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THE EXPERIMENTAL TRAILS FOR DEVELOPMENT OF MITIGATION MEASURES FOR REDUCING JUVENILE BIGEYE TUNA BY-CATCH IN JAPANESE PURSE SEINE FISHERIES

Submitted by the Government of Japan

Introduction

In accordance with the paragraph 7 of CONSEVATION AND MANAGEMENT MEASURES FOR BIGEYE AND YELLOOWFIN TUNA IN THE WESTEN AND CENTAL PACIFIC OCEAN (Conservation and Management Measure 2006-01), Japanese Government by cooperation with research institute and industries has conducted two experiments for reducing fishing mortality of juvenile bigeye tuna in purse seine fisheries in 2007. The purpose of this paper is to contribute Commission's effort for introducing conservation and management measures for reducing fishing mortality of juvenile bigeye tuna in tropical region.

The first experiment was investigation of the relationship between catch ratio of bigeye tuna to total catch and the depth of underwater structure of FADs (Fish Aggregation Devices) and the second experiment was investigating the effect of using large mesh sized net to body net on by-catch rate of juvenile tuna experiment.

Summary results of two experiments

1) **The relationship between catch ratio of bigeye tuna to total catch and the depth of underwater structure of FADs**

   Japan submitted the preliminary result of this experiment as a paper WCPFC-SC3-FT SWG/WP-4 at the Third Regular Session of Scientific Committee. The relationship of the species composition of purse seine catch and depth of FADs in Papua New Guinea region was investigated by port samplings and by the log book from May to June 2007 at the

mother ports(Fig. 1). The 17 sets of port sampling data were collected at Yaizu port and Makurazaki port in Japan and 65 sets of log book data were investigated (Table 1). We used two statistical analyses and it was found that the depth of FADs had no significant effect on the ratio of juvenile bigeye tuna catch per set (Fig. 2). This research is continued to be carried out.

2) The effect of using large mesh sized net to a part of body net on bigeye tuna by-catch rate

In Japanese purse seine fisheries, mesh size of body net (Fig. 3) can be roughly divided into 210mm (smaller sized mesh) or 300mm (large sized mesh). The relationship between bigeye tuna by-catch rate and mesh size was investigated in 9 purse seine vessels which used large sized mesh and by 28 vessels which used smaller sized mesh, mainly 210mm, in 2006. The juvenile bigeye tuna by-catch rate was 0.10% of the total catch in the large-mesh 9 vessels and that of the small-mesh 28 vessels was 0.23% (Table 2). This research is still ongoing and we will keep investigating. At this stage, we believe that the use of large sized mesh to a part of body net has potential positive effects on reducing fishing mortality of juvenile bigeye tuna.

Suggestion

Although we have been discussing mitigation measures for juvenile bigeye and yellowfin tuna fished around FADs since the establishment of the WCPFC, we have not yet identified and introduced effective mitigation measures to the FADs operations. As a member of the WCPFC, Japan has taken actions as provided above following the conservation and management measure 2006-01, which was agreed last year.

We would like to suggest that other Members, Cooperating Non-members and Participating Territories take similar actions for reducing fishing mortality of bigeye tuna, and we believe that the WCPFC should consider introducing a measure to require large mesh (larger than 300mm) to the purse seine operation in tropical region.
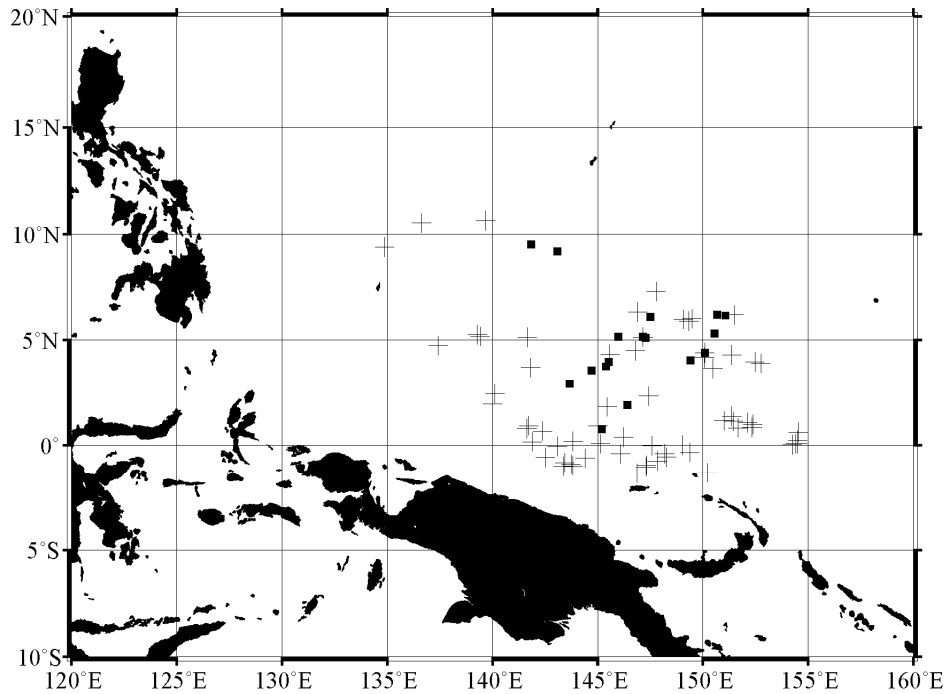
Fig. 1: Location of operation of Japanese purse seine in May to June 2007. Solid square (■) and cross (＋) show operational positions of investigated data set by port sampling and log book, respectively.

Table 1. Number of cruise and set, operation location, depth of under water structure of FADs (m), (depth of FADs), coverage of measurement to total catch per set (measurement coverage).

Data set		port sampling	log book
Number of cruise		13	9
Number of set	Total	17	65
	FADs	14	26
	Log	3	39
Operation	Latitude	9°32′ N - 0°46′ N	10°38′ N - 1°21′ S
	Longitude	141°50′ E - 150°40′ E	136°38′ E - 154°32′ E
depth of FADs (m)		25.0 - 75.0	0.0 - 50.0
measurement coverage* (%) (avg (SD))		2.0 (1.6) (%)	-
total catch per set (t)		20 - 220	5 – 200

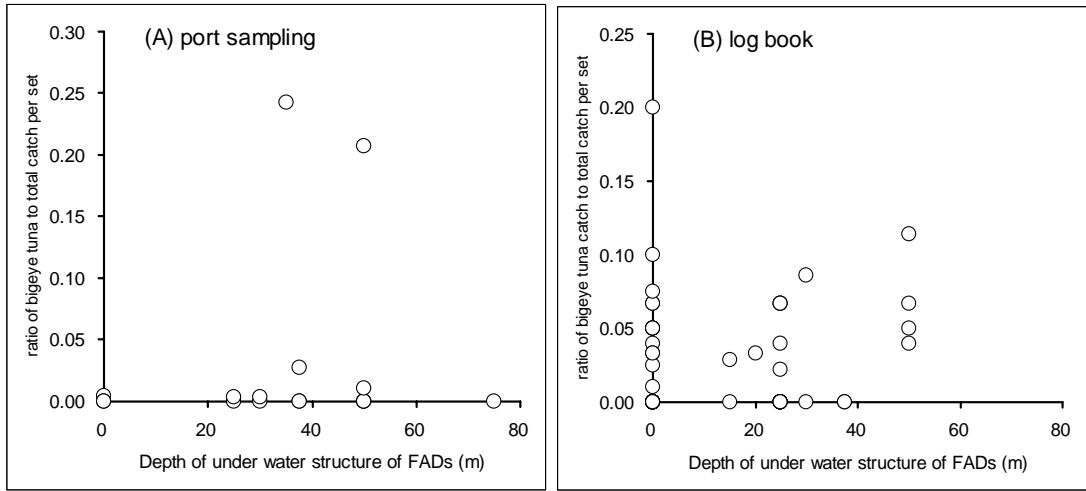* Measurement coverage means the coverage which is monitored by researchers.

Fig. 2: The relationship between depth of underwater structure of FADs and the ratio of bigeye tuna catch to total catch per set of (A) port sampling and (B) log book.
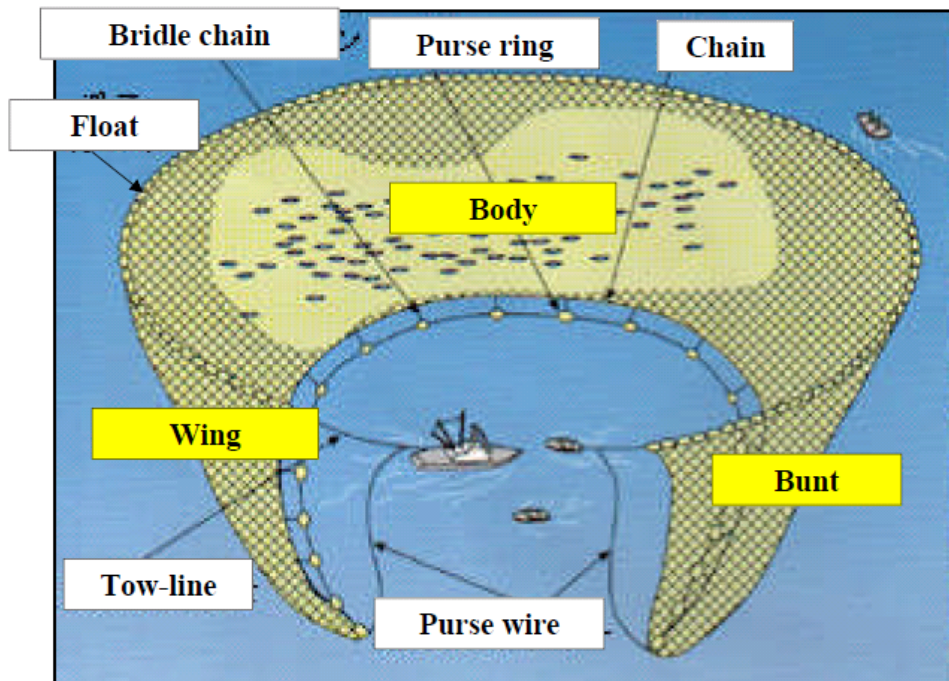
Fig. 3: The structure of purse seining net

Table 2: The juvenile bigeye tuna by-catch rate by mesh size (operation in 2006)

	Large mesh vessels	Non large mesh vessels
Number of vessels	9	28
Total catch (mt)	46,902	141,133
Total catch of juvenile bigeye (mt)	45	321
Juvenile bigeye by-catch rate (%)	0.10	0.23