



Preliminary analysis of catch at size for
Pacific bluefin tuna, *Thunnus orientalis*, landed by
Other fishery (Fleet 10)¹

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Introduction

In Tsugaru Strait and its adjacent areas (hereafter called Tsugaru area), a variety of small scale fisheries catch Pacific bluefin tuna (PBF) during the seasons between the late summer and the early winter. Troll, hand line and longline fisheries as well as set net fishery account for majority of the catch in these areas. Especially, handline and small scaled longline fisheries are major fishery there. These fisheries operated in Tsugaru Strait targets large PBF between summer to winter (Yamada *et al.* 2007). The PBF caught in Tsugaru area yield high-economic value.

In the current stock assessment of the PBF using the Stock Synthesis 3 (SS3), the troll and longline fisheries in Tsugaru areas are categorized into “*other fisheries fleet* (Fleet 10)” (Abe *et al.* 2007), and the Set net fishery in Tsugaru Strait is categorized into “*set net fisheries fleet* (Fleet 6)”. In current SS3 model, length distribution for Fleet10 was created from aggregating individual length measurement data. However, length measurement data and amount of catch collected in Tsugaru area have not been analyzed in details. Therefore, this document summarized present available size data sampled from fisheries operated in Tsugaru area and reviewed quantity and quality of the data in detail s .

Materials and Methods

The Research program on Japanese Bluefin tuna (RJB) has been conducted by National Research Institute of Far Seas for the purpose of collecting the information of landing data, size data and biological samples of the PBF caught by Japanese coastal and offshore fisheries. A total of 22 prefectural fisheries experimental stations have collected catch data in weight and number of fish by month (even by day since 2007), gear, market size category and processed status of fish (whole fish or processed) at the local markets based on the sales slips. The size and amount of catch have been collected through this project since 1992 as feasibility study and from 1994 in full scale survey. As size data, either or both of fork length and weight of individual fish are recorded and collected.

Location of the main landing ports in Tsugaru area is shown in Fig.

1. In these ports, fork lengths of a part of PBF landings were measured to the closest 1 cm intervals through the RJB program. In addition, individual weights obtained from sales slips were recorded. There are three types of size data obtained in Tsugaru area: individual length data; individual weight data; individual length and weight data. Coverage rate of fish of which weight was recorded attained 100% in many years owing to utilization of the sales slips (Table 1 and 2). The sale slips included individual weight with unit of 0.1 kg, 0.5 kg or 1 kg. Consequently, weight frequency distributions were created with weight class of 1 kg interval.

Results and Discussion

Weight and length frequency by year were shown in Fig. 2. In the length frequencies, there were a large number of PBF of the length classes larger than 50cm, In contrast, obvious mode of in weight frequencies appeared at the weight class smaller than 8 kg corresponding to 50cm in FL. There was inconsistency in positions and presence/absence of modes between the length and the weight frequency distributions. Such inconsistency seems to be caused by measuring more of the larger fish since it is easier. Length data did not have so high coverage rate for the total landing in number, whereas weight of PBF landed were recorded well in most of ports in Tsugaru area. Consequently, the weight frequency distributions are considered to be more reliable than the length frequency distributions and do not need to be raised to total catch because of high coverage rates. We highly recommend that the weight frequency distributions are used as the size data for Fleet 10 at the next stock assessment.

Reference

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Document #06.

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Table 1. Number of fish weighed and measured and those coverage rates for annual catch in number.

year	Weight										Length					Both			
	fukaura	fukushimayoshoka	furubira	iwasaki	matsumae	minmaya	ooma	shiranaki	toi	fukaura	matsumae	minmaya	ooma	toi	fukaura	matsumae	minmaya	ooma	toi
1994	1231			38	73	262	73					73				73			
1995	154			4	184	379	214					184				184			113
1996	322			8	222	206	704					218				218			
1997	1187			4		3	1104							411				411	
1998	498				79		808					79		203		79		203	
1999	1166	25		16	417	5	1807		562					281				281	
2000	1062	509		54	427	1006	567		1298										
2001	1735	176		38	1090	1679	961		1386										
2002	2113	1083	12	799	1024		2212		1031										
2003	1856	2755		851	4430	1171	677	3	654	180		899	143		180		899	143	
2004	680	1848		685	6002	2007	2522		1485	83	123	1931	816		83	123	1931	816	
2005	3013	3178		4069	8208	1555	2189		1474	214	230	1519	454		214	230	1519	454	
2006	2201	1282		3143	3739	1713	1913		907	118	32	1689	487		118	32	1689	487	
2007	951	1915			10244	51	2521		1924	292	5122	42	1335	158	292	5122	42	1335	158
2008	409	1437			14834	1838	1880		132	69	5341	1791	926	133	69	5341	1791	926	133
2009	538	1401	18		12149	1339	1301		412		2339	1315	1176	79		2339	1315	1176	79
2010	10	800			7360	1176	1460		750	10	1129	1160	1439	183	10	1129	1160	1438	183

Table 2. Coverage of number caught by other fishery(%).

year	Weight										Length				Both					
	fukaura	fukushimayoshoka	furubira	iwasaki	matsumae	minmaya	ooma	shiranaki	toi		fukaura	matsumae	minmaya	ooma	toi	fukaura	matsumae	minmaya	ooma	toi
1994	100			100	4		100						11				4			
1995	61			100	4		100						18				4			53
1996	100			100	3	100	100						10				3			
1997	100			100		100	100													37
1998	100				3		100						15				3			25
1999	100	35			88	100	100		100											16
2000	46	100		100	100	100	100		100											
2001	100	64		100	100	100	100		100											
2002	100	100	100	100	101	0	100		100											
2003	99	100		100	101	100	100	100	100							10				
2004	110	100		100	100	100	100		100				7	96	32	13	2			21
2005	100	100		98	100	100	100		100				7	98	21	7	3			
2006	100	100		100	100	100	100		38				5	2	99	25	5	1		25
2007	100	100			100	3	100		100				31	100	2	31	100	2		54
2008	100	100			100	100	100		43				17	56	97	49	17	56		43
2009	47	100	100		100	100	100		100				0	24	98	94	0	24		94
2010	36	100			100	100	46		100				36	18	99	46	36	18		32

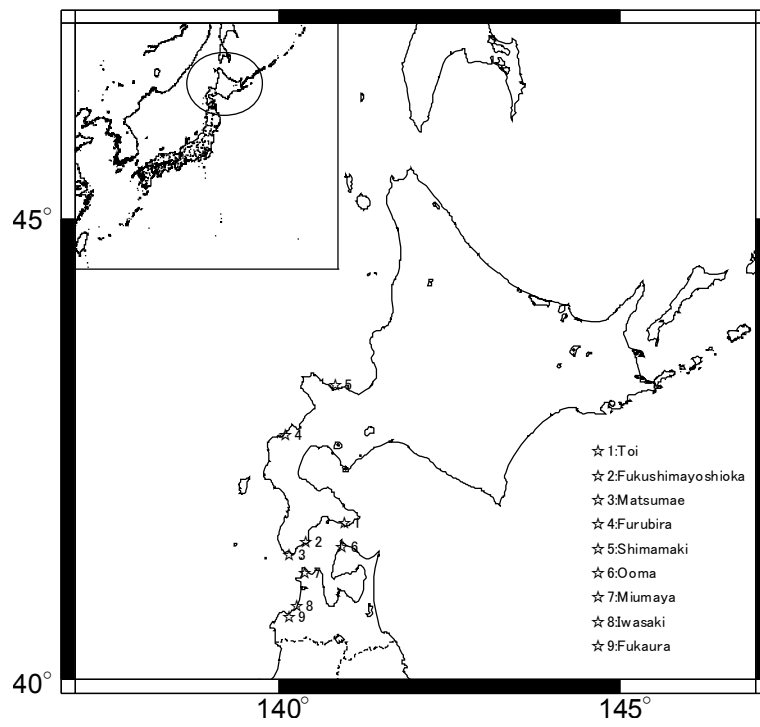


Fig. 1. Operation sea area around the Tsugaru Strait by RJB.

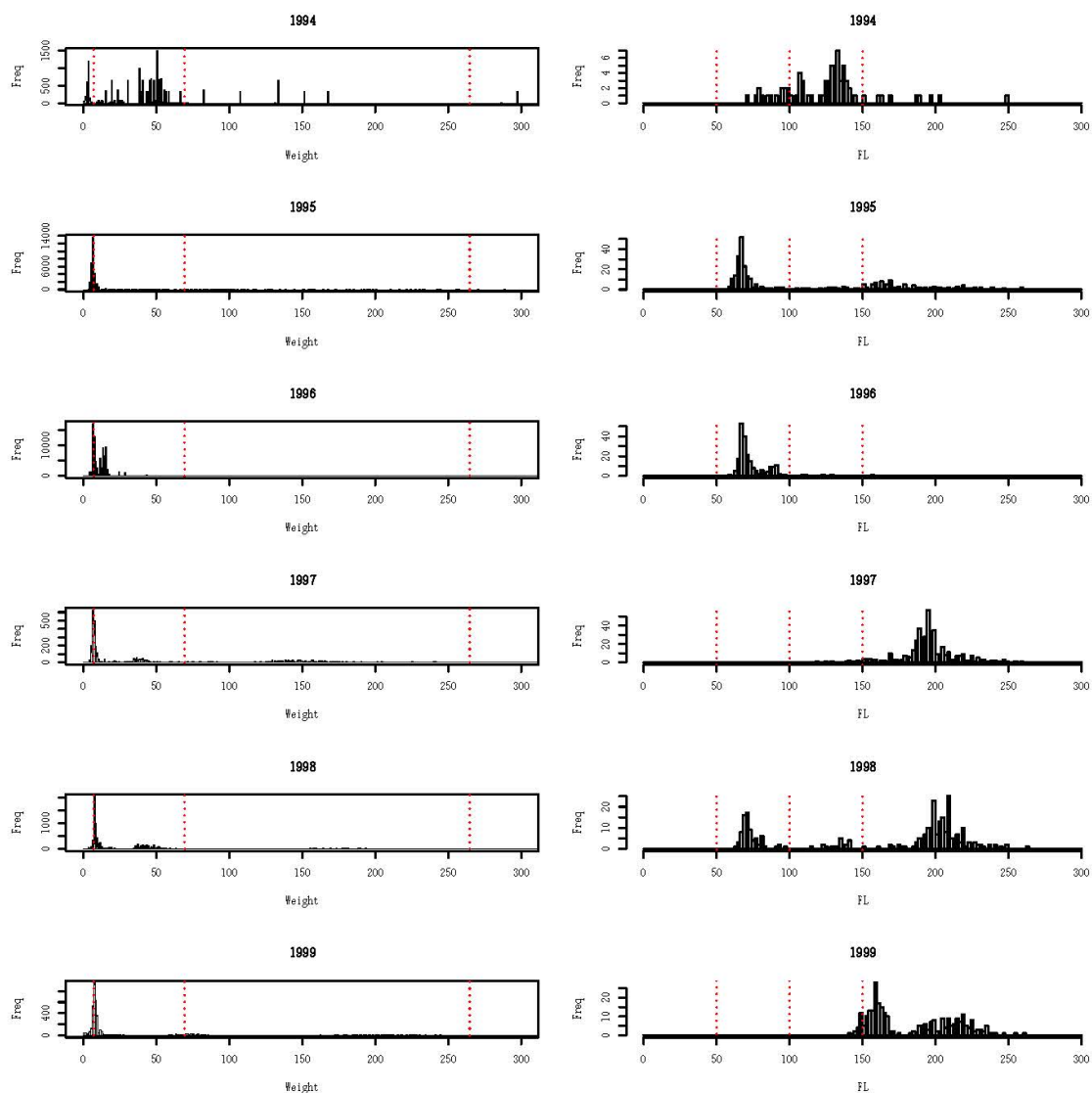
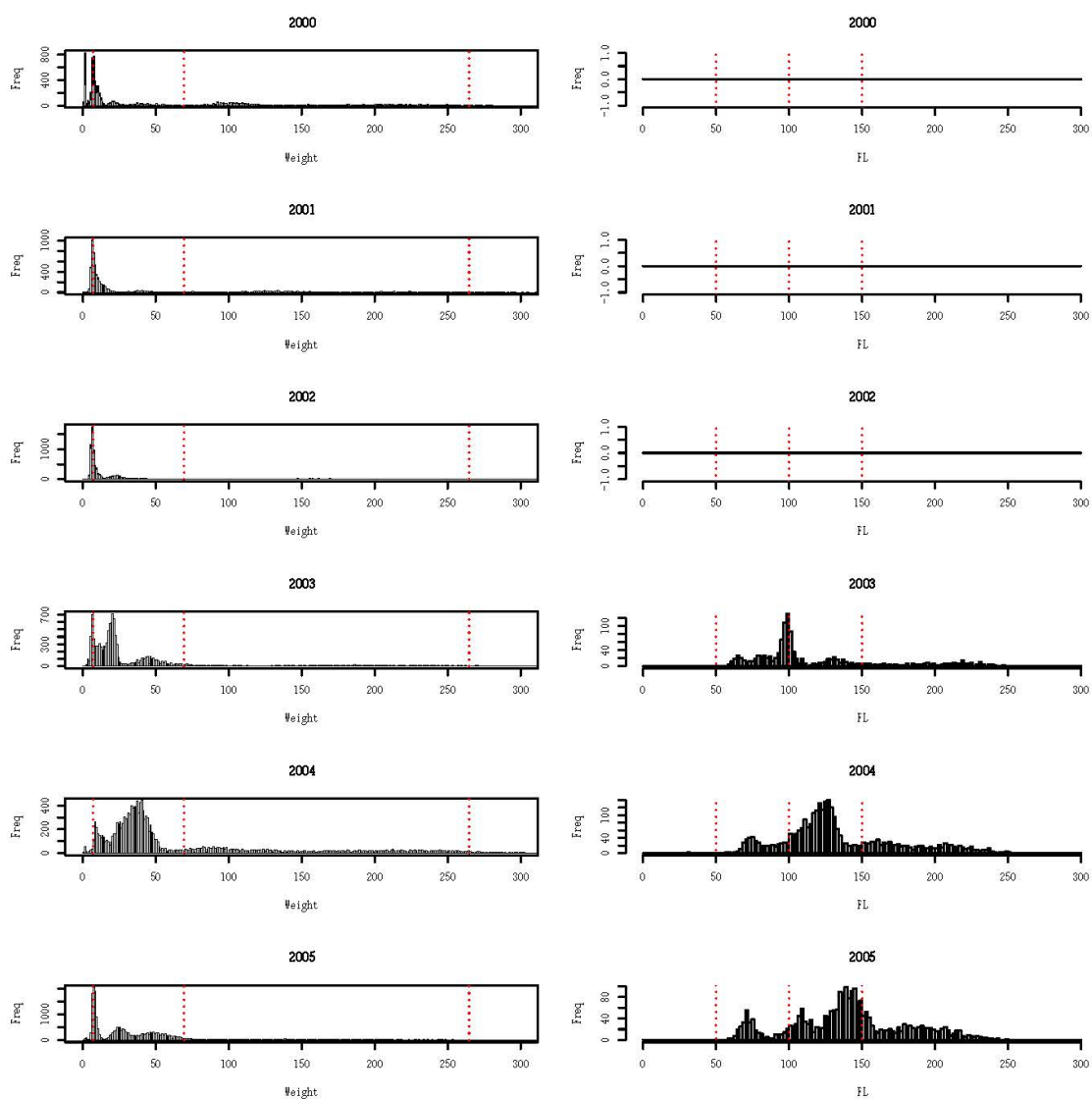
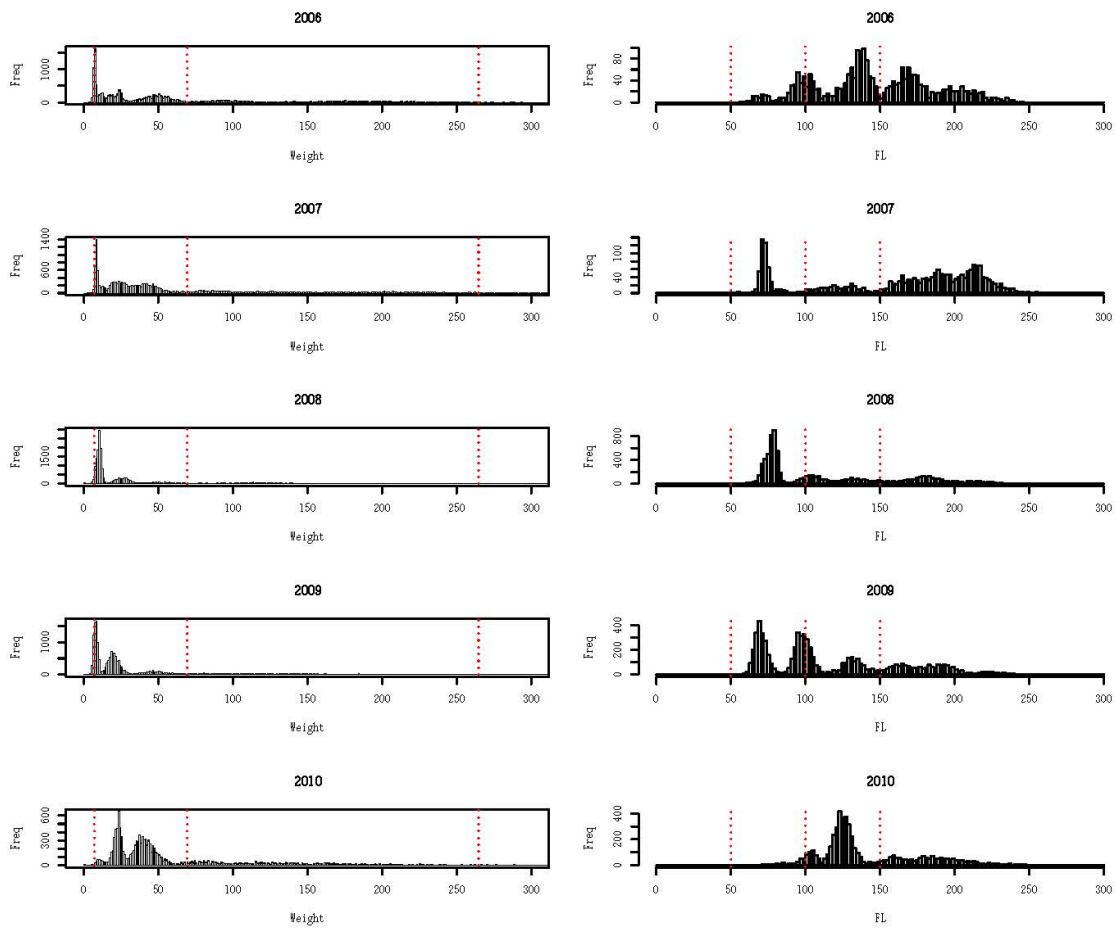


Fig. 2. Yearly weight and length frequency distribution of Pacific Bluefin tuna landed at Tsugaru area. Dotted vertical lines indicate the weight corresponding to 50,100 and 150cmFL.

Fig. 2. *Continued.*

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