2011 (bottom). The maximum circle size is the same for all plots and the figure legend provides the catch associated with this maximum.
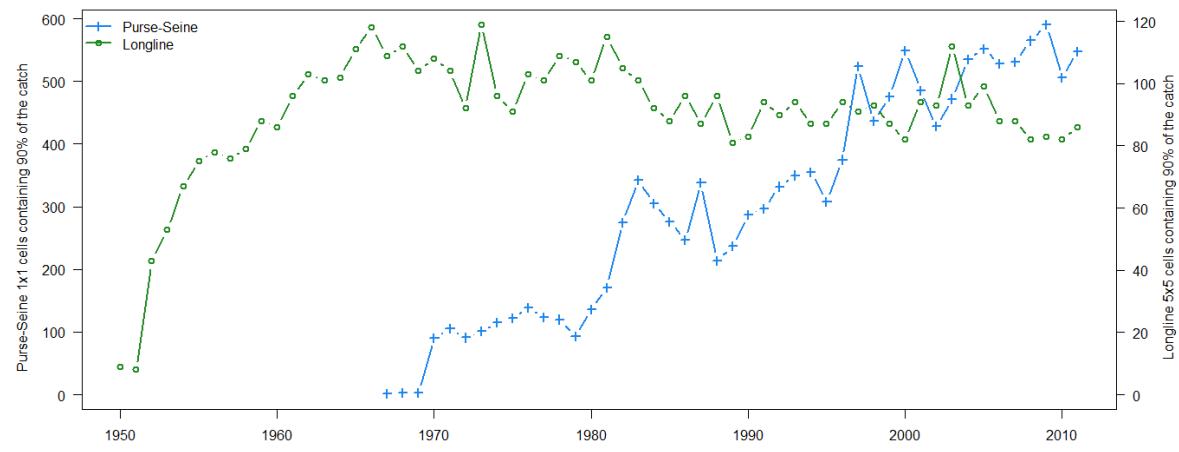
**Figure 4 Concentration of bigeye tuna catches for purse seine and longline by year for the WCPO.**
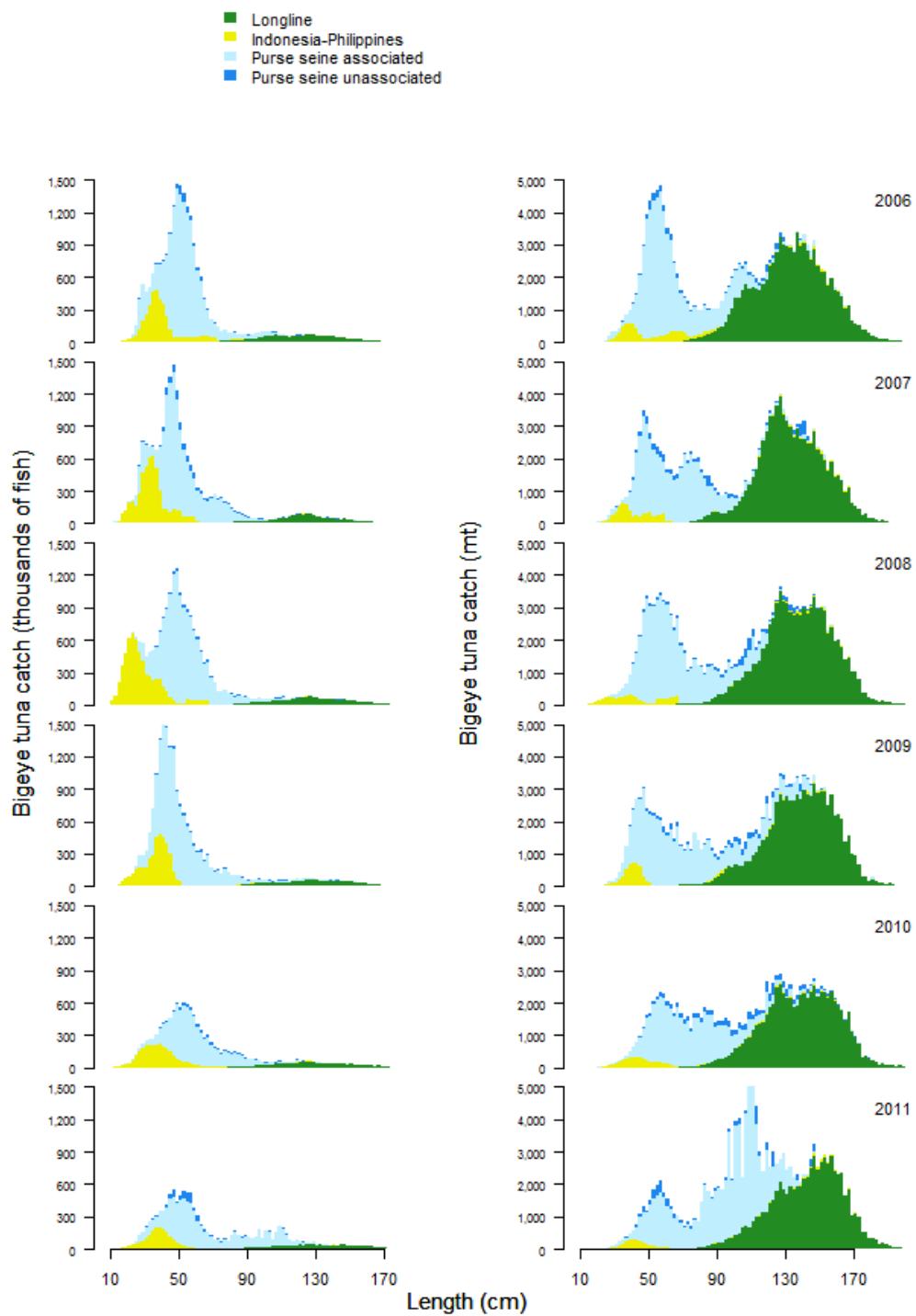
Figure 5 Catch at size of bigeye tuna by gear type and year for the WCPO. Catch is provided in thousands of fish (left) and metric tons (right).
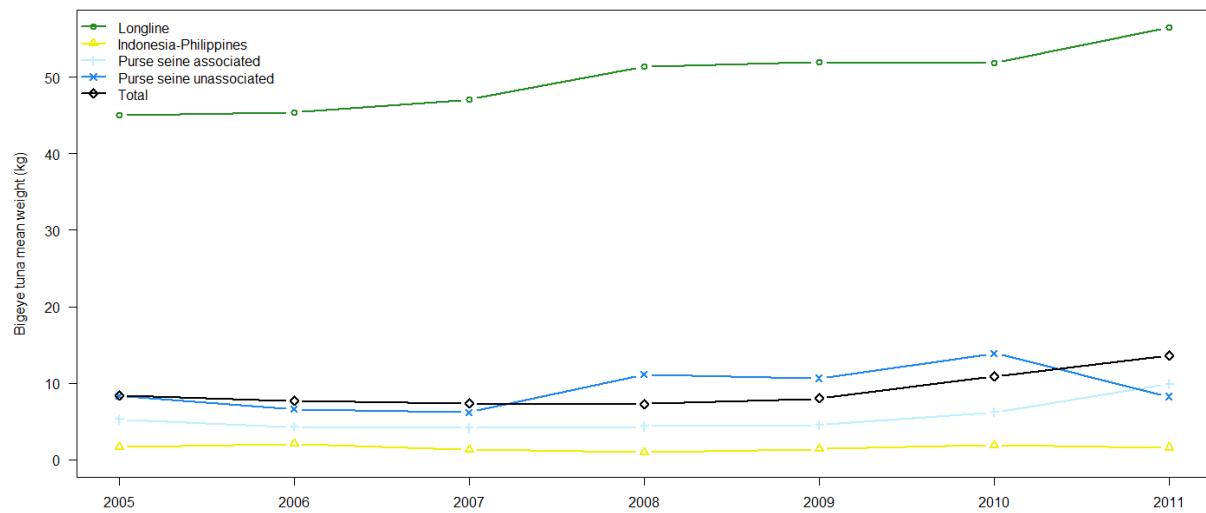
Figure 6 Mean weight of individual bigeye tuna taken by gear and year for the WCPO. The 'total' line represents the overall catch at size.

3.2   SKIPJACK
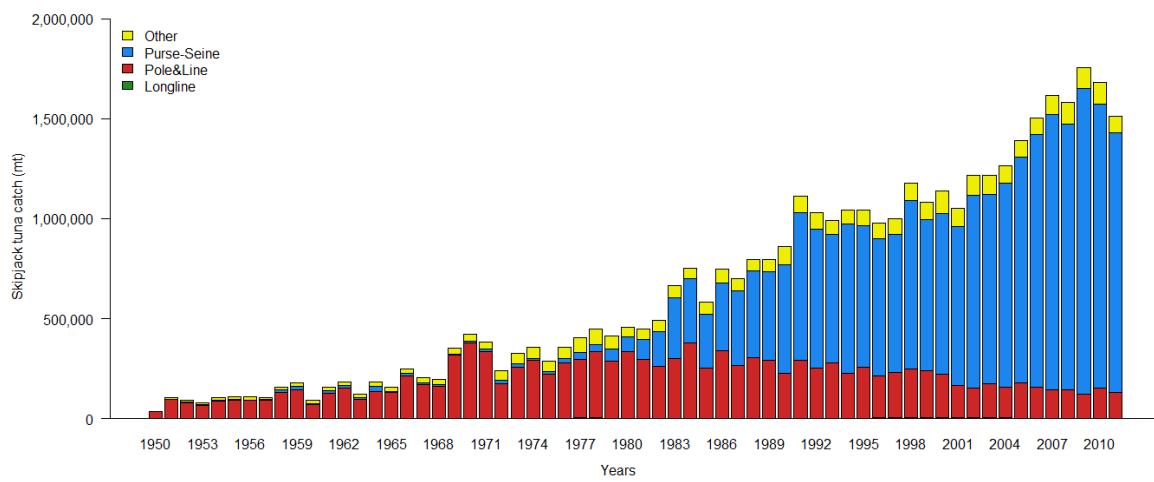
Figure 7 Skipjack tuna catch by gear type and year for WCPFC-Convention Area.
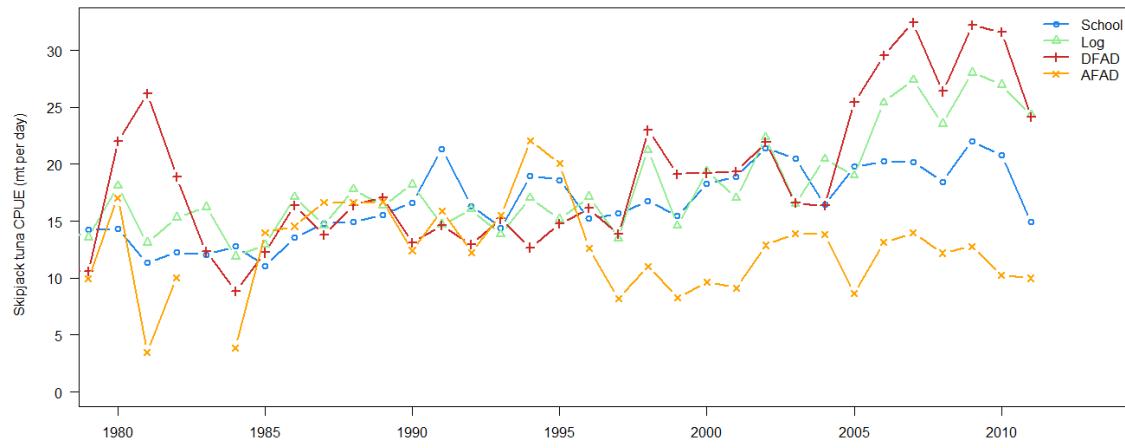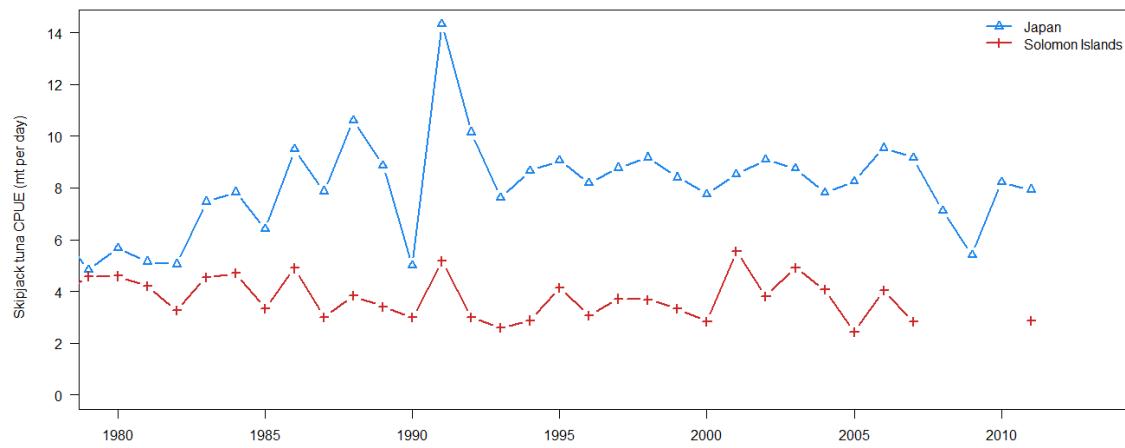
Figure 8 Skipjack tuna catch per unit effort by year for pole and line for two fishing fleets (top) and purse seine for the major set types (bottom).
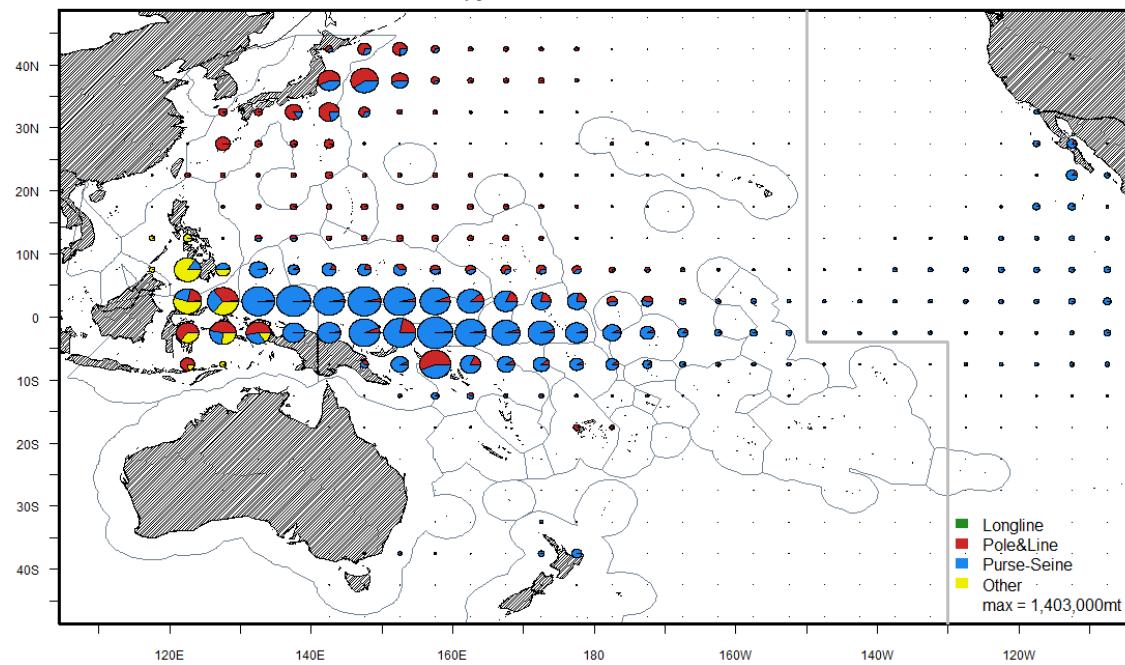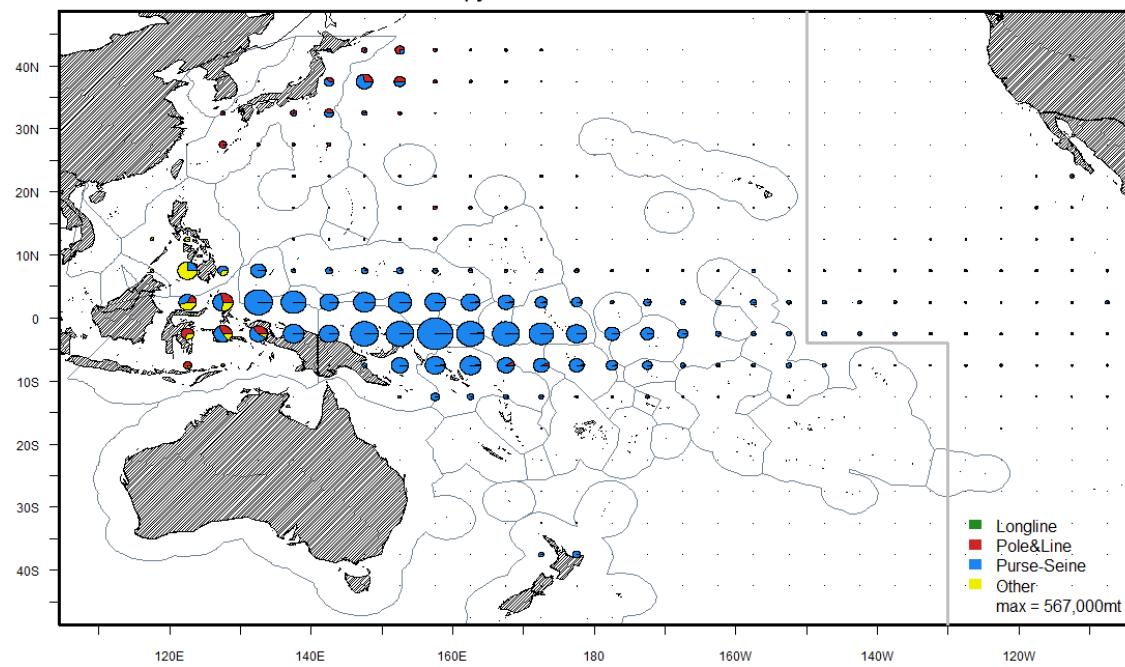
Figure 9 Skipjack tuna catch distribution by gear type and 5x5 degree region for the entire Pacific Ocean for the period 1950-2011 (top) and 2007-2011 (bottom).
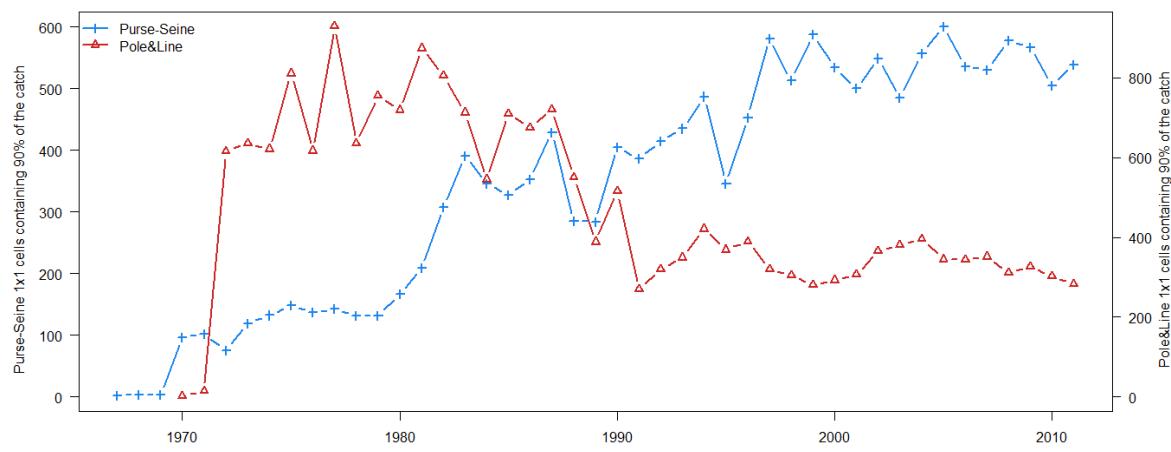
Figure 10 Concentration of skipjack tuna catches for purse seine and pole and line by year for the WCPO.
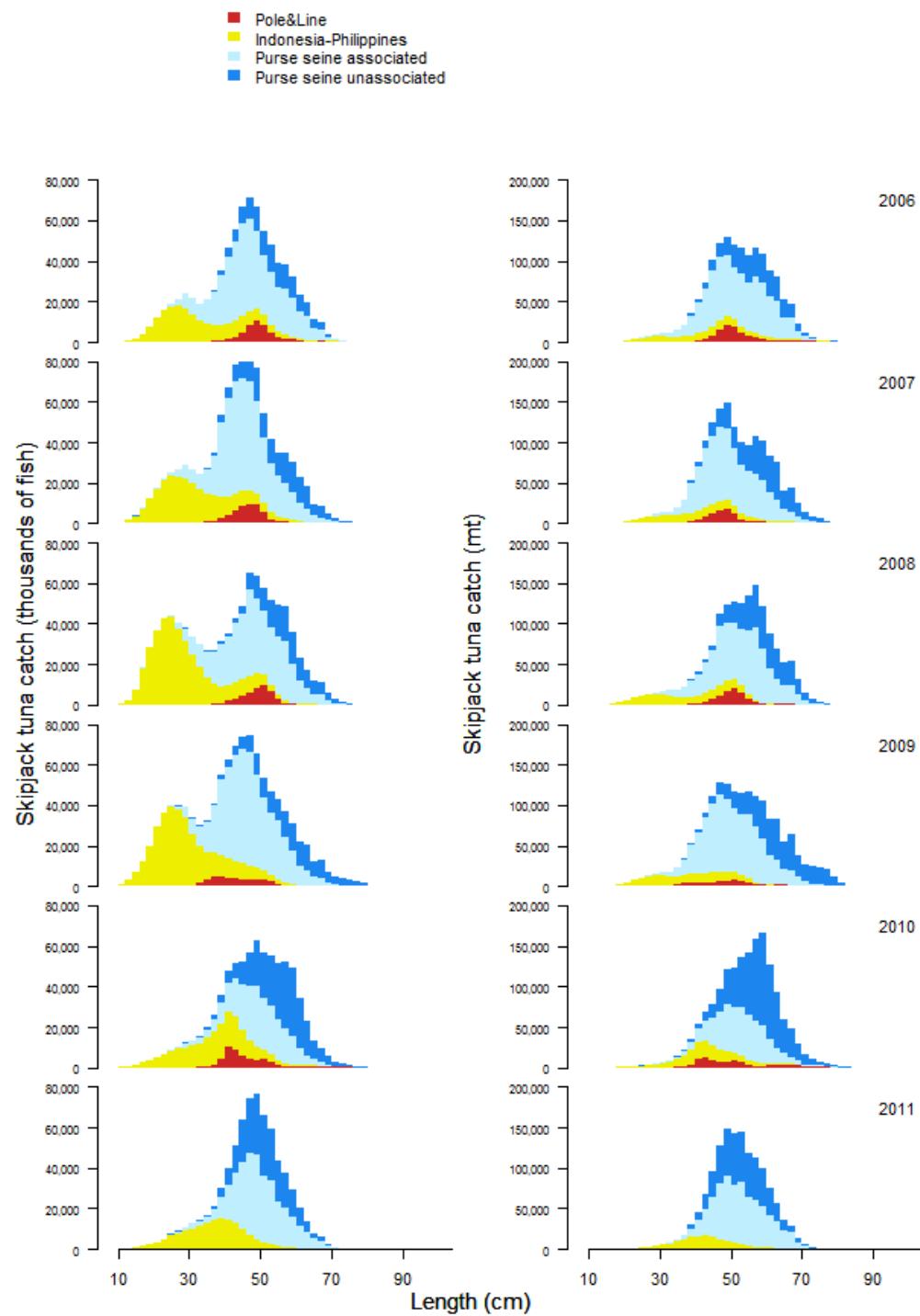
Figure 11 Catch at size of skipjack tuna by gear type and year for the WCPO. Catch is provided in thousands of fish (left) and metric tons (right).
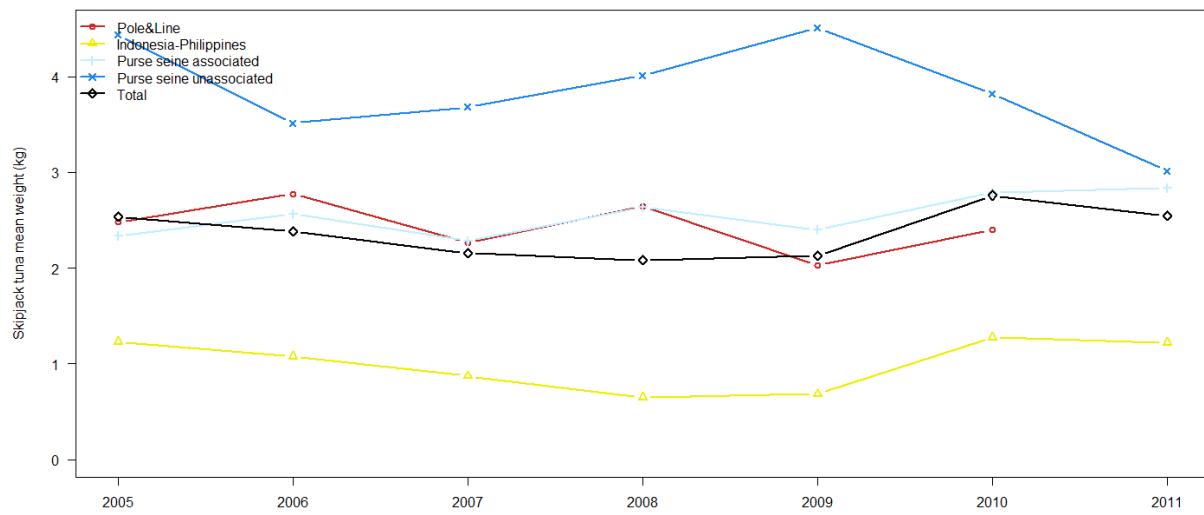
Figure 12 Mean weight of individual skipjack tuna taken by gear and year for the WCPO. The 'total' line represents the overall catch at size.

3.3   YELLOWFIN TUNA
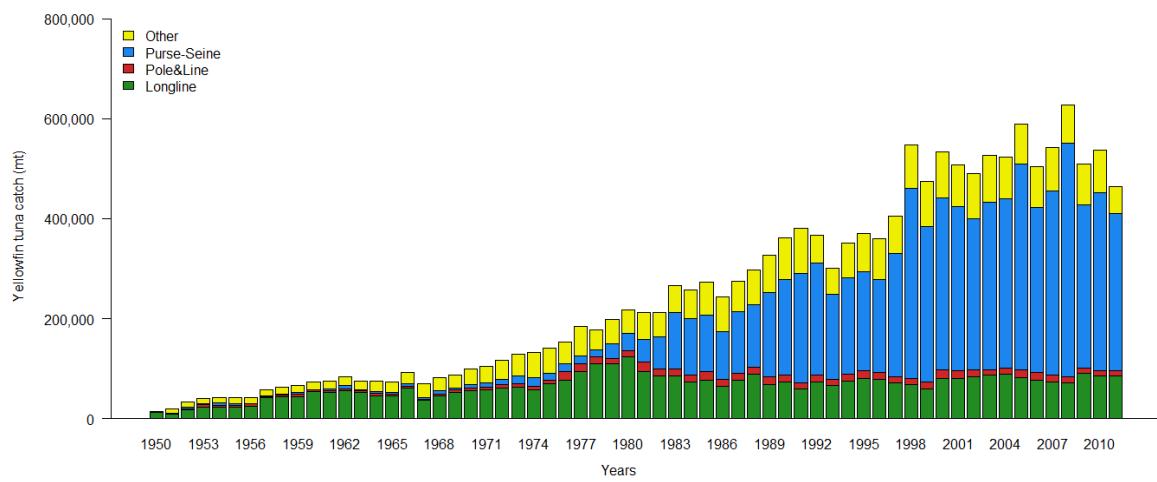
Figure 13 Yellowfin tuna catch by gear type and year for WCPFC-Convention Area.
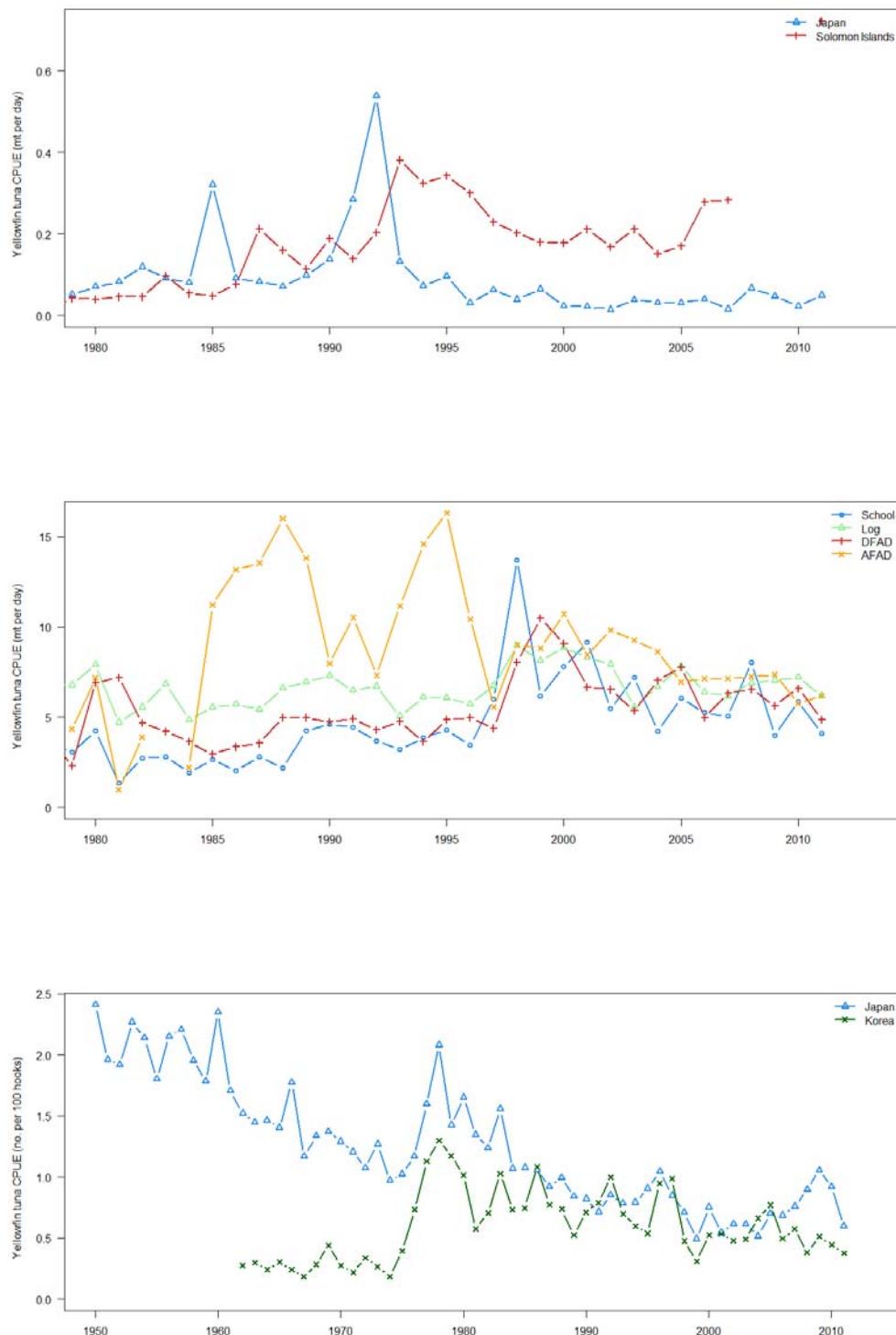
Figure 14 Yellowfin tuna catch per unit effort by year for pole and line for two fleets (top), purse seine for the major set types (middle), and longline for two fleets (bottom).
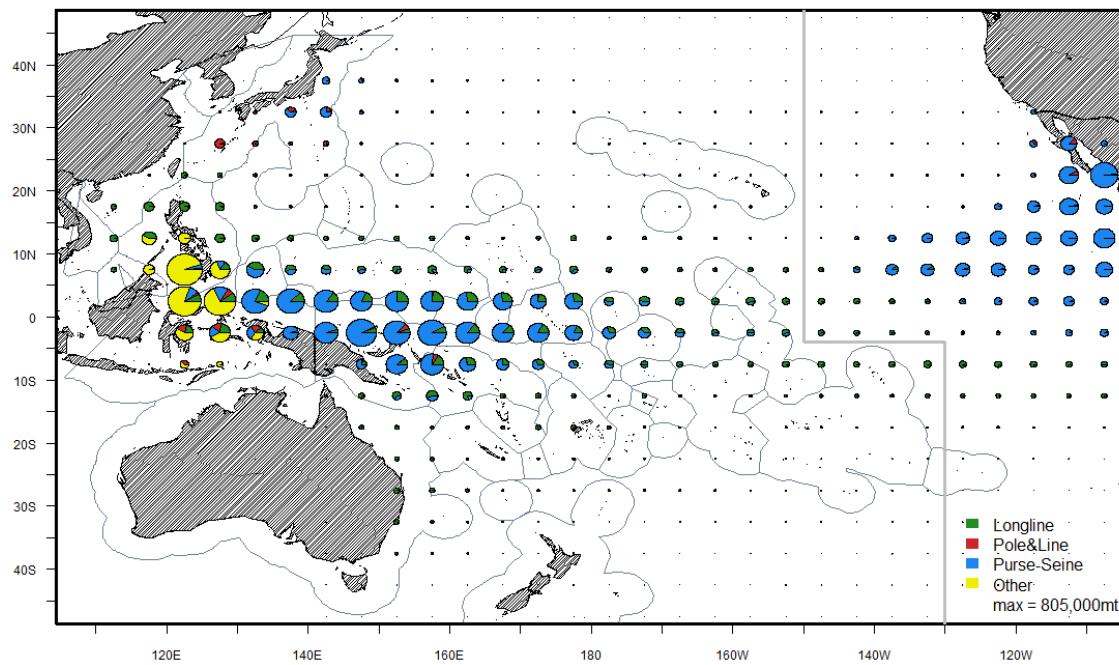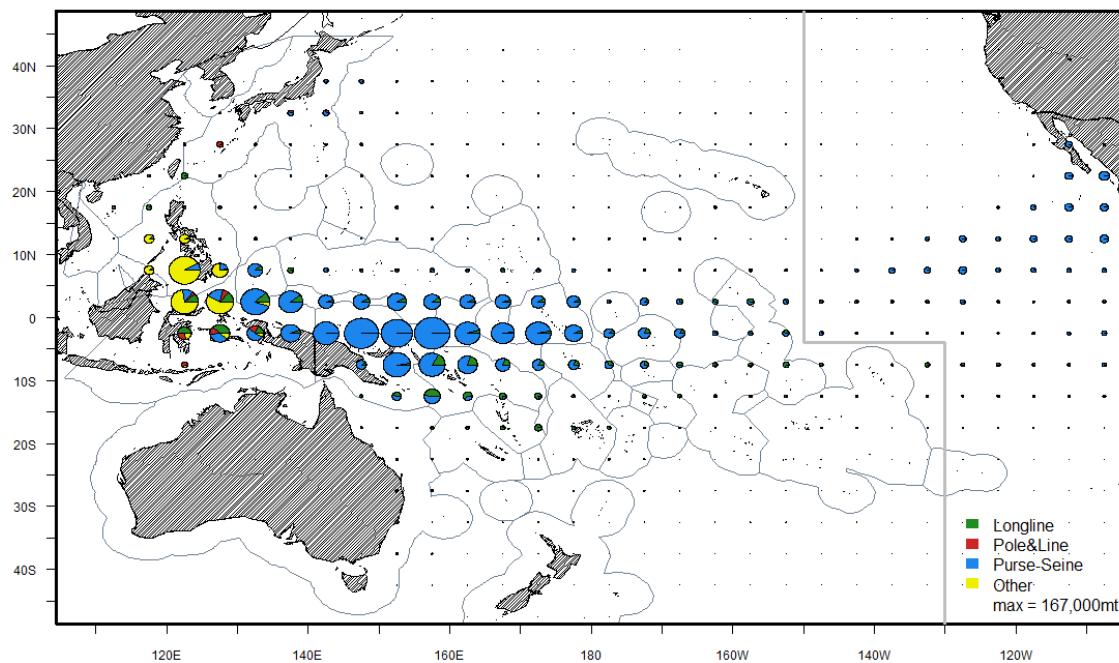
Figure 15 Yellowfin tuna catch distribution by gear type and 5x5 degree region for the entire Pacific Ocean for the period 1950-2011 (top) and 2007-2011 (bottom).
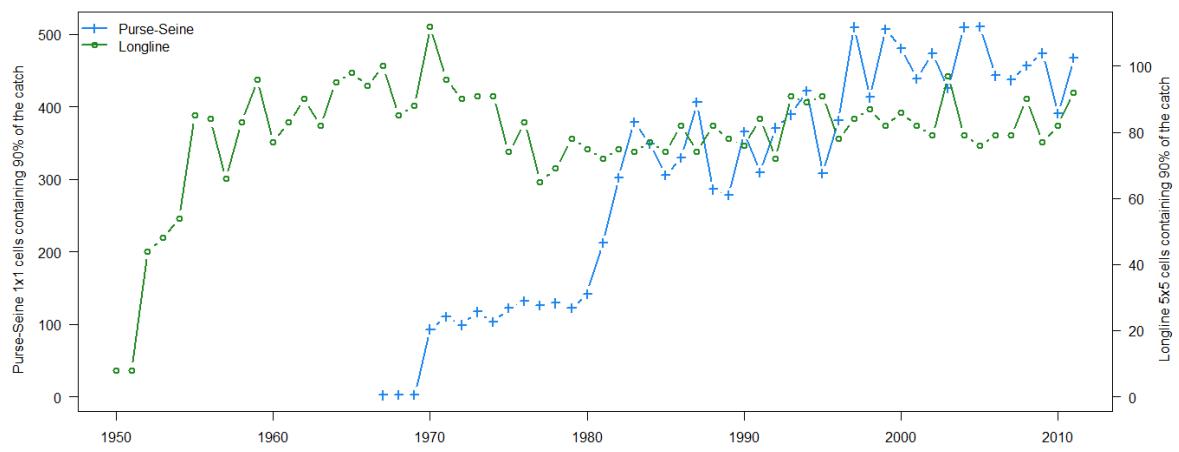
**Figure 16 Concentration of yellowfin tuna catches for purse seine and pole and line by year for the WCPO.**
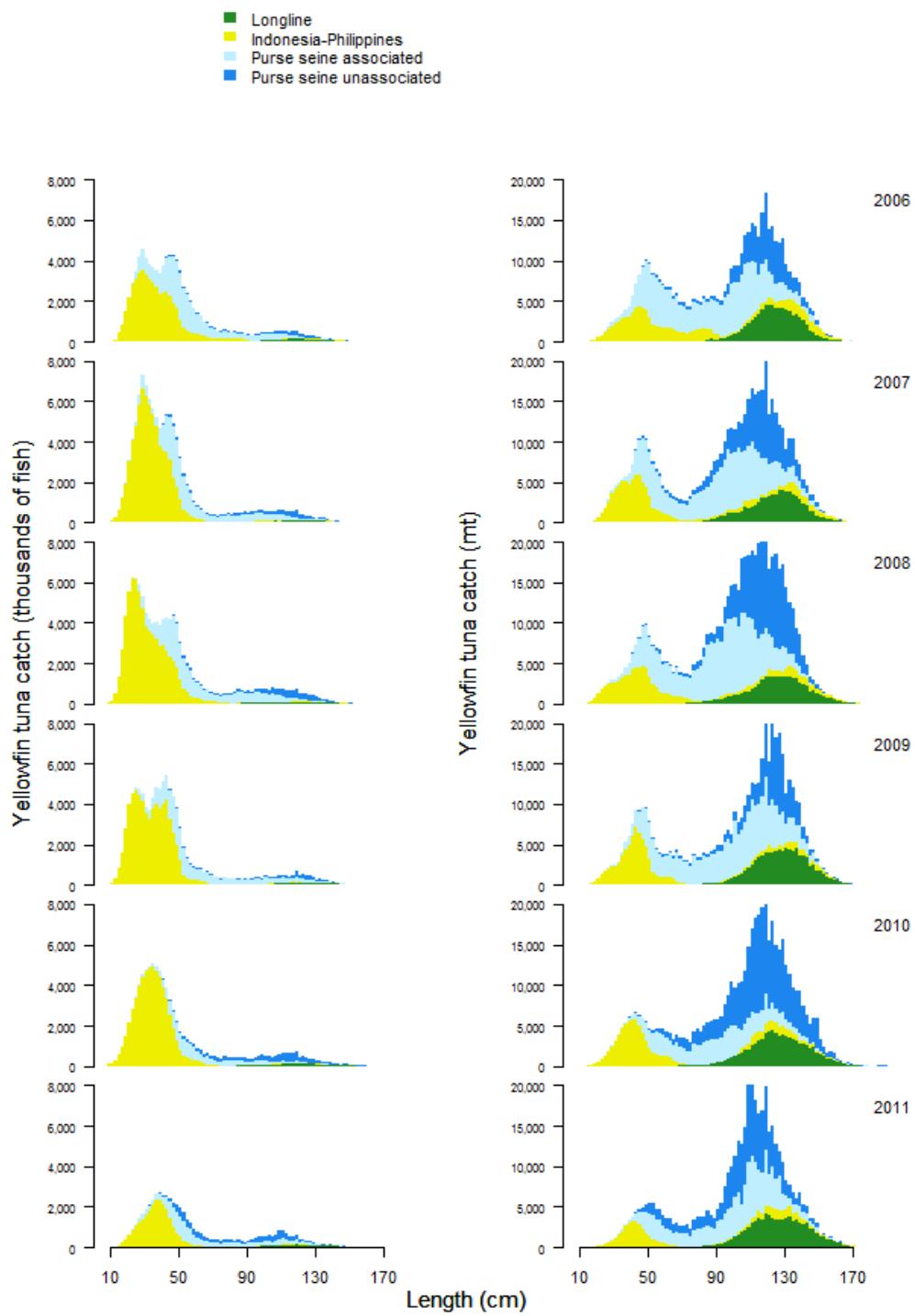
Figure 17 Catch at size of yellowfin tuna by gear type and year for the WCPO. Catch is provided in thousands of fish (left) and metric tons (right).
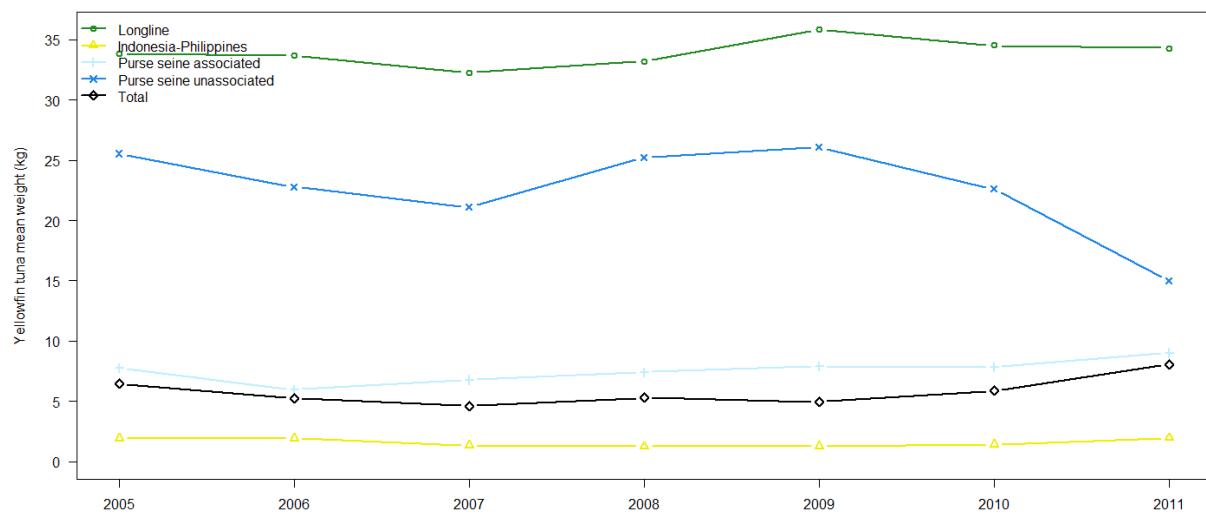
Figure 18 Mean weight of individual yellowfin tuna taken by gear and year for the WCPO. The 'total' line represents the overall catch at size.

3.4   ALBACORE (WITH A SOUTH PACIFIC EMPHASIS)
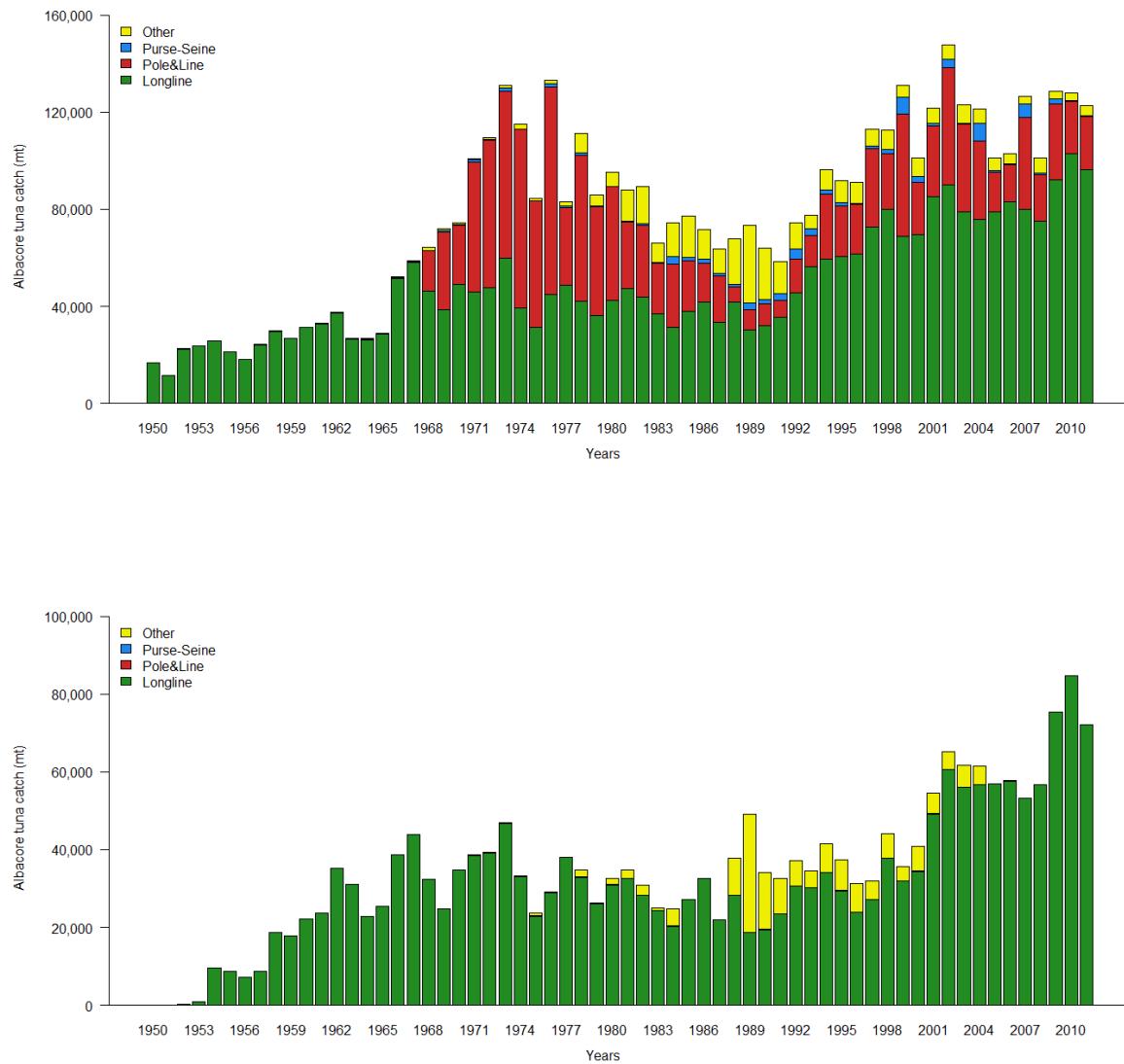
Figure 19 Albacore tuna catch by gear type and year for WCPFC-Convention Area (top) and south Pacific Ocean (bottom).
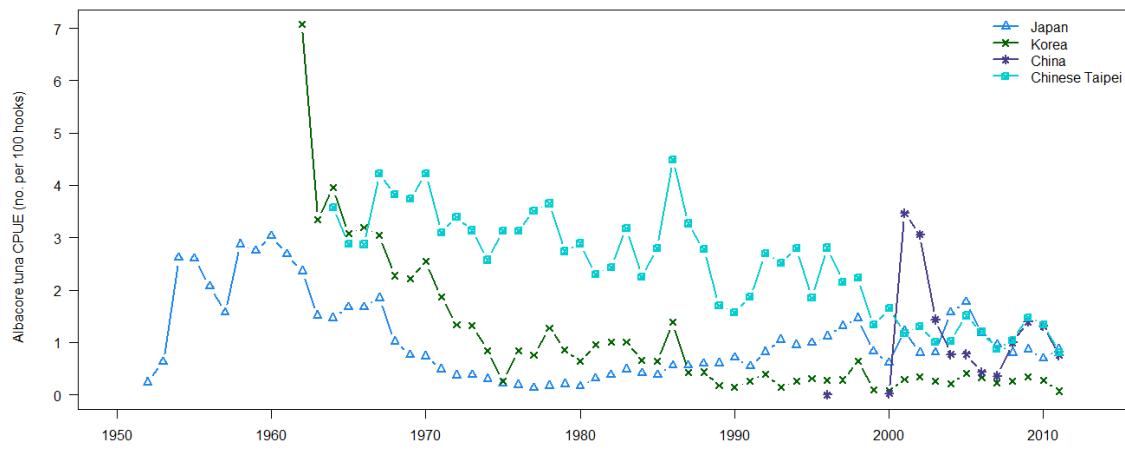
Figure 20 Albacore tuna in the south Pacific Ocean catch per unit effort by year for several fleets.
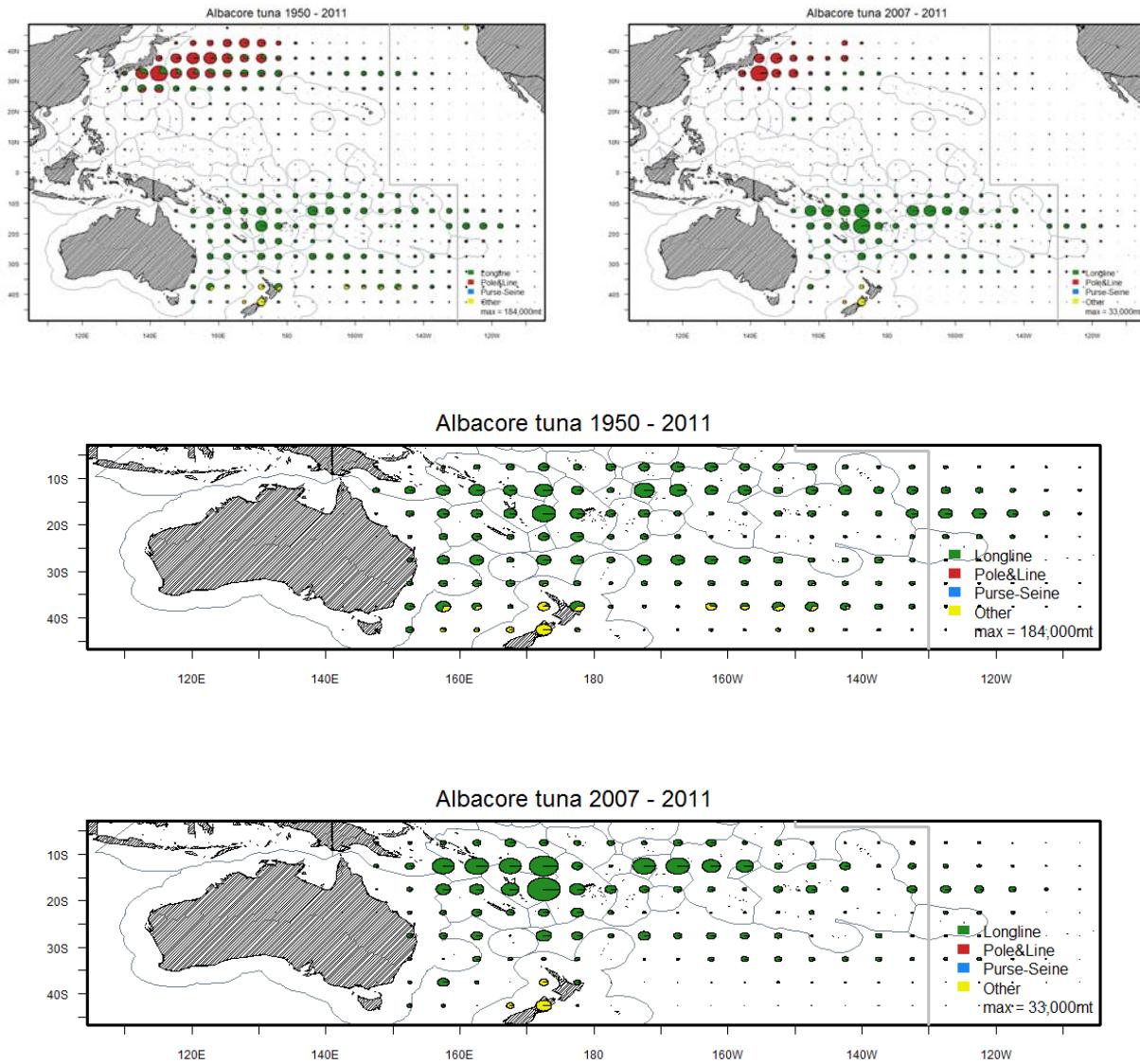
Figure 21 Albacore tuna catch distribution by gear type and 5x5 degree region for the entire Pacific Ocean for the period 1950-2011 (top left) and 2007-2011 (top right) and for the south Pacific ocean for the period 1950-2011 (middle) and 2007-2011 (bottom) .
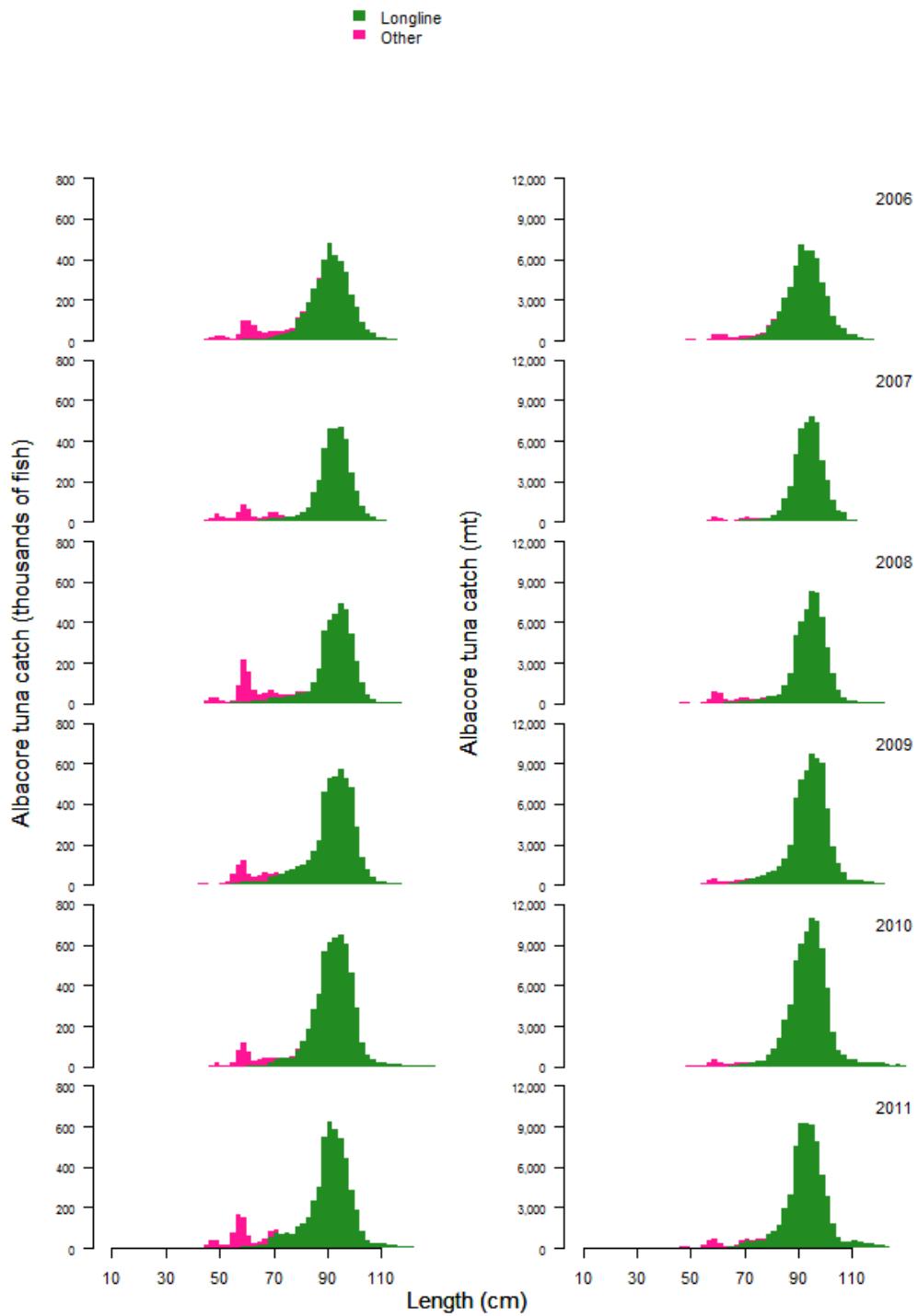
Figure 22 Catch at size of albacore tuna in the south Pacific Ocean by gear type and year. Catch is provided in thousands of fish (left) and metric tons (right).
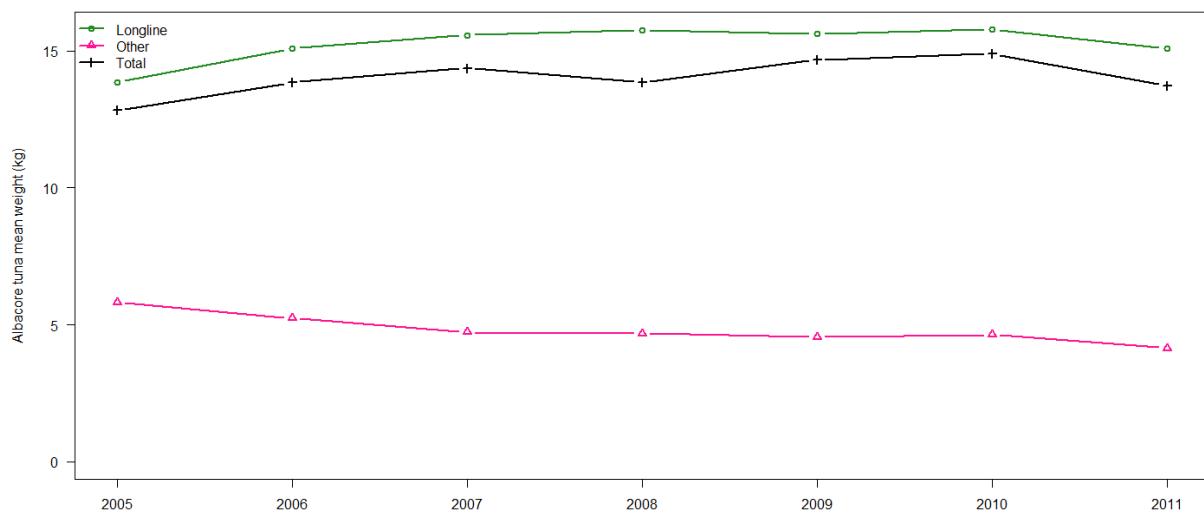
Figure 23 Mean weight of individual albacore tuna in the south Pacific Ocean taken by gear and year. The 'total' line represents the overall catch at size.

## 3.5   SWORDFISH (WITH A SOUTH PACIFIC EMPHASIS)
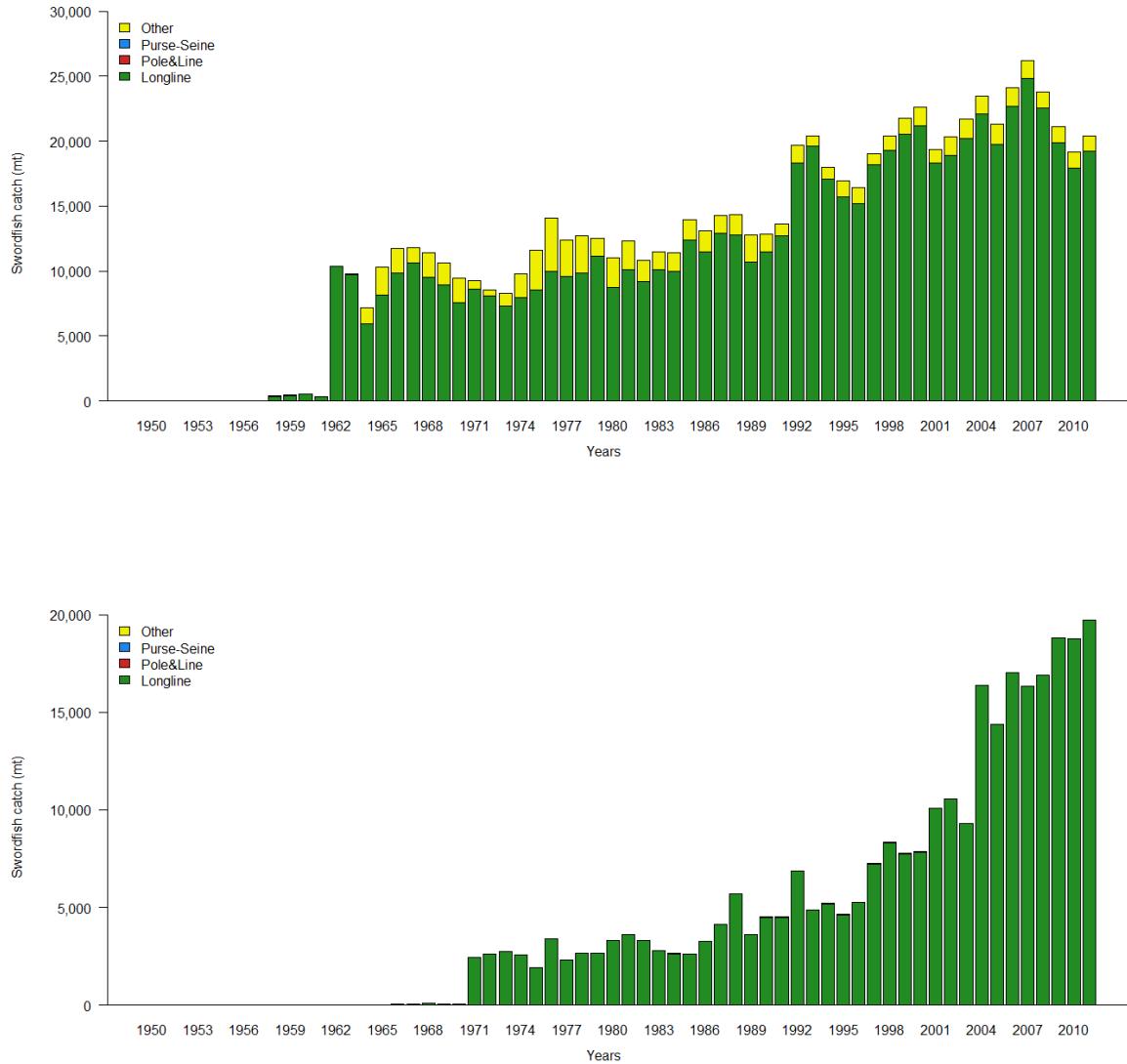
Figure 24 Swordfish catch by gear type and year for WCPFC-Convention Area (top) and south Pacific Ocean (bottom).
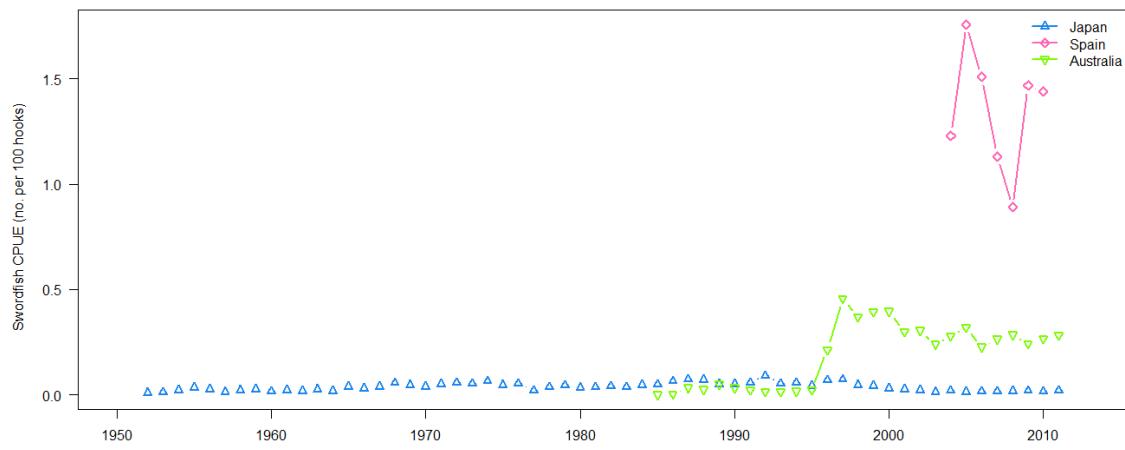
**Figure 25 Swordfish catch per unit effort by year longline for several fleets.**
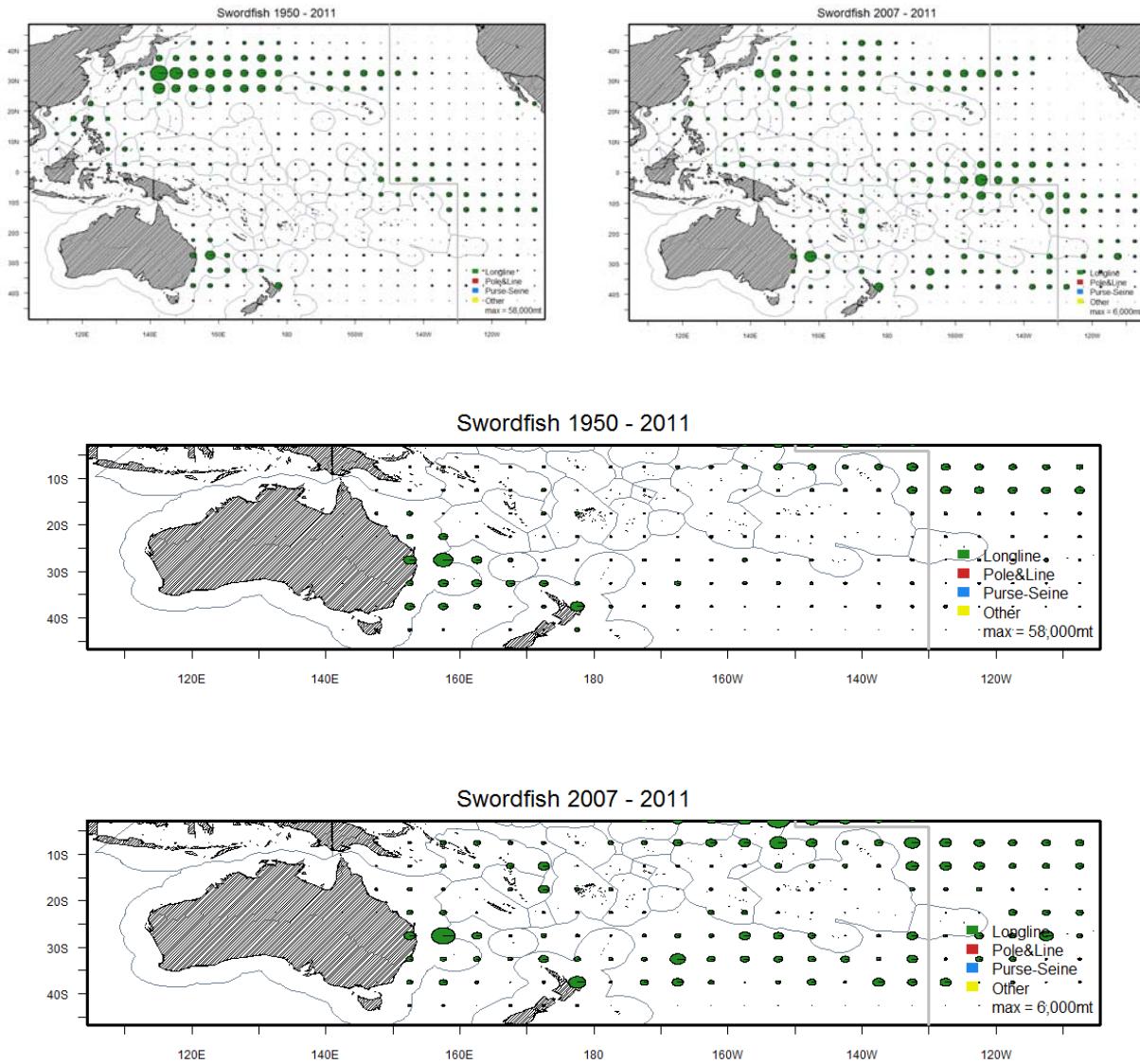
Figure 26 Swordfish catch distribution by gear type and 5x5 degree region for the entire Pacific Ocean for the period 1950-2011 (top left) and 2007-2011 (top right) and for the south Pacific ocean for the period 1950-2011 (middle) and 2007-2011 (bottom).
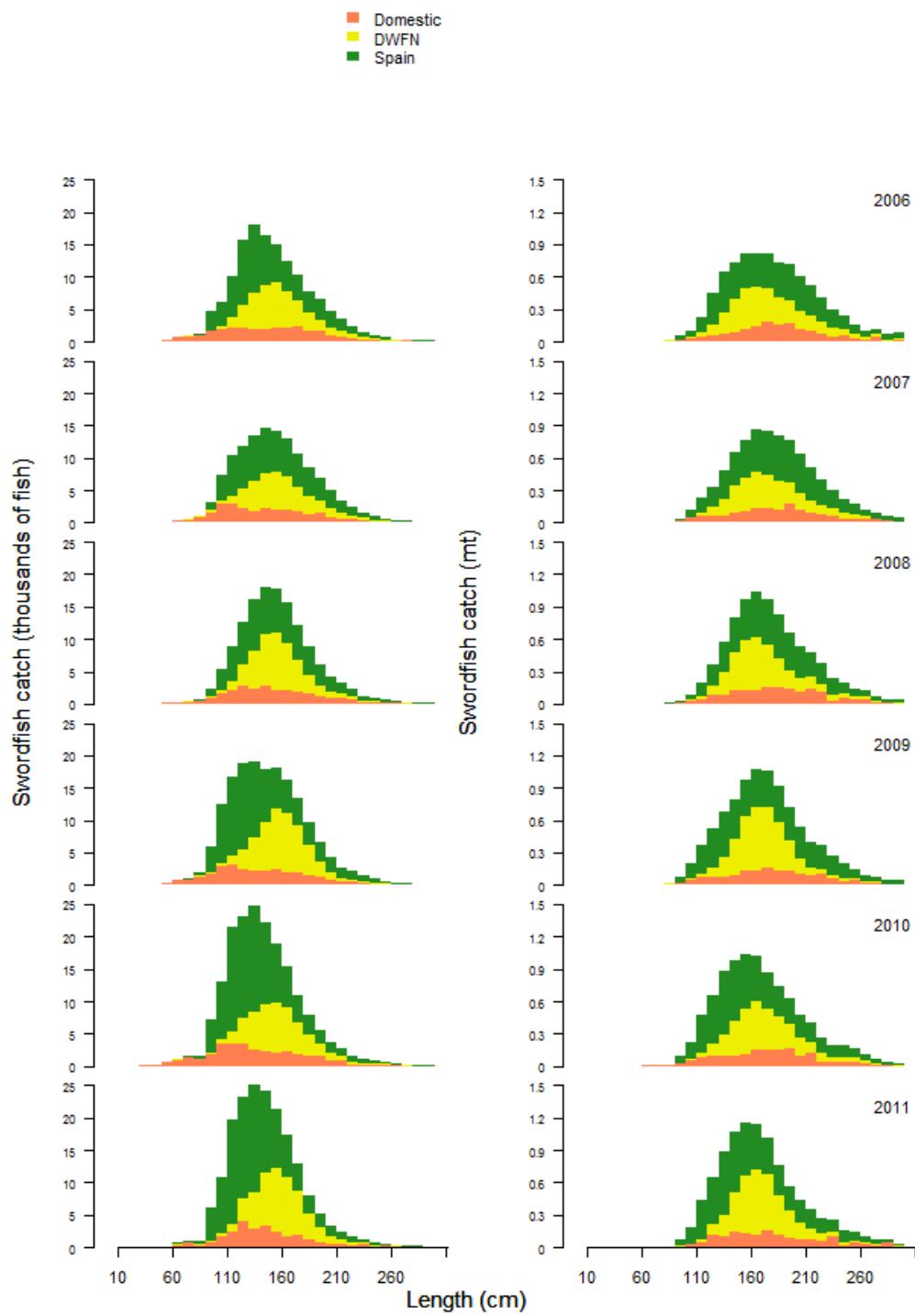
Figure 27 Catch at size of swordfish in the south Pacific Ocean by longline for major fleet groups. Catch is provided in thousands of fish (left) and metric tons (right).
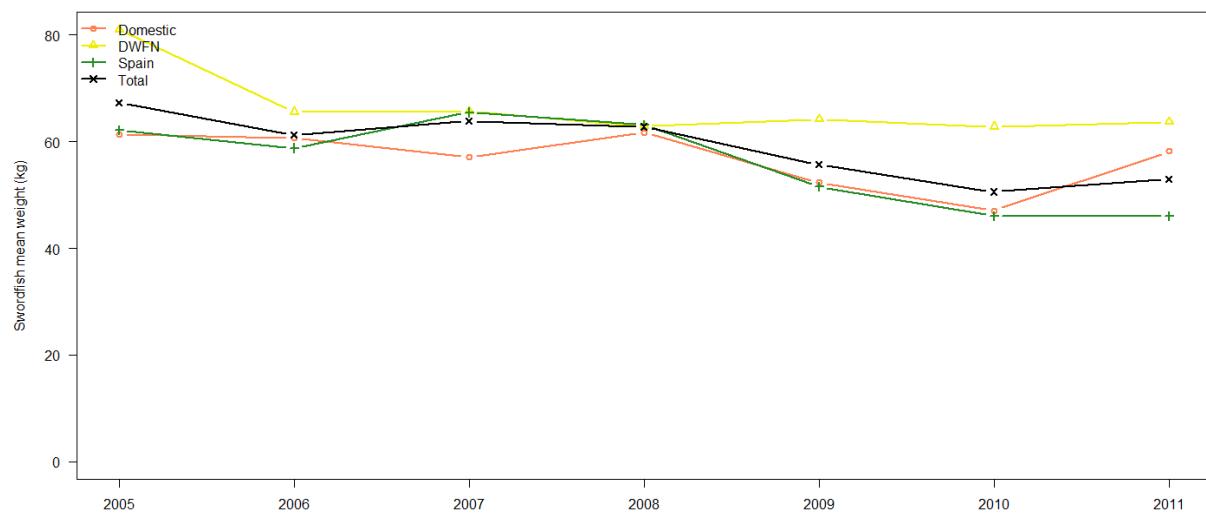
Figure 28 Mean weight of individual swordfish taken by some major fleets in the South Pacific Ocean for the period 2004-2010. The 'total' line represents the overall catch at size.