

## VERIFICATION OF SHARK CATCH DATA REPORTED IN THE LOGBOOKS OF JAPANESE LONGLINE FISHERY

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### SUMMARY

For more than 20 years, Japanese longline logbook reports have included sharks caught. However, the shark catches have not been recorded by species. The logbook format was revised to include the catch number of four shark species since 1991. The logbook data were verified by comparison with the data from the Japanese research vessels and from observer data. The data whose reporting rate reveals the ratio of the number of days when sharks were reported to the number of days of operation per cruise (Nakano and Honma, 1996), has been more than 70% and is considered to be proper. Though the ratio of shortfin mako sharks in the species composition obtained from the logbook data shows a slightly higher trend than that from other data, species composition is very different overall. The CPUEs of each species from the logbook data are lower than others, but the trend is not that much different.

### RÉSUMÉ

Les carnets de pêche de la palangre japonaise ont compris les prises de requins durant plus de vingt ans. Mais ces captures n'ont pas été enregistrées par espèces. Le format des carnets de pêche fut examiné depuis 1991, de façon à inclure le nombre de prises de quatre espèces de requins. Les données des carnets de pêche ont été vérifiées en les comparant avec les données des bateaux japonais de recherche et des données d'observateurs. Le taux nécessaire pour utiliser les données, qui indiquent la proportion du nombre de jours où des requins ont été déclarés par rapport au nombre de jours d'opération par campagne (Nakano et Honma, 1996), est considéré comme étant adéquat à partir d'un pourcentage supérieur à 70 %. Bien que la proportion d'*Isurus oxyrinchus* ("shortfin mako") dans la composition par espèces obtenue à partir des données des carnets de pêche présente une tendance légèrement plus élevée à celle issue d'autres données, les compositions par espèces ne sont pas, dans leur ensemble, très différentes. La CPUE de chaque espèce, d'après les données des carnets de pêche, est inférieure à d'autres, mais la tendance ne diffère pas beaucoup.

### RESUMEN

Los cuadernos de palangre de Japón han incluido capturas de tiburones durante más de veinte años, pero no han sido registrada por especies. Desde 1991 se examinó el formato de los cuadernos de pesca para incluir el número de capturas de cuatro especies de tiburones. Se han verificado los datos de los cuadernos de pesca comparándolos con los datos de los barcos de investigación y datos de observadores de Japón. La tasa necesaria para emplear los datos, que indican el ratio del número de días sobre información de tiburones en relación al número de días de operación por campaña (Nakano y Honma, 1996) se considera adecuada a partir de un porcentaje superior al 70%. Aunque el ratio del tiburón marrajo en la composición por especies obtenida de los datos de cuadernos de pesca muestra una tendencia ligeramente superior al de los otros datos, las composiciones por especies no son muy distintas en su conjunto. La CPUE de cada especie, según los datos de los cuadernos de pesca es inferior en algunos casos, pero la tendencia no difiere mucho.

### Introduction

Shark catch of Japanese longline fishery had been recorded not by species but only as "sharks" since 1971 till 1992. But in 1991, the logbook format was revised to record catch number of three shark species, such as blue shark (*Prionace glauca*), porbeagle (*Lamna nasus*) and shortfin mako shark (*Isurus oxyrinchus*) and other sharks. Nakano & Honma (1996) pointed out that there are various reporting style which depends on the strategies of the fishing vessels how to treat the captured shark and that the logbook data must be categorized by the reporting style for the CPUE analysis. So in this paper, to verify the logbook data records, we compared the species composition and CPUE obtained from the logbook data with those from the research data of Japanese research vessels in the North Pacific Ocean and the observer data collected in the Atlantic Ocean.

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## Materials and Methods

The new format logbook data of Japanese longline fishery compiled by National Research Institute of Far Seas Fisheries (NRIFSF), and the shark catch data by species obtained by the Japanese research vessels in the Pacific Ocean and observer data collected in the Atlantic Ocean in winter season were used for the analysis. In the logbook, the catch number of three shark species and other sharks are recorded as described above. In the data of Japanese research vessels and observer, the catch number of sharks are recorded by species. To compare the data in the same area and period, three areas in the Pacific Ocean and two areas in the Atlantic Ocean are selected (Fig.1). Logbook data is categorized by the reporting rate which reveals the ratio of the number of the days when shark was reported to the total number of the days operated in a cruise (Nakano & Honma 1996). The summary of the data is shown in Table 1.

## Results and Discussion

### Selection of data:

The reporting rates of the Japanese research vessels which recorded all shark catch were more than 60%. So the logbook data which include all kinds of shark catch might indicate the reporting rate more than 60%. Conversely most of the logbook data whose reporting rates are more than 60% are considered to include all kinds of shark. On the contrary, in the logbook data whose reporting rate is less than 60%, only the retained shark may be recorded as Nakano & Honma(1996) indicated. Therefore it is necessary to use the logbook data whose reporting rate are at least 60% for analyzing the CPUE. For getting more reliable results, it is considered to be proper to use the data whose reporting rate is more than 70% as Nakano & Honma(1996) did. After this, comparing the logbook data whose reporting rate are more than 70% and the data of research vessels or observers was done.

### Comparing the data of Japanese research vessels and logbook data:

Fig.2 shows the species composition in the area 1-3. Blue shark is the dominant species and occupied about 80% in the area 1 and 2. In the area 3, blue shark is only 30-40%, and other sharks occupied a larger part which is supposed to be composed of mainly oceanic whitetip (*Carcharhinus longimanus*), silky shark (*C. falciformis*) and bigeye thresher (*Alopias superciliosus*). Species composition are not much different between the data of Japanese research vessels and these of logbook among areas,

although small difference are observed in the occurrence ratio of shortfin mako shark in the area 2 and 3, and blue shark in the area 3. It is supposed that shortfin mako shark is retained and recorded more frequently than other species in the fishing vessels, because of the high market value.

Fig.3 shows the seasonal fluctuations of blue shark CPUE (number of catch/1000 hooks) from the two data series in the area 2 and 3. CPUE obtained from the logbook data is lower than that from the data of Japanese research vessels. Introduction of nylon monofilament leader in the commercial longline fisheries in recent years is considered to be one of the cause. But the trends of CPUE fluctuations are not so different, though in the short period. It is necessary to examine about these hereafter.

### Comparing the observer data and logbook data:

Species compositions from the two data series are not different in the east-central Atlantic (Fig.4). Blue shark is the dominant species and occupied about 80-90%, which is the similar result in the area 1 and 2. On the contrary, these in the northwestern Atlantic are different (Fig.4). The ratio of blue shark was the highest in the observer data, however that of shortfin mako shark was highest in the logbook data. The frequency of recording blue shark catch might become much low because of the stormy weather in the area and the season.

From the results mentioned above, it is considered that the logbook data whose reporting rate is more than 70% includes all kinds of shark catch, since species compositions are not different with both the research data of Japanese research vessels and the observer data.

Although, there is some difference about the CPUE level of blue shark, it is considered that the logbook data could represent abundance index of sharks, since species composition and CPUE trends are similar to those of the research data. But more study is necessary to analyze the CPUEs of each species from the logbook data of Japanese longline fishery.

## Reference

Nakano, H. and M. Honma 1996: Historical CPUE of pelagic sharks caught by Japanese longline fishery in the Atlantic Ocean. ICCAT,SCRS/96/35,9pp.

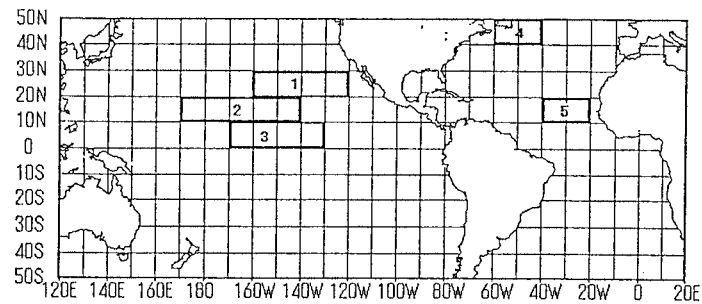


Fig.1 Area strata used in the analysis.

Table 1 Number of operations, hooks and shark catch in each area.

Year	area-1			area-2			area-3		
	op.	hooks (*1000)	sharks	op.	hooks (*1000)	sharks	op.	hooks (*1000)	sharks
logbook 91-95	408	1230	1634	986	2466	6470	1332	3150	7156
J.R.V 92-95	2267	5004	16297	5369	11720	95085	639	1377	8131

Year	area-4			area-5		
	op.	hooks (*1000)	sharks	op.	hooks (*1000)	sharks
logbook 95,96	359	936	768	169	434	427
observer 95,96	40	89	711	13	33	165

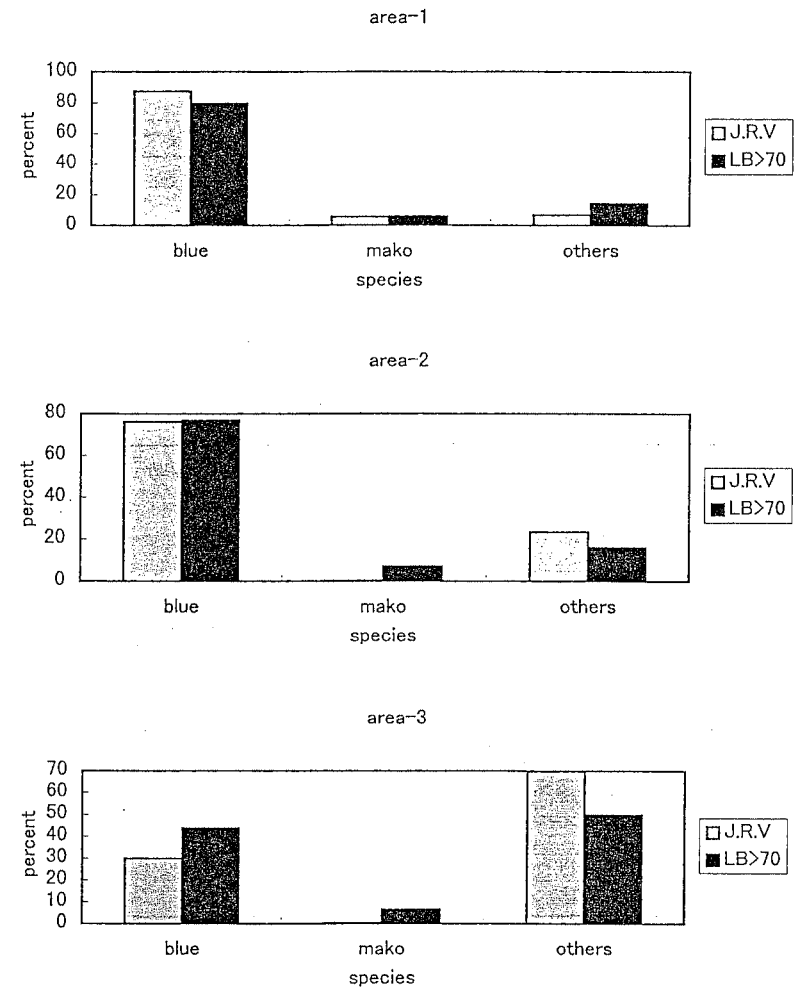


Fig.2 Comparison of the species composition between the data of Japanese research vessels and the logbook data whose reporting rate is more than 70%. J.R.V:Japanese research vessels. LB>70:Logbook. blue:blue shark mako:shortfin mako shark

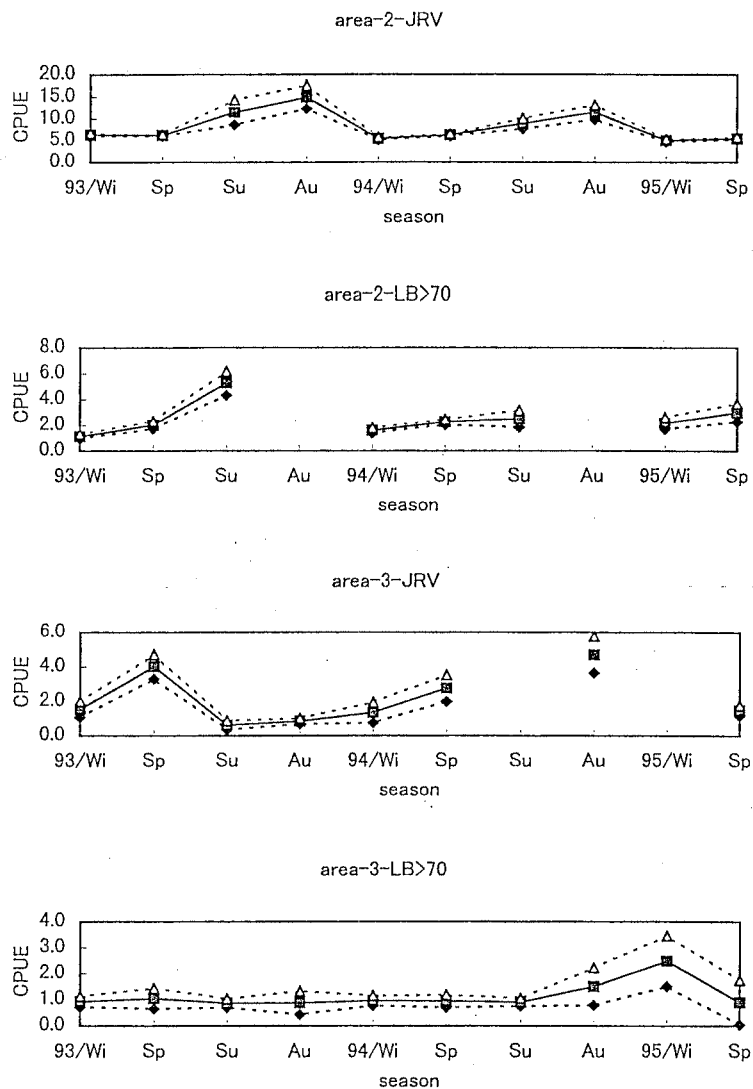


Fig.3 Seasonal fluctuations of blue shark CPUE obtained from the Japanese research vessels and logbook data whose reporting rate are more than 70%. JRV:Japanese research vessels. LB>70:Logbook. Dotted line: 95% confidence line.

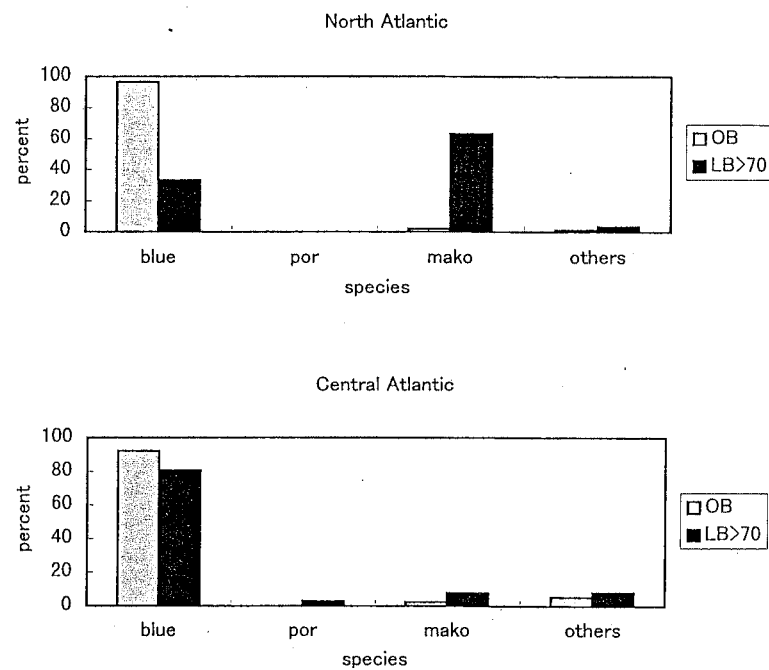


Fig.4 Comparison of the species composition between the observer data and logbook data in the North and Central Atlantic. OB:observer. LB>70:logbook. blue:blue shark, por:porbeagle, mako:shortfin mako shark