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Problems of Japanese Purse Seine

Size Data

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Problems of Japanese purse seine size data

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The Japanese size data of catch generally consists of measurements at landing ports by field technician, measurements on board of training and survey vessels, and voluntary basis on-board measurements by commercial fishermen. Quality and reliability of data will drop in this order. In the case of purse seine fishery, the measurements at landing ports extremely difficult especially for single purse seiners operating in the tropical water. There are few survey vessels operating purse seine on tunas. Therefore, the collection of size data is almost exclusively relied on the measurements by commercial fishermen, which induces a lot of problems to the Japanese purse seine size statistics. // why?

The review of available size data done by the WPYRG provided a good opportunity to look into the quality of our data source. This is a quick list of some of the problems recognized during the last few years.

Figure 1 shows the ratio of purse seine catch which was not covered with corresponding size data and the reason of that. This reveals several problems.

1. The missing of set type code in the logbook :

This was the major reason not covered by size data for 1981 and 1992. However, this type of problem was disappeared after 1983.

2. Catch in Area 1 :

This is the area where domestic fleet operating. They are not required to measure a certain number of fish caught like fleets operating in the tropical waters. Currently, there is no way to get size information of catch in Area 1, except very scarce measurements at landing ports.

3. Decrease of fish measured (Figure 2) :

Apparent size data coverage shown in Figure 1 maintained a certain level but the number of fish actually measured was decreasing. There were slight increase in measurement in 1990 and 1991 but prospect is not promising.

4. Tendency to measure in 5 cm interval (Figure 3) :

Figure 3 shows the size frequency of measured fish in 1991 and puts a black color to the column for every 5 cm. Apparently, the black columns extrude from overall distribution. To solve this problem, 5 cm moving averages were taken when processing data.

5. Preference of size category to measure :

It was noted that some fisherman only measured fish bigger than 80 cm and some others did the opposite. Even without intention to select or avoid some size category, it seemed that large fish was measured more often than expected from random sampling. Maybe, it is because a big fish in a bunch of small fish easily catches a fisherman's eye.

Two size categories (bigger than 10 kg and less than that) were distinguished in Japanese logbook format. We added a size category code to size data after 1989 according to the size of fish measured and claimed catch category. For example, when only large fish measured but both small and large yellowfin catch claimed, the code of that size data becomes 'large'. In contrast, if fisherman only claims small yellowfin tuna catch, the size data will be classified to 'small' even which including measurements of large fish.

Figure 4 shows the comparison when processing these data stratified by size categories or not. The stratified processing greatly raises the number of small fish. Right now, we cannot tell which image is closer to the actual situation, though it should be noticed that this extent of difference in size distributions leads to completely different figures of stock structure when applied to the catch at age analysis.

Size Data Coverage of Jap. PS

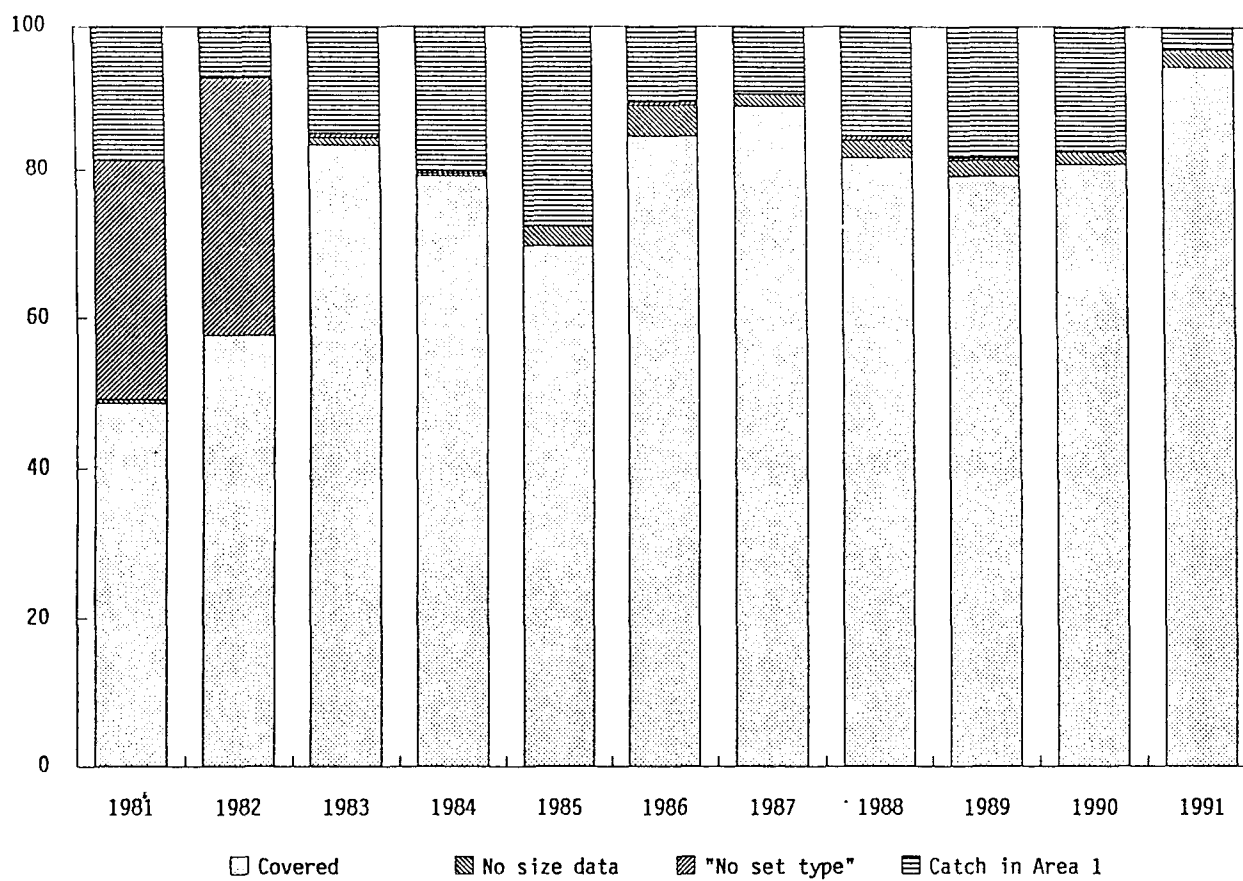


Figure 1. The ratio of catch covered with size data. When catch was not covered with size data, it was classified into reasons of that.

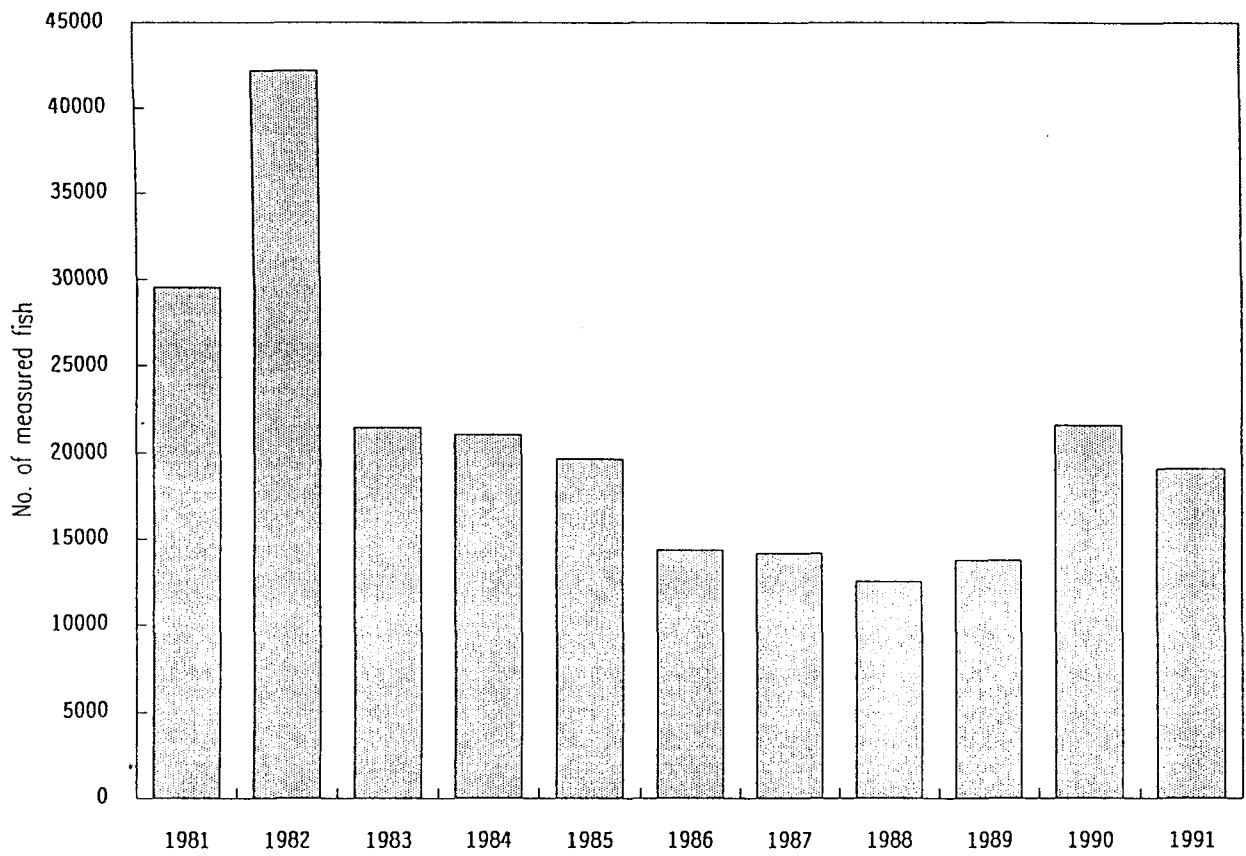


Figure 2. The number of fish measured.

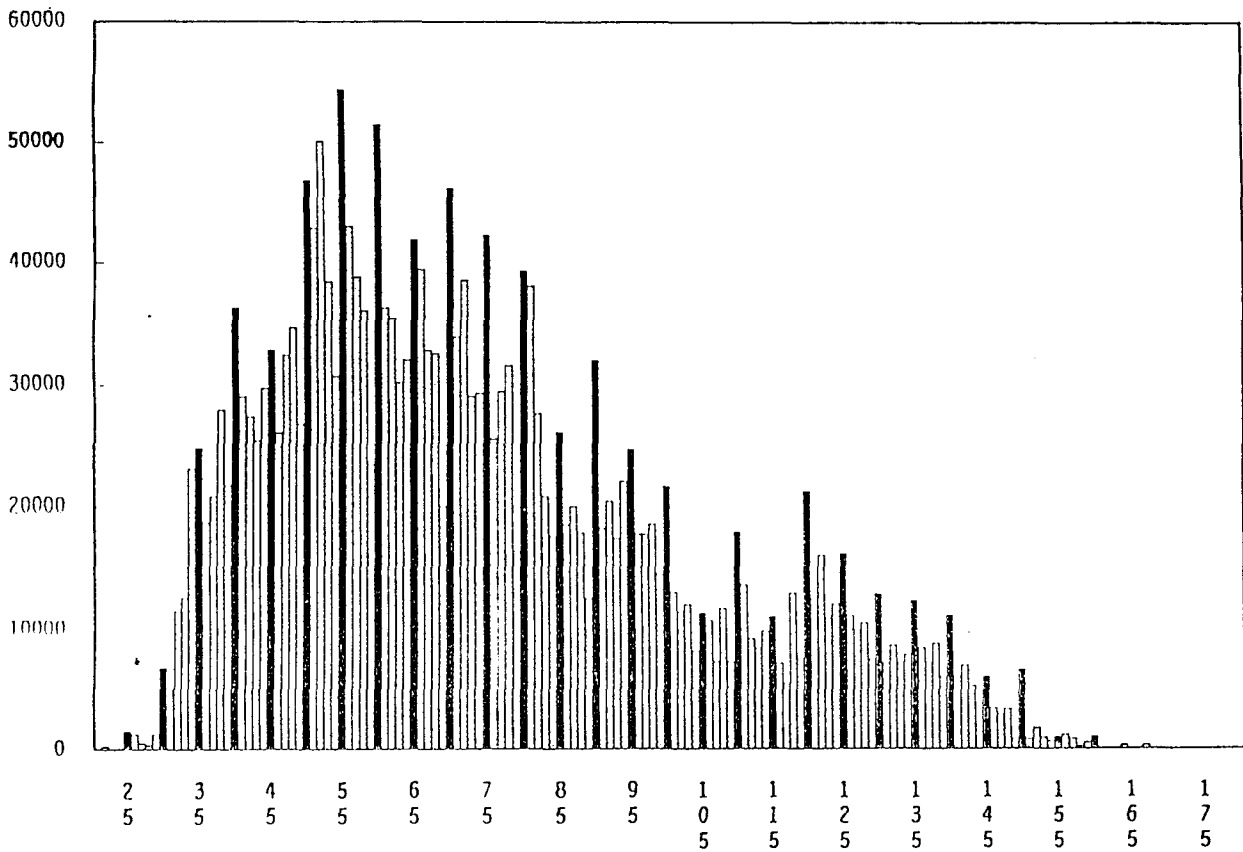


Figure 3. Size distribution of 1991 measured fish. Columns in every 5 cm were shadowed in black.

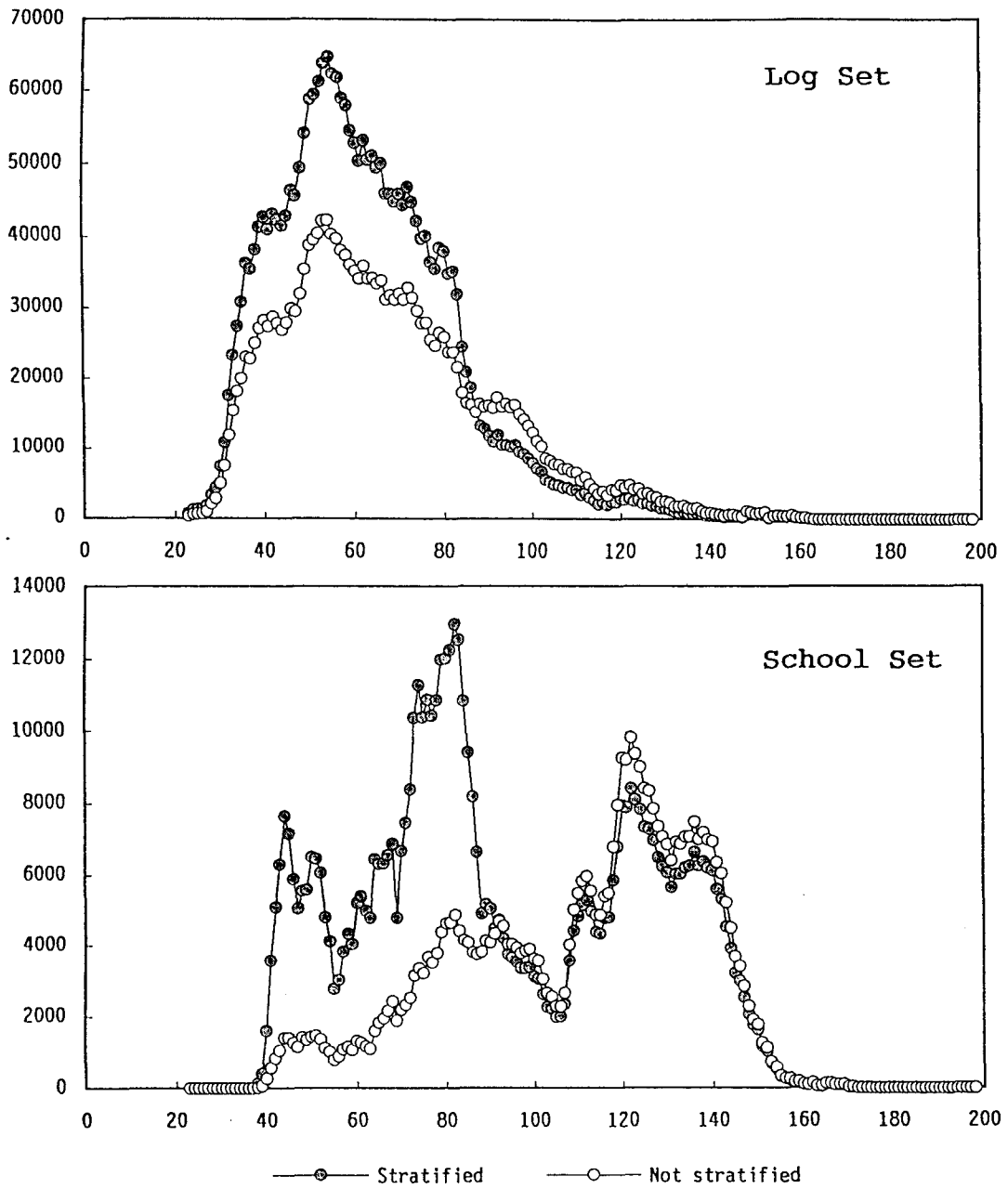


Figure 4. The comparison of estimated size distribution of catch, when processing size data by size categories or not.