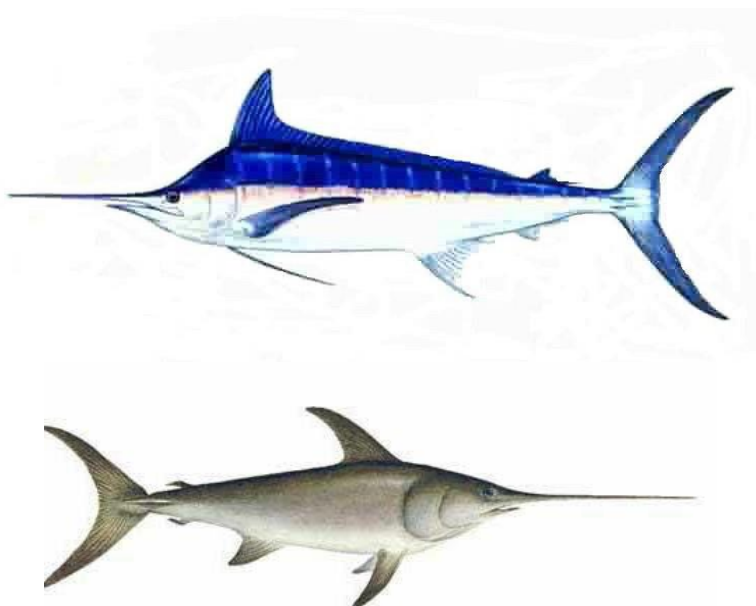




**Spatial Distribution of Striped Marlin Catches in the North Pacific from  
WCPFC Data<sup>1</sup>**

Darryl T. Tagami  
NOAA NMFS Pacific Islands Fisheries Science Center  
Honolulu, Hawaii, USA

Haiying Wang  
Joint Institute for Marine and Atmospheric  
Research Corporation of University of Hawaii  
Honolulu, Hawaii, USA



<sup>1</sup>Working document submitted to the ISC Billfish Working Group Workshop, 13-20 January 2015, Honolulu, Hawaii, USA. Document not to be cited without author's written permission.

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Darryl T. Tagami  
Pacific Islands Fisheries Science Center  
National Marine Fisheries Service, NOAA  
Honolulu, Hawaii 96818 U.S.A.

Haiying Wang  
University of Hawaii  
Joint Institute for Marine and Atmospheric Research  
Honolulu, Hawaii 96818 U.S.A.

## **Abstract**

This working paper presents catch summaries and plots of the distribution of effort and catches of striped marlin in the North Pacific using data from non-ISC member countries. The objective of this working paper is to provide the ISC Billfish Working Group with billfish catch data not available in the ISC or ISC Working Groups data holdings. The data was provided by the WCPFC for longline catches of striped marlin only. This information represents an update of the striped marlin catch data that was provided by the WCPFC for the ISC stock assessment in 2011.

## Introduction

The Western and Central Pacific Fisheries Commission (WCPFC) was established in June 2004 by the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC Convention). The WCPFC has 26 member countries, seven Participating Territories, and eight Cooperating Non-Members.

Japan, Chinese Taipei, Korea, and U.S.A. are member countries of both the ISC and the WCPFC. Many other WCPFC member countries fish in the North Pacific but are not members of the ISC.

## Methods

The WCPFC provided historical longline catch data for striped marlin (*Kajikia audax*) in the North Pacific Ocean to the ISC Billfish Working Group. These Category I data consist of cumulative catches (MT), total years, and average catch per year by country. Note that the WCPFC data are from north of the Equator and west of the 150° W longitude.

The WCPFC also provided historical Category II data, consisting of catch and effort data aggregated annually by 5-degree squares for member countries. The Category II data are plotted by 5-degree squares for the top 7 countries (Japan, Chinese Taipei, Korea, USA, China, Vanuatu, and Federated States of Micronesia) for the most recent 6-year period (2008-2013). This spans the 2010-2013 period of particular interest for the 2015 stock assessment update.

The WCPFC also provided Category III data, consisting of size frequency data aggregated by 5-degree squares and years. These data will be summarized and presented in a separate working paper by another member of the Billfish Working Group.

## Results

Striped marlin longline cumulative catches in weight (MT) from WCPFC data for the North Pacific Ocean, representing Category I data, were summed for all years of fishing by country (Table 1). WCPFC catches for both non-ISC member countries and ISC member countries (Japan, Chinese Taipei, Korea, and the U.S.A.) are presented for comparison.

The total catch of striped marlin for ISC members for all years of the WCPFC longline data is 205,138 metric tons. Japanese catches represented the preponderance (over 83%) of this total, with most of the remainder caught by Chinese Taipei (9%) and the U.S.A. (6%). Japan reported peak catches in 1971 (11,632 MT), and 1993 (8,684 MT), but annual catch totals have been less than 4000 mt since 1996. Catches by Chinese Taipei ranged from 300 to 1000 MT during 1958-1988, but have remained below 300 MT since.

The total catch of striped marlin by non-ISC members for all years of the WCPFC longline data is 2,991 MT. Most of the total was from China (57%), the Philippines (26%), and Vanuatu (14%). The remaining 3% of the total catch is shared among the other WCPFC member countries. During 2008-2013, China generally produced annual catches from 100-900 MT.

#### Distributions of Striped Marlin Longline Catches

The distributions of longline catches and effort by the seven countries with the largest striped marlin catches (Japan, Chinese Taipei, Korea, U.S.A., China, Vanuatu, and the Federated States of Micronesia) are presented in Figures 1-7. Results are depicted in 5-degree squares and represent Category II data.

Chinese Taipei (Figure 3) and Japan (Figure 4) had substantial effort and catches across broad expanses of the North Pacific during 2008-2013. Korea (Figure 2) and China (Figure 5) fished throughout the western and central Pacific Ocean but had some substantial catches primarily in near-equatorial waters. The U.S.A. catch was concentrated near Hawaii (Figure 1) in the central Pacific Ocean. Of the non-ISC member countries, Vanuatu (WCPFC member) fished across the western and central North Pacific Ocean. The Federated States of Micronesia fished primarily in near-equatorial waters of the central North Pacific Ocean.

It must be recognized that the two data categories differ in scope. Category I data provide the best estimates for annual catches by gear types for the reporting countries. Category II catches are generally a subset of the Category I catches, but the Category II data does provide information on the spatial distributions of catches and effort by gears for the reporting countries.

## REFERENCES

Tagami, Darryl.

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ISC/11/BILLWG-2/01.

Yau, Annie, and Yi-Jay Chang.

2015. Summary of Striped Marlin Catch and Size Data from the Western and  
Central Pacific Fisheries Commission. ISC/15/BILLWG-1/05.

## **Figure Legends**

Figure 1. Distributions of striped marlin longline catches and effort in the North Pacific by the U.S.A. during 2008-2013. Catch totals are expressed in numbers of fish caught; effort is expressed in thousands of hooks.

Figure 2. Distributions of striped marlin longline catches and effort in the North Pacific by Korea during 2008-2013. Catch totals are expressed in numbers of fish caught; effort is expressed in thousands of hooks.

Figure 3. Distributions of striped marlin longline catches and effort in the North Pacific by Chinese Taipei during 2008-2013. Catch totals are expressed in numbers of fish caught; effort is expressed in thousands of hooks.

Figure 4. Distributions of striped marlin longline catches and effort in the North Pacific by Japan during 2008-2013. Catch totals are expressed in numbers of fish caught; effort is expressed in thousands of hooks.

Figure 5. Distributions of striped marlin longline catches and effort in the North Pacific by China during 2008-2013. Catch totals are expressed in numbers of fish caught; effort is expressed in thousands of hooks.

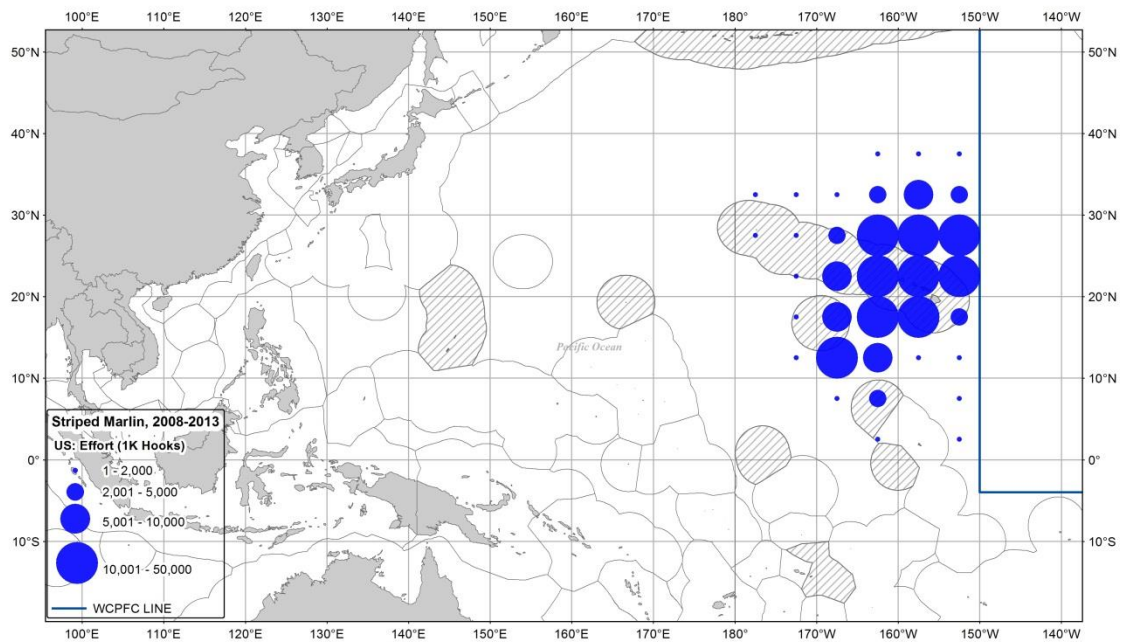
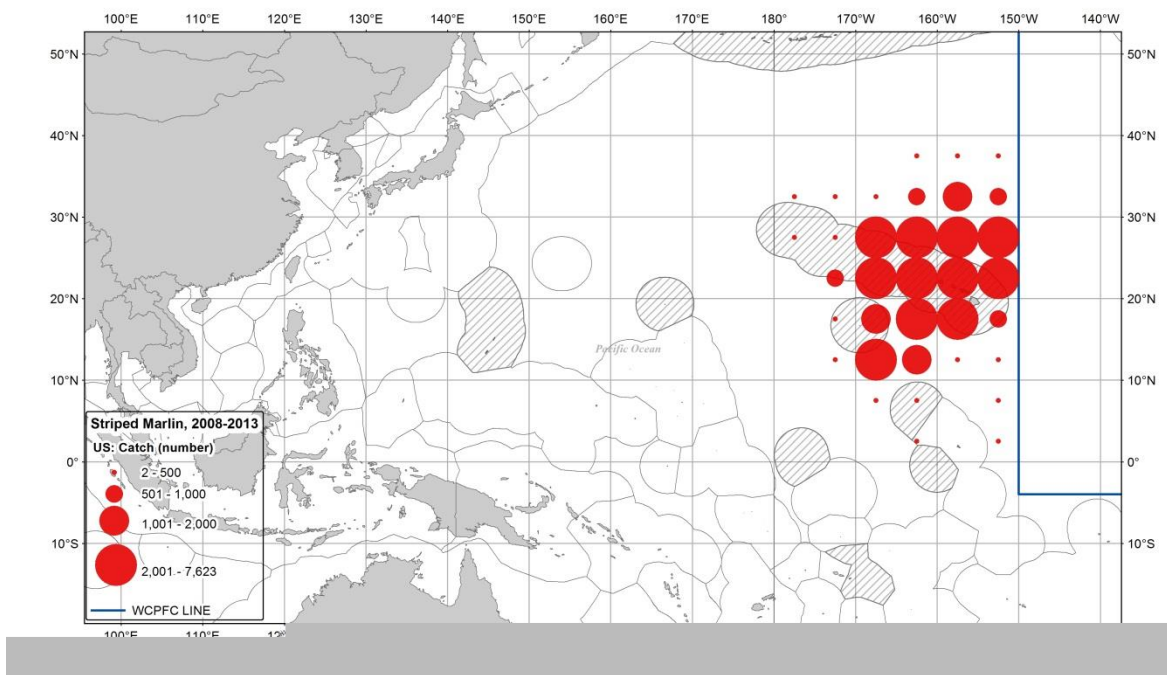
Figure 6. Distributions of striped marlin longline catches and effort in the North Pacific by Vanuatu during 2008-2013. Catch totals are expressed in numbers of fish caught; effort is expressed in thousands of hooks.

Figure 7. Distributions of striped marlin longline catches and effort in the North Pacific by The Federated States of Micronesia during 2008-2013. Catch totals are expressed in numbers of fish caught; effort is expressed in thousands of hooks.

**Table 1 – Striped marlin longline cumulative catches (MT) by country from WCPFC database.**

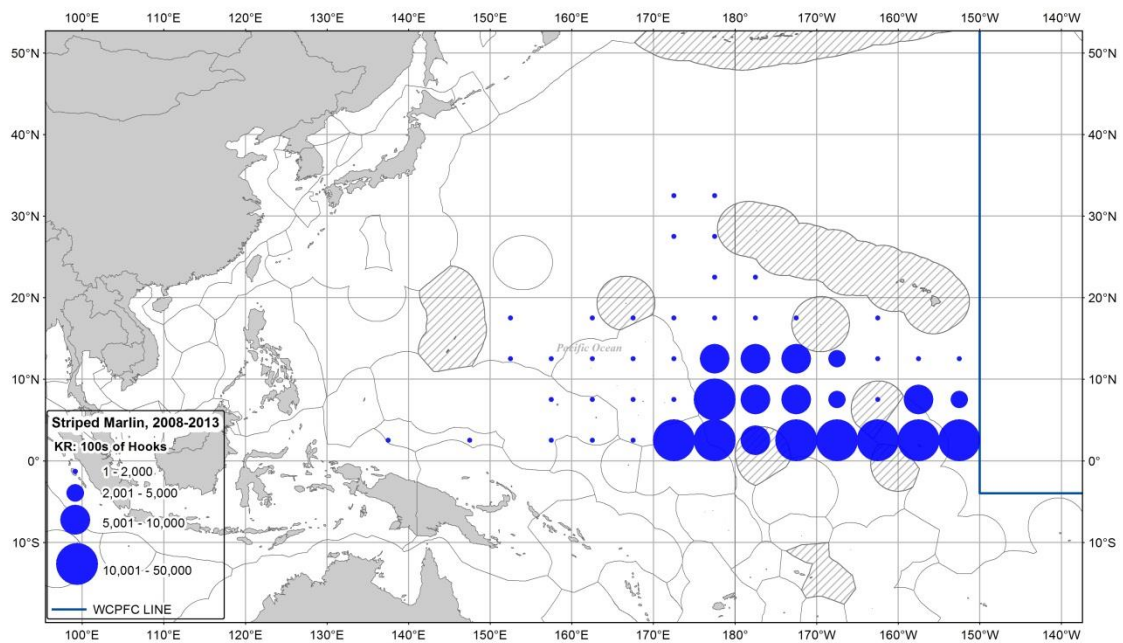
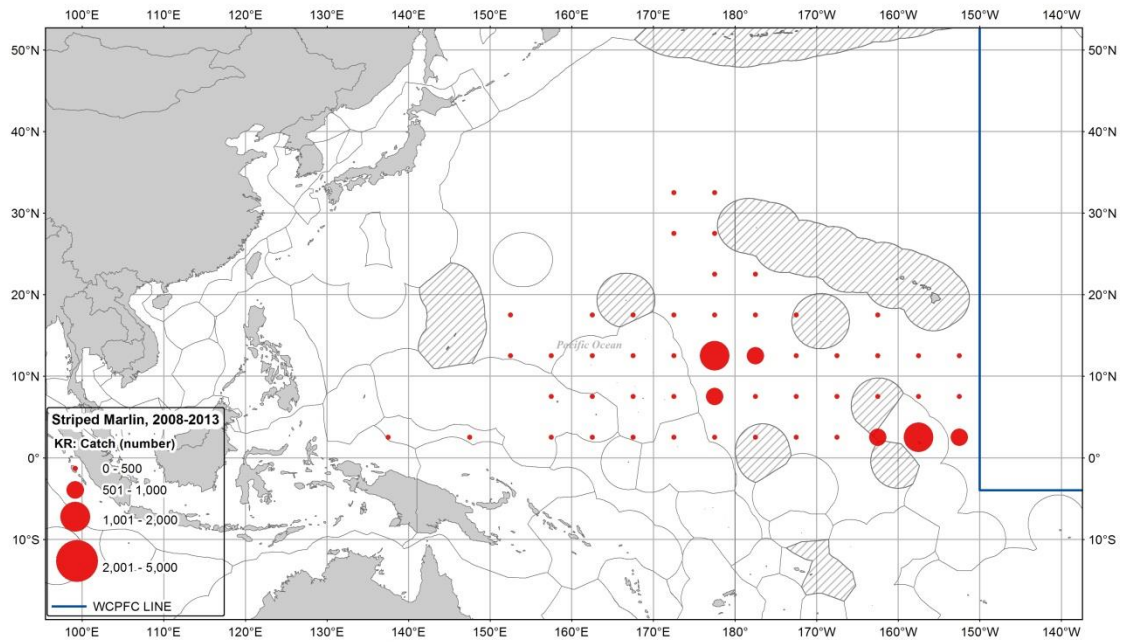
<b>ISC Countries</b>	<b>Total Catch (MT)</b>	<b>Total Years</b>	<b>Catch per Year</b>	<b>First Year</b>	<b>Last Year</b>
<b>UNITED STATES OF AMERICA</b>	12,128.00	34	356.71	1980	2013
<b>REPUBLIC OF KOREA</b>	3,160.00	38	225.72	1976	2013
<b>CHINESE TAIPEI</b>	19,076.00	60	340.64	1954	2013
<b>JAPAN</b>	170,774.00	64	3794.98	1950	2013
<b>Totals</b>	205,138.00		1376.77		

<b>WCPFC Countries</b>	<b>Total Catch (MT)</b>	<b>Total Years</b>	<b>Catch per Year</b>	<b>First Year</b>	<b>Last Year</b>
<b>BELIZE</b>	-	19	-	1995	2013
<b>COOK ISLANDS</b>	-	4	-	2005	2008
<b>FIJI</b>	-	5	-	2009	2013
<b>NEW CALEDONIA</b>	-	1	-	2013	2013
<b>PAPUA NEW GUINEA</b>	-	12	-	1997	2008
<b>SENEGAL</b>	-	1	-	2007	2007
<b>TUVALU</b>	-	3	-	2011	2013
<b>NAURU</b>	0.00	5	0.00	2000	2004
<b>PALAU</b>	0.00	13	0.00	1992	2004
<b>SPAIN</b>	0.00	3	0.00	2004	2006
<b>VIETNAM</b>	0.00	14	0.00	2000	2013
<b>MARSHALL ISLANDS</b>	1.00	22	1.00	1992	2013
<b>KIRIBATI</b>	2.00	19	2.00	1995	2013
<b>FEDERATED STATES OF MICRONESIA</b>	65.00	23	3.61	1991	2013
<b>VANUATU</b>	433.00	10	43.30	2004	2013
<b>PHILIPPINES</b>	791.00	44	19.29	1970	2013
<b>CHINA</b>	1699.00	14	121.36	2000	2013
<b>Totals</b>	2,991.00		34.78		

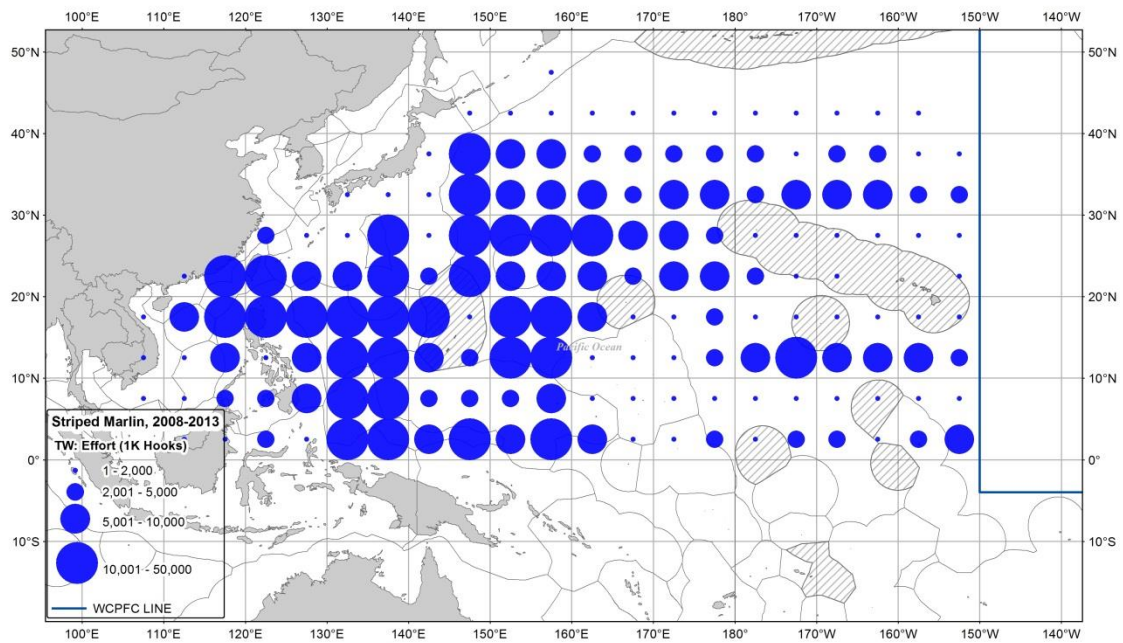
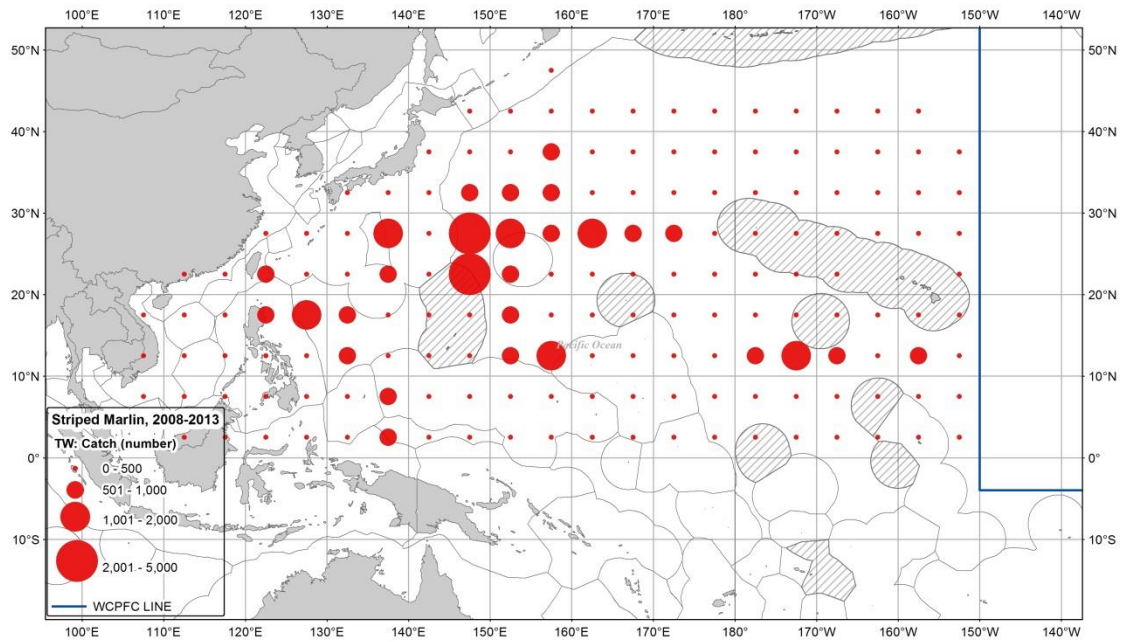


**Figure 1. Distribution of longline catches (red) and effort (blue) in 2008-2013: USA**

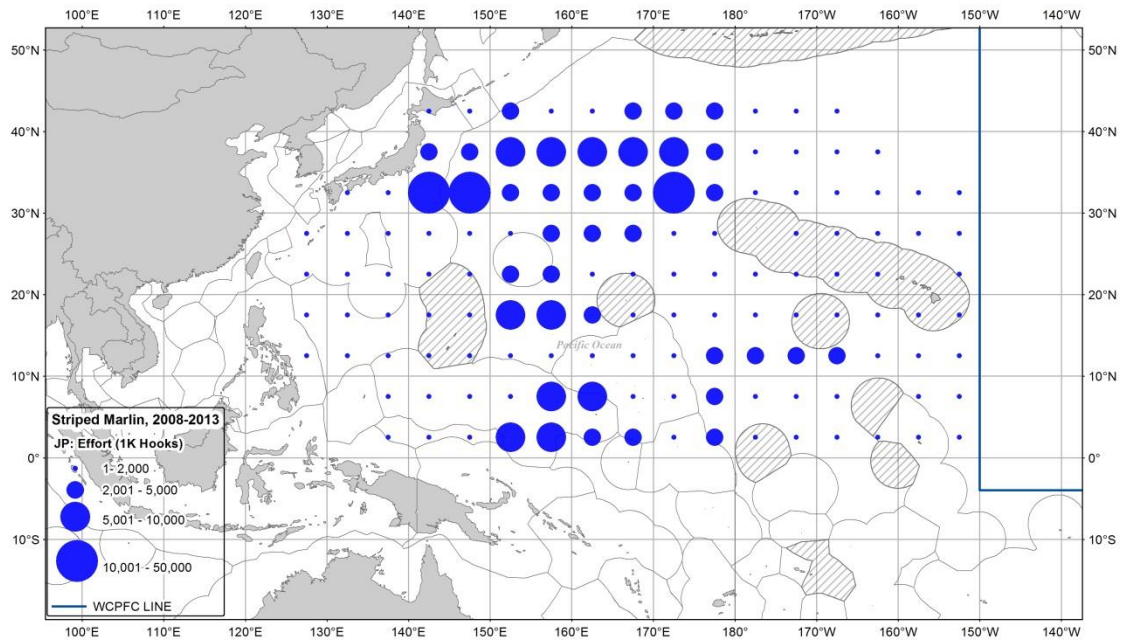
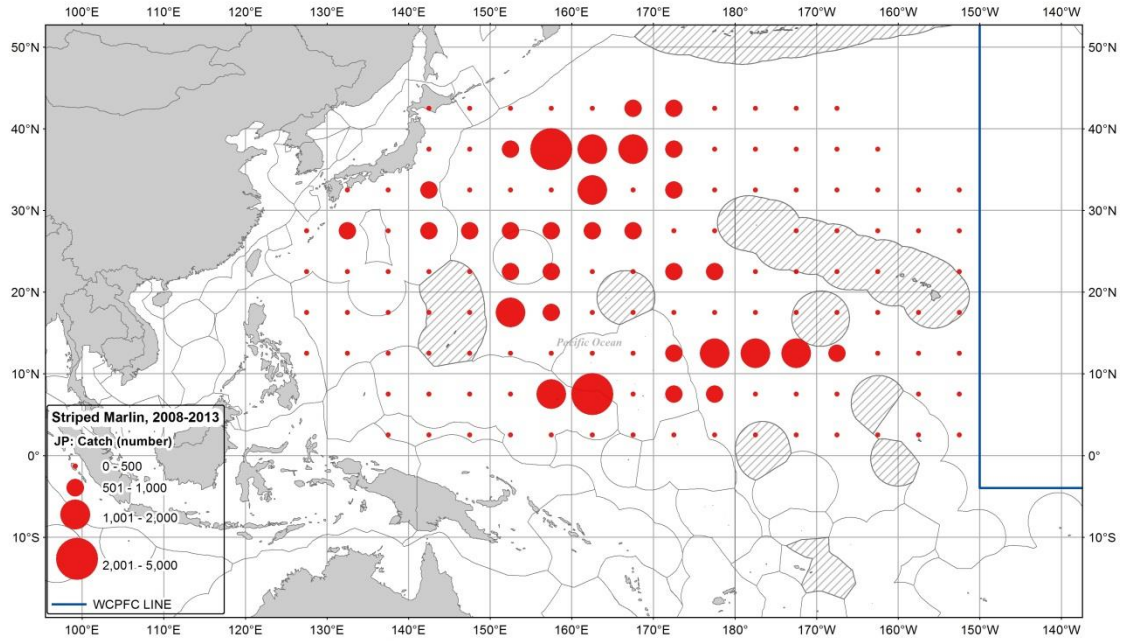




**Figure 2. Distribution of longline catches (red) and effort (blue) in 2008-2013: Korea**

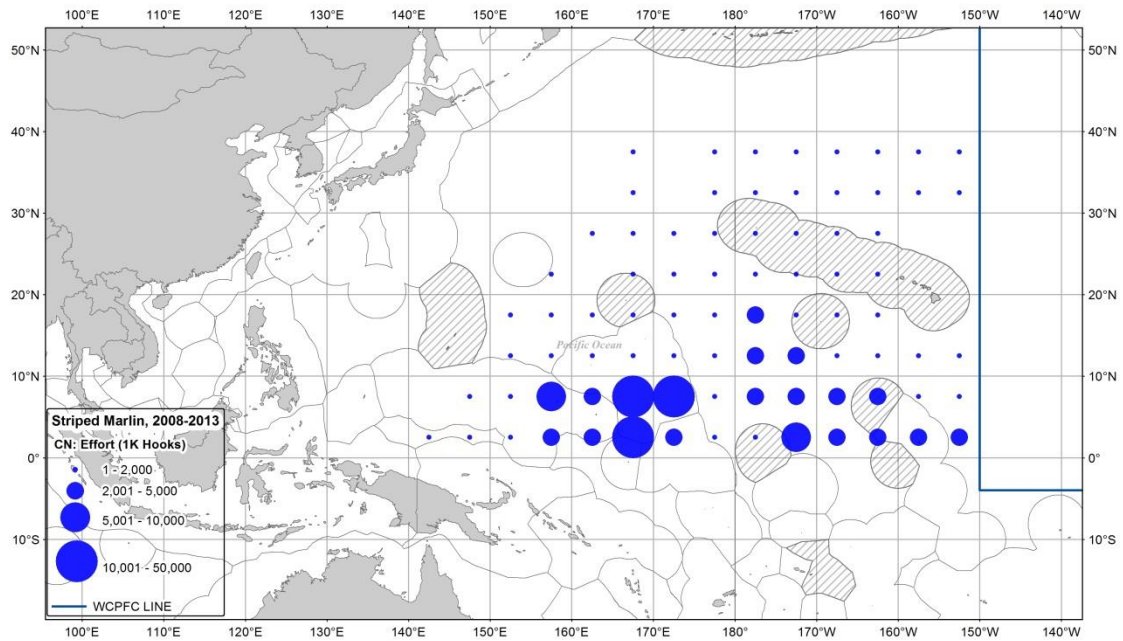
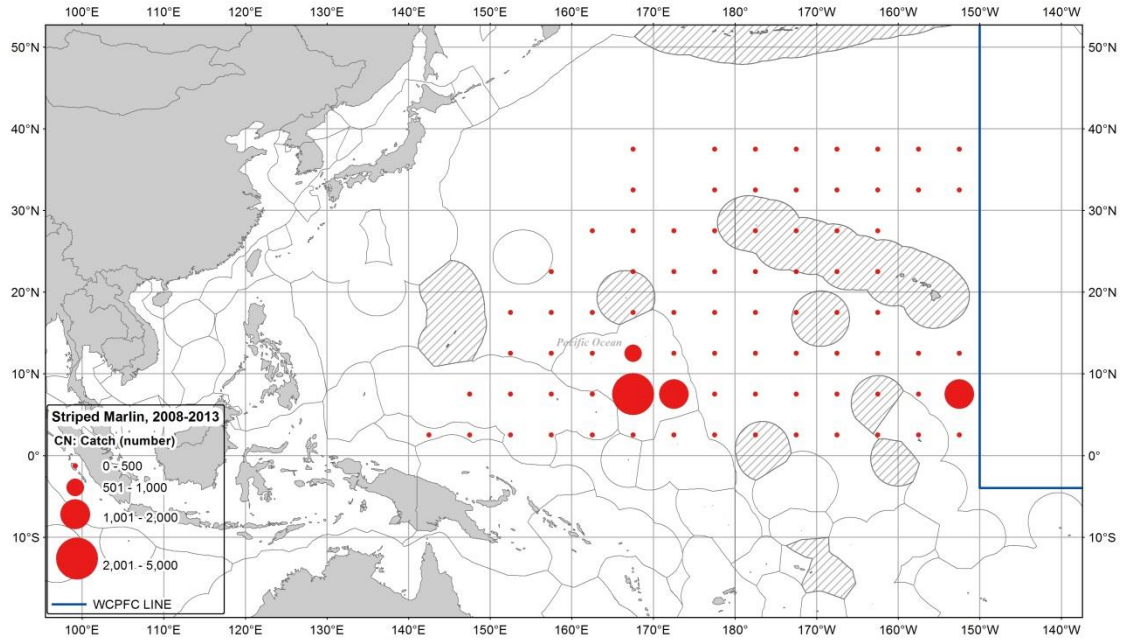


**Figure 3. Distribution of longline catches (red) and effort (blue) in 2008-2013: Chinese Taipei**

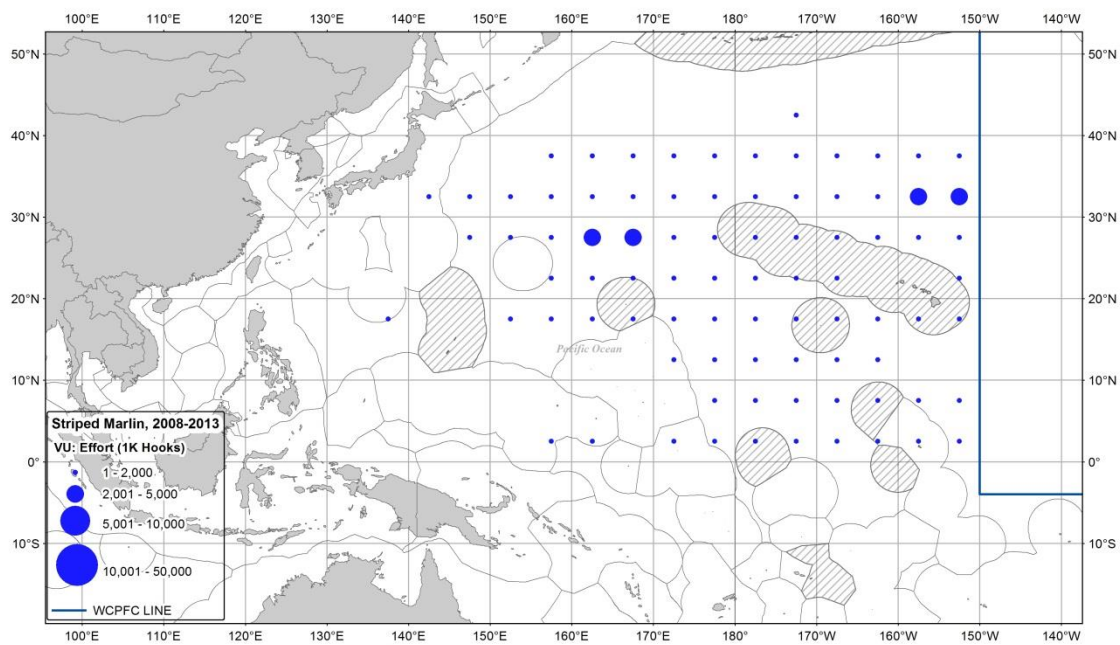
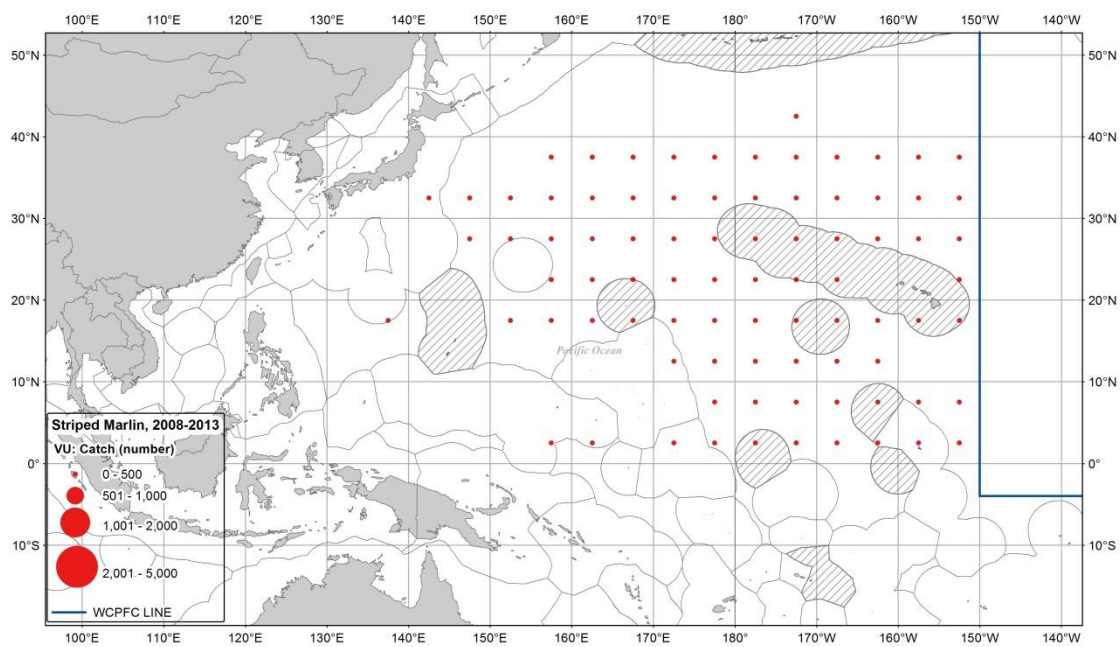


**Figure 4. Distribution of longline catches (red) and effort (blue) in 2008-2013: Japan**

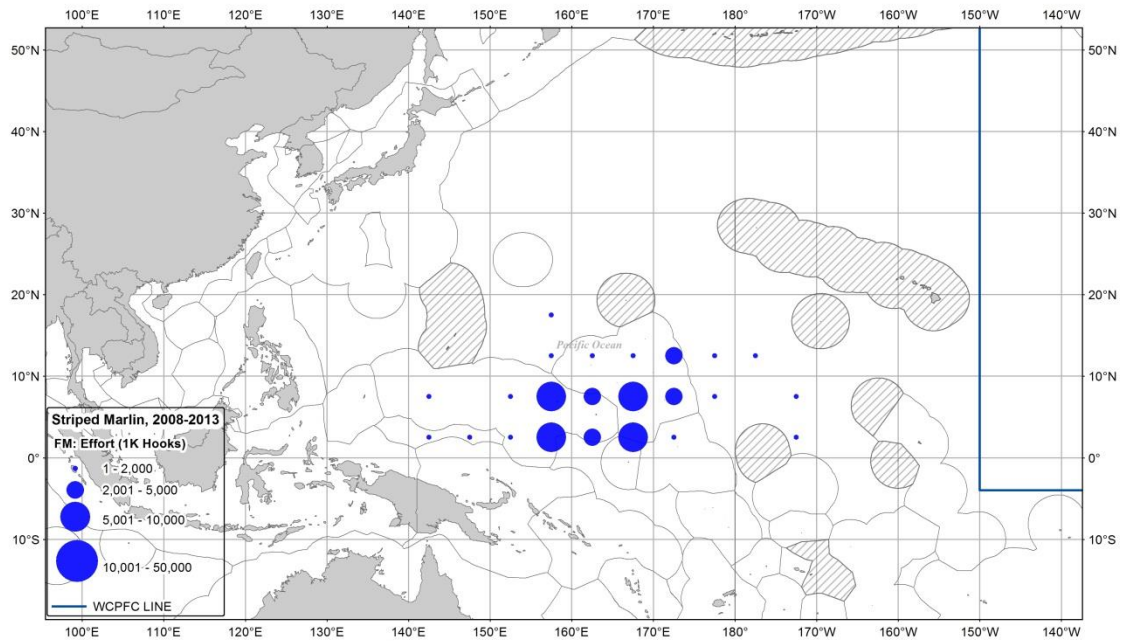
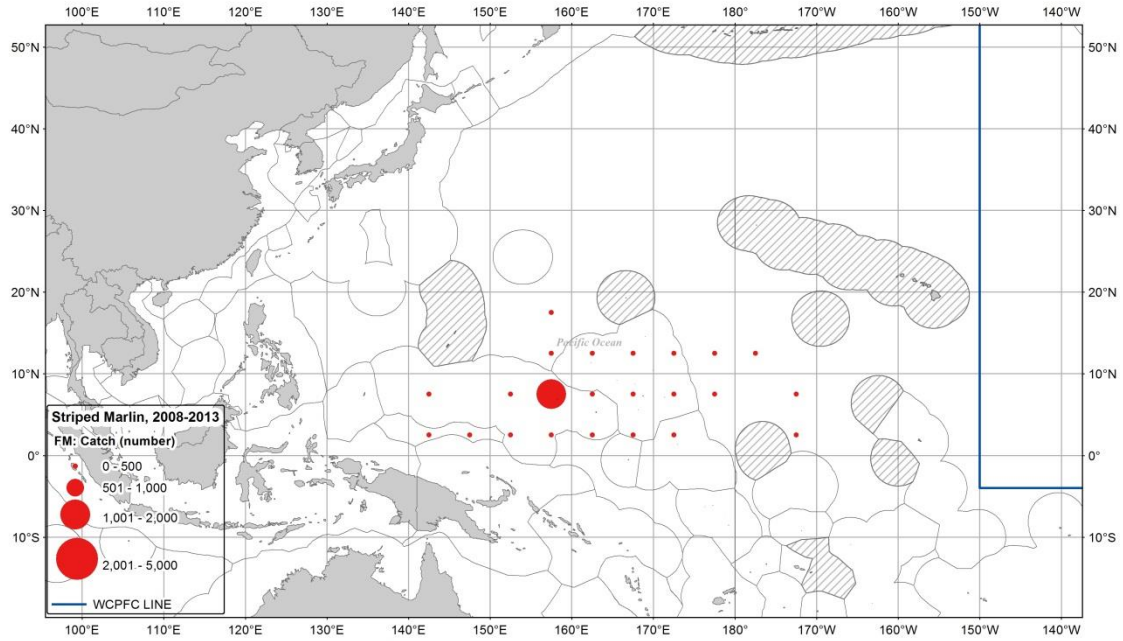




**Figure 5. Distribution of longline catches (red) and effort (blue) in 2008-2013: China**



**Figure 6. Distribution of longline catches (red) and effort (blue) in 2008-2013: Vanuatu**



**Figure 7. Distribution of longline catches (red) and effort (blue) in 2008-2013: Federated States of Micronesia**