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Preliminary review of catch and effort data of shortfin mako shark caught by Japanese offshore and distant-water longliners in the period between 1994 and 2012[1]

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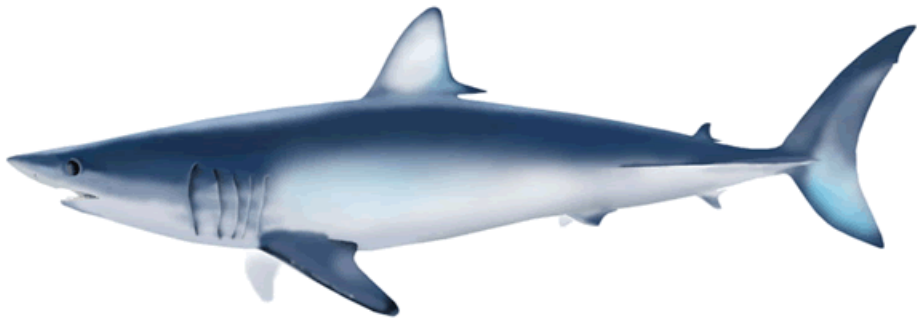

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Summary

Japan introduced new log-book system of Japanese offshore and distant-water longliners is mandated in 1994 which request to report shortfin mako shark landing. Though this information does not contain information of discards, some useful information about this species could be extracted. This study summarized the information of shortfin mako shark in this log-book data. The results of analysis in this study suggests that continuous data is available in the subtropical/temperate region in the northwest Pacific and some better coverage of data is existing in the central north Pacific. The quality and quantity of catch and effort data are better in the earlier years, but it is not so good as those of blue shark

Introduction

Japan introduced new log-book system of Japanese offshore and distant-water longliners is mandated in 1994 which request to report shortfin mako shark landing. Though this information does not contains information of discards, some useful information about this species as the data has relatively longer time series and shortfin mako shark has relatively higher market value among pelagic sharks in Japan.

Material and method

Catch and effort (log-book) data of Japanese offshore and distant-water longliners for 1994 - 2012 is compiled and digitized in the national research institute of far seas fisheries. For the purpose of drawing the distribution map of catch number, CPUE (n / 1,000 hooks) and amount of effort (1,000 hooks), catch and effort data is aggregated by 5 x 5 degrees block. For the analysis, annual data split into 11 areas (Fig. 2), 6 categories of gear configuration denoted by the number of hooks between floats (3 – 4, 5 – 6, 7 – 9, 10 – 11, 12 – 15, and 16 – 24), as well as quarter of the year.

Results and Discussions

In the period analyzed, Japanese offshore and distant-water longliners catch shortfin mako shark in the off northern Japan waters, in the tropical areas in the north and south eastern Pacific, in the off Chilean waters, in the temperate area in the south-central Pacific as well as in the off New Zealand waters (Fig. 1). As years passed, the amount of total effort deployed in the north Pacific (north of equators) decreased and size of operational area reduced especially in the northeastern Pacific (Fig. 1 and Fig. 4). The majority of catch obtained from area 2, the main fishing ground of Japanese offshore surface longliners targeting swordfish and blue shark (Fig. 3). In the tropical region of the central and eastern Pacific (areas 8, 9 and 11),

some continuous catch are obtained but the amount of their annual fluctuating. The reported catch of shortfin mako shark in the eastern Pacific almost disappeared in the period after 2005 (Fig. 5).

In the subtropical region in the northwest Pacific (areas 2 and 3), majority of shortfin mako shark catch obtained by shallow setting (Fig. 5)(number of hooks between floats is 3 – 6), and most of them are caught in the 2nd quarter of the year (Fig. 6).

In the north-central Pacific (areas 6 and 7), catch by deeper sets (number of hooks between floats is larger than 6) dominated in 1994 – 2000 and it replaced by the ones by shallow sets of 3 – 4 hooks per basket (Fig. 5). In the former period, catch in the 1st quarter dominated and it was almost disappeared in the later period (Fig. 6).

In the tropical north Pacific, shortfin mako shark is primarily caught by deep sets (number of hooks between floats is larger than 11) except for the period between 1994 and 1997 in the tropical northeastern Pacific where majority of catches obtained by shallow sets (Fig. 5)(number of hooks between float is 5 -6). In the tropical north Pacific, not apparent seasonality is observed in the catch pattern (Fig. 6).

The results of analysis in this study suggests that continuous data is available in the subtropical/temperate region in the northwest Pacific and some better coverage of data is existing in the central north Pacific. The quality and quantity of catch and effort data are better in the earlier years, but it is not so good as those of blue shark (Hiraoka et. al., 2011).

References

Hiraoka, Y., M. Taguchi, M. Kanaiwa and K. Yokawa (2011) The operation pattern of Japanese tuna longline fishery with the information for prefecture of vessels register and reporting rate in the North Pacific Ocean, 1994-2010. ISC/11/SHARKWG-2/09.

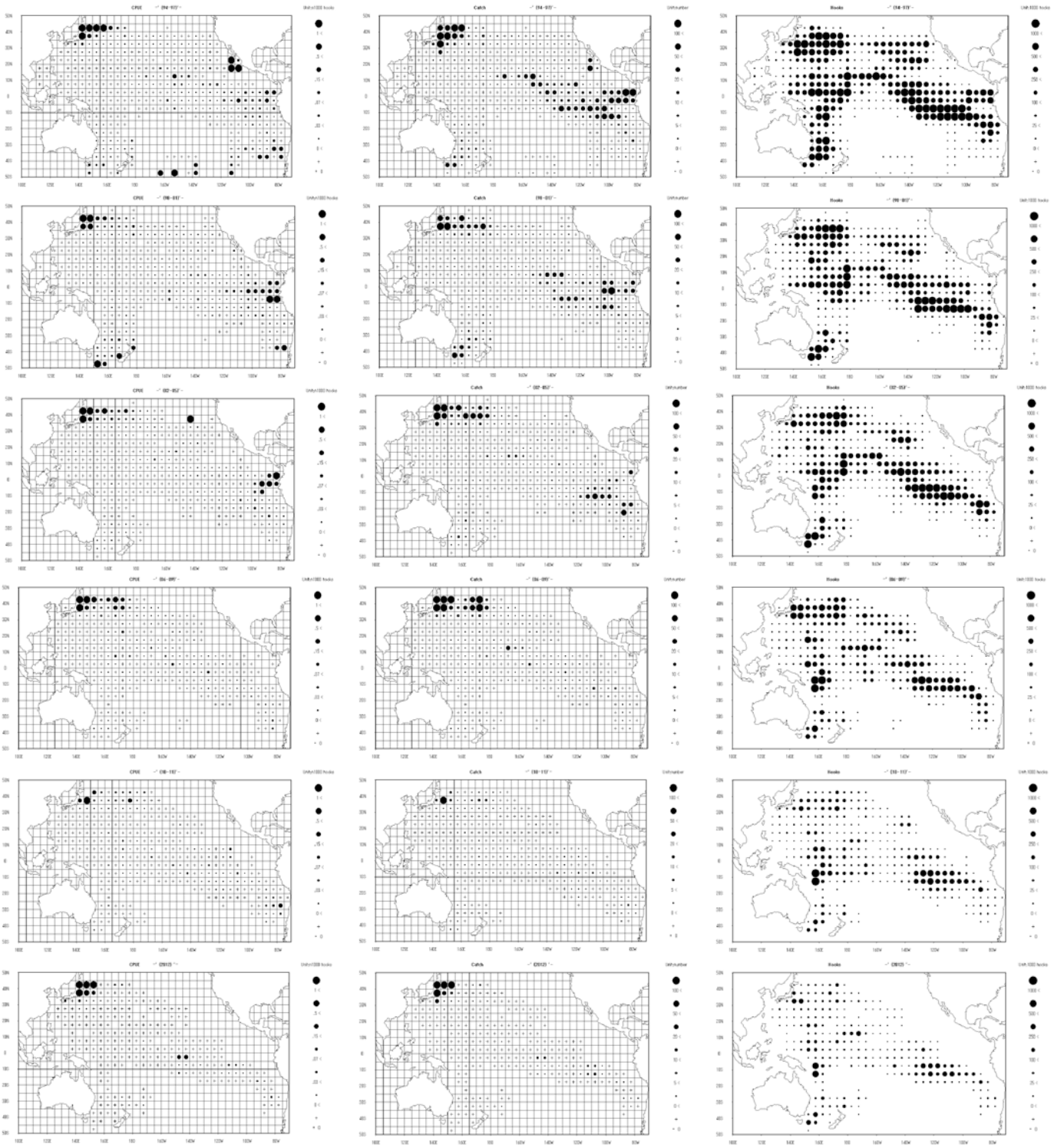

Fig. 1. Distribution of average CPUE (n / 1000 hooks, left column), Catch (number, center column) and effort (1000 hooks, right column) of shortfin mako shark by Japanese longliners in 1994 – 1997, 1998 – 2001, 2002 – 2005, 2006 – 2009, 2010-2011, and 2012.

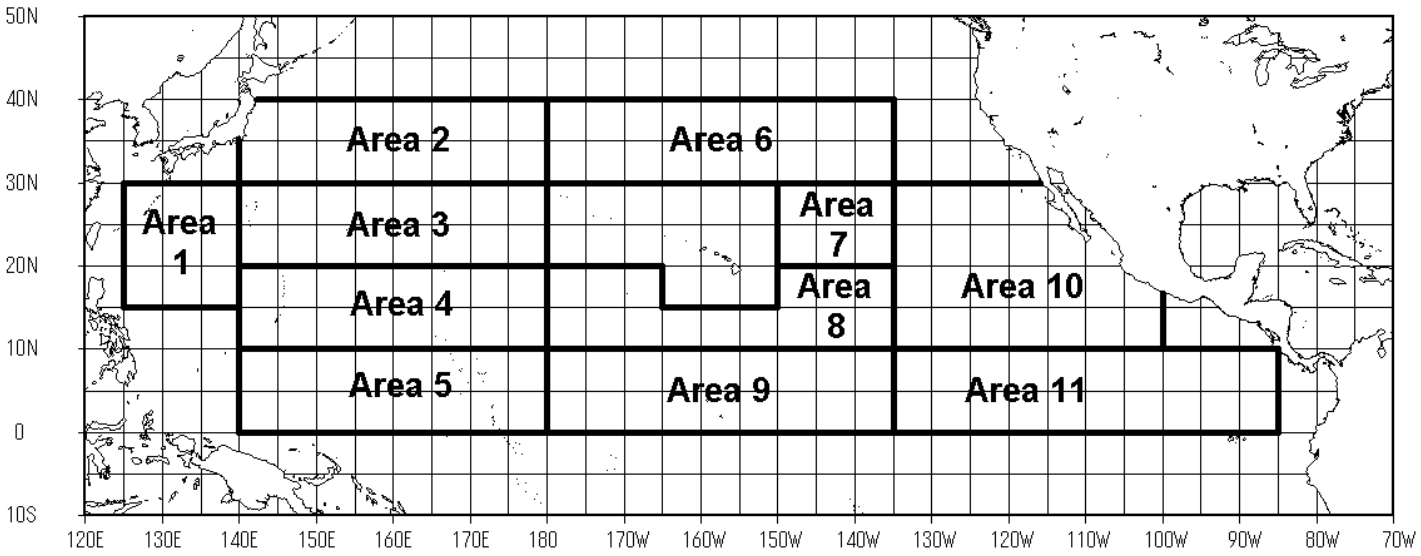

Fig. 2. Area stratification used in this study.

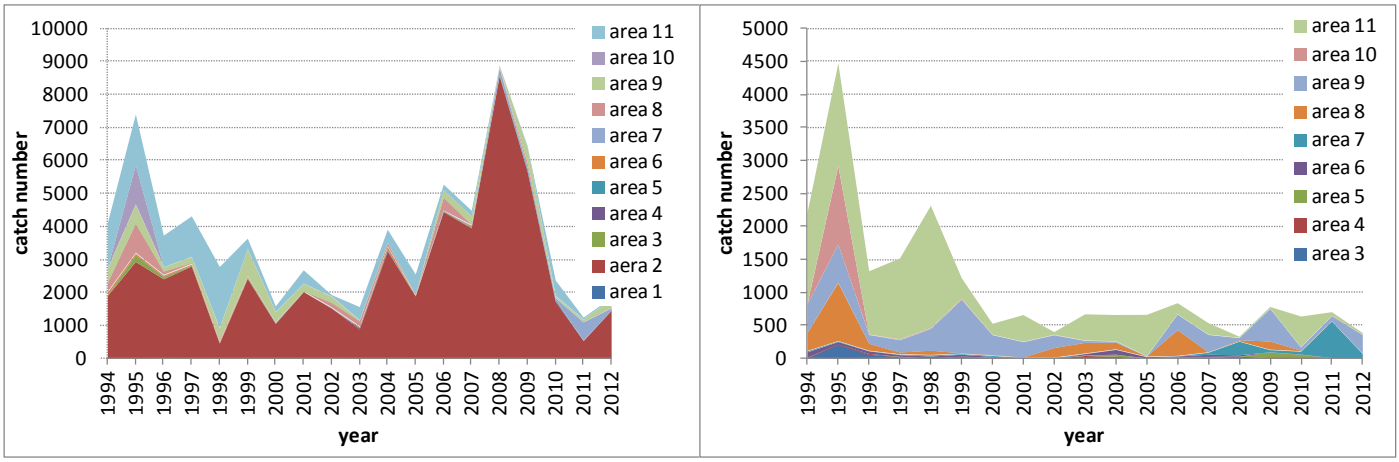

Fig. 3. Area specific annual catch number of shortfin mako shark caught by Japanese offshore and distant-water longliners in the period of 1994 – 2012. Left panel contains data of all area and light panel exclude data of areas 1 and 2.

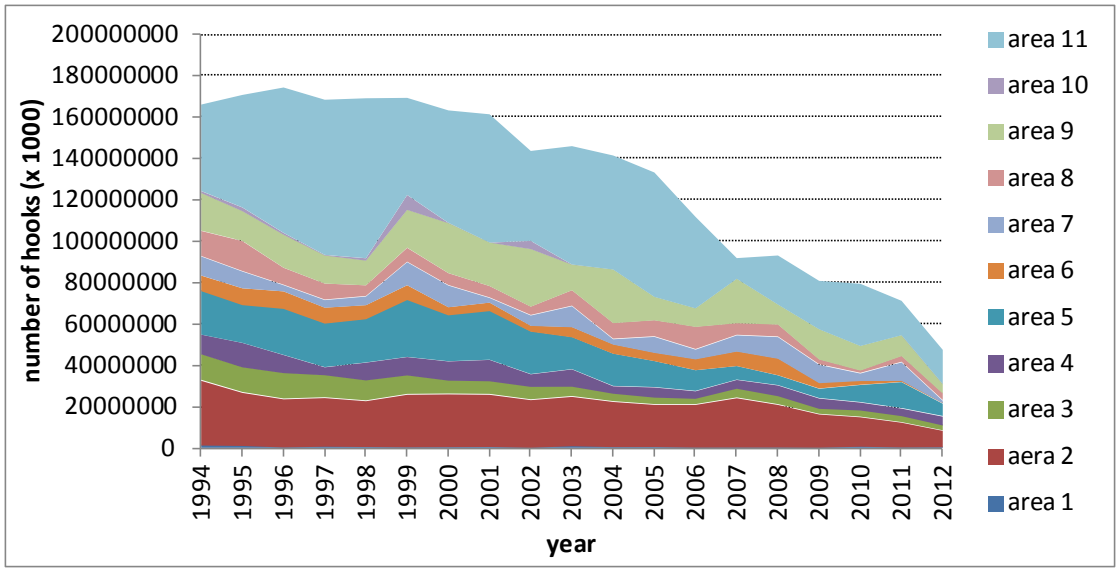

Fig. 4. Annual amount of effort (1000 hooks) by area of shortfin mako shark caught by Japanese offshore and distant-water longliners in the period of 1994 – 2012.

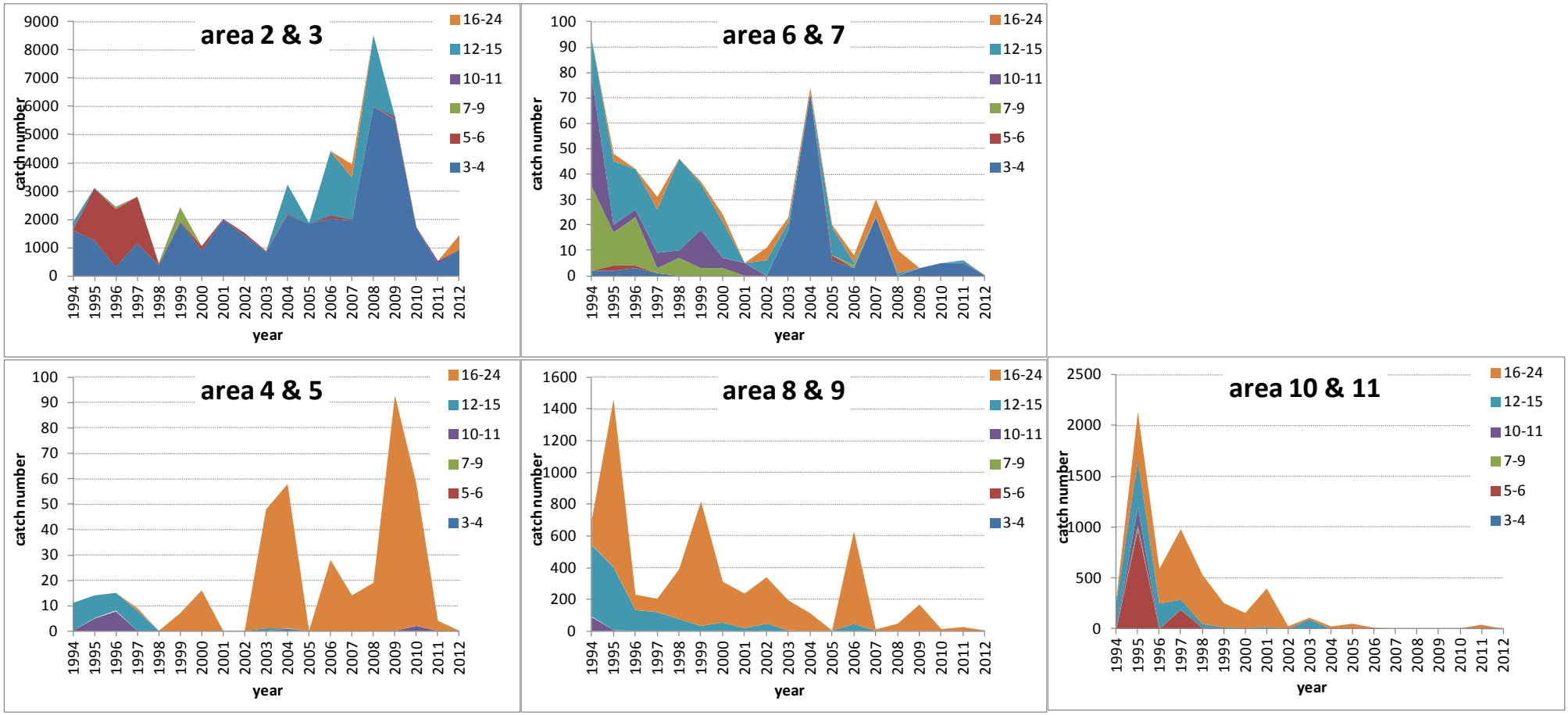

Fig. 5. Catch number of shortfin mako sharks by two adjacent areas and by gear configuration (number of hooks between floats) of shortfin mako shark caught by Japanese offshore and distant-water longliners in the period of 1994 – 2012. Area 1 has no catch of shortfin mako shark.

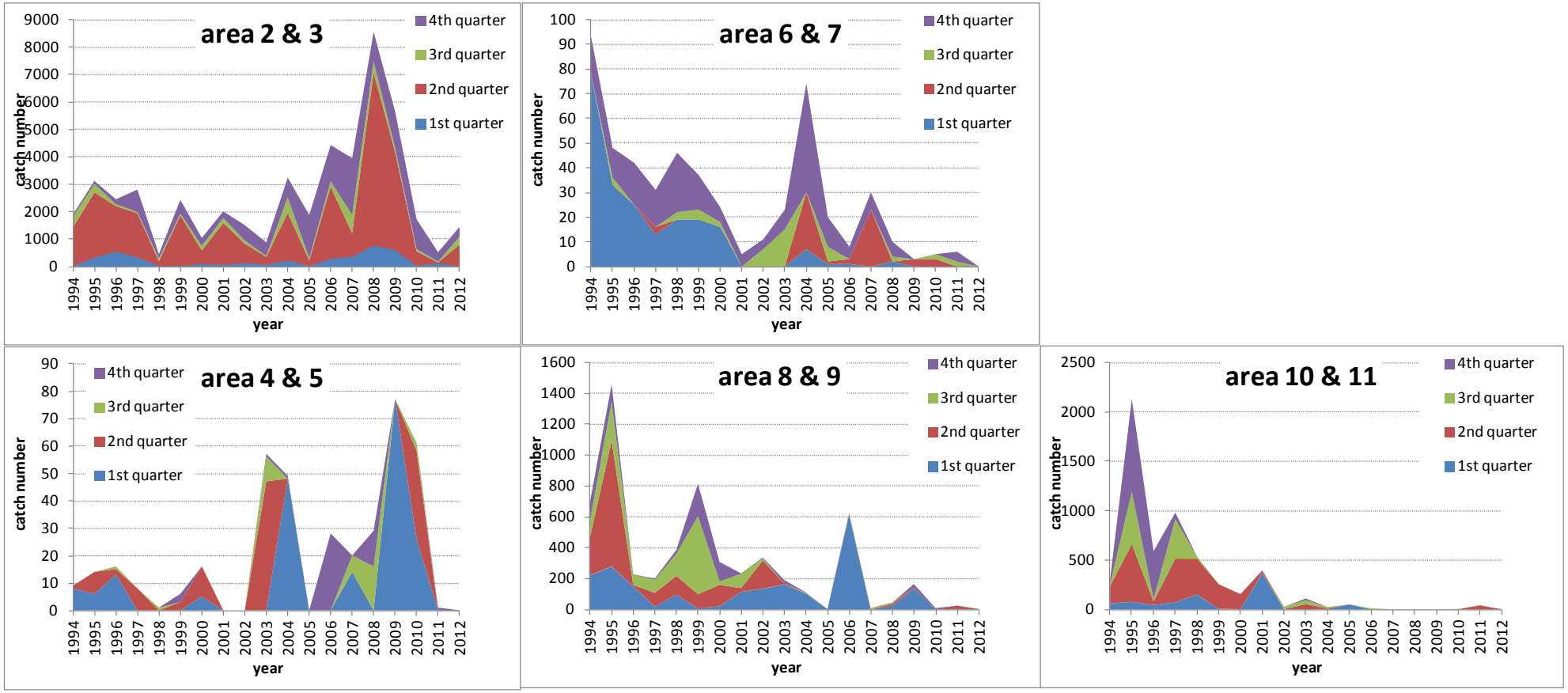

Fig. 6. Catch number of shortfin mako sharks by two adjacent areas and by season (quarter of the year) of shortfin mako shark caught by Japanese offshore and distant-water longliners in the period of 1994 – 2012. Area 1 has no catch of shortfin mako shark.