South Pacific Regional Fisheries Management Organisation

1st Meeting of the Scientific Committee

La Jolla, United States of America, 21-27 October 2013

SC-01-07

2013 Korea Annual Report

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National report of Korea to 1st Scientific Committee of SPRFMO

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1. Description of the fishery

Jack mackerel fishery

Korean research trawl fishery targeting for jack mackerel was commenced in 2003 using the R/V Tamgu No. 1 and two commercial mid-water trawl vessels. Since then the Korean commercial fishery for jack mackerel has operated in the fishing ground of outside EEZ until recent years. The number of active fishing vessels was 1~3 in 2004-2013 (Table 1).

Table 1. Number of vessels and size for jack mackerel fishery in the SPRFMO area

Years	Number of vessels	Gross registered Tonnage			
		2,000-2,999	3,000-3,999	4,000-4,999	5000<
2004	3	1	1	1	-
2005	2	1	1	-	-
2006	3	1	1	1	-
2007	3	1	1	1	-
2008	3	1	1	1	-
2009	2	-	1	1	-
2010	2	-	1	-	1
2011	2	-	1	-	1
2012	2	-	1	-	1
2013	1	-	1	-	-

Bottom fishery

Korean bottom trawl fishery for Orange roughy was operated in high seas with 1-2 vessels during 2004-2007. There was no bottom trawl fishery in the SPRFMO area since 2008 (Table 2).

Table 2. Number of vessels and size for bottom fishery in the SPRFMO area

Years	Number of vessels	Gross registered Tonnage		
		600-699	700-799	800-899
2004	2	1	-	1
2005	-	-	-	-
2006	1	-	-	1
2007	1	-	-	1
2008	-	-	-	-

2. Catch, effort and CPUE summaries

Catches by species for jack mackerel fishery

Annual catches of jack mackerel and other species from 2004 to 2012 are summarized in Table 3 and in Figure 1. In 2009, the catch was a peak with about 15 thousand tons. From 2010 to 2012, two Korean trawlers were operated in the SPRFMO area and caught individually 8,183 ton, 9,253 ton, 5,492 ton. In 2012, two trawlers were operated but one vessel only caught and it had no bycatch.

Table 3. Catch by species for jack mackerel fishery in the SPRFMO area

Years	Number of fishing days	Total Catches (ton)	Catches (ton)		
			Trachurus murphyi	*Scomber japonicus*	Others
2004	205	8,146	7,438	708	-
2005	170	9,507	9,126	381	-
2006	232	11,934	10,474	1,460	-
2007	237	12,180	10,940	1,240	-
2008	249	13,568	12,600	968	-
2009	182	14,534	13,759	716	59
2010	136	8,267	8,183	84	-
2011	205	9,377	9,253	24	100
2012	117	5,492	5,492	-	-

CPUE(ton/hr) of jack mackerel present at the range of 4 to 6, the highest value of CPUE was 10.5 in 2009, a total of catch was 13,759 ton(Figure 1). In 2012, CPUE was 6.0.

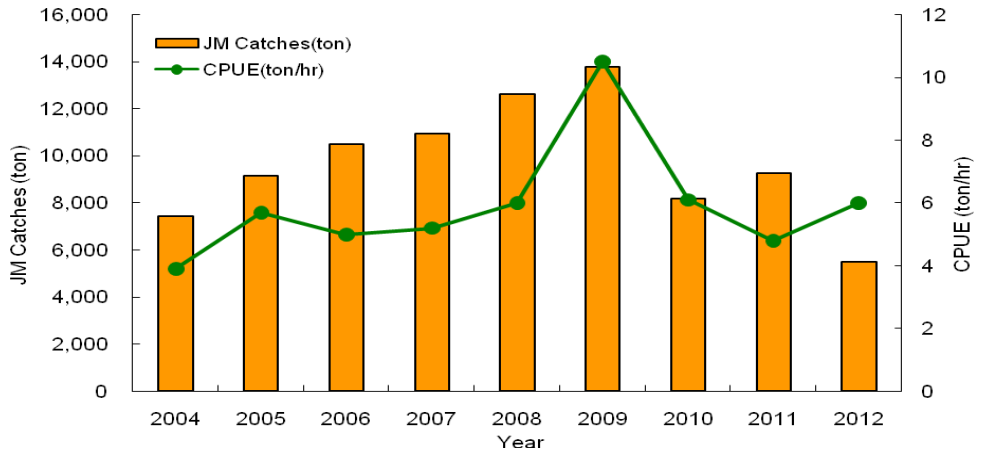

Figure 1. Trends of catch and catch per unit effort (ton/hr) of jack mackerel in the SPRFMO area from 2004 to 2012.

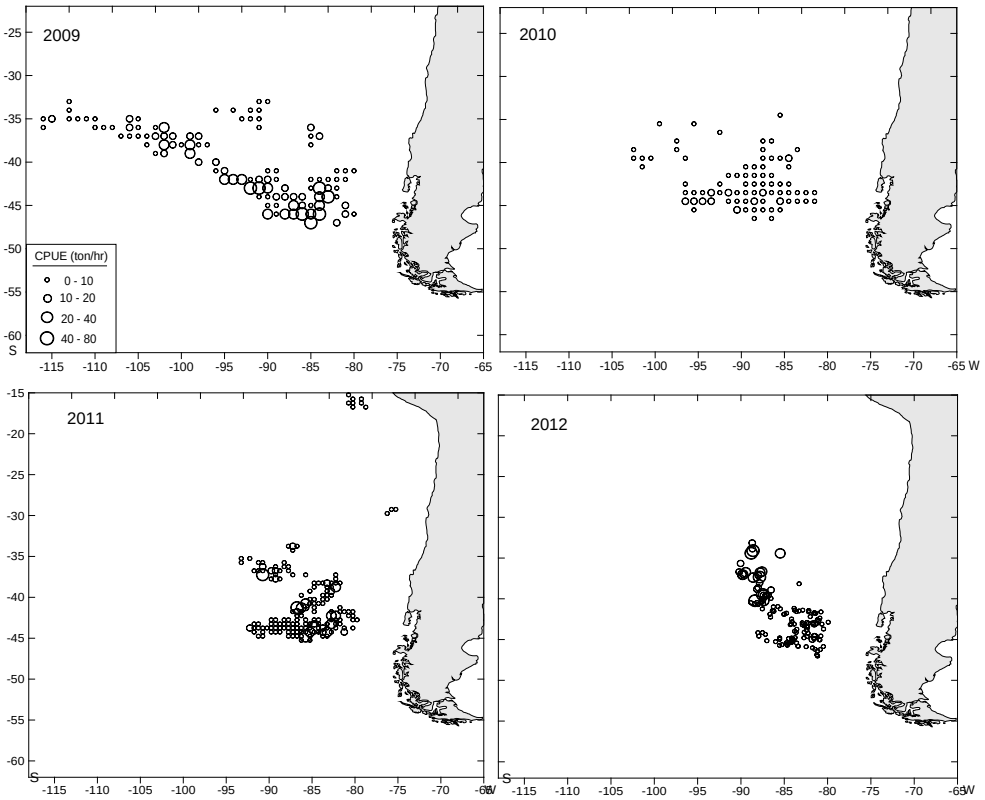

Figure 2. Distribution of CPUE(ton/hour) of jack mackerel in the SPRFMO area in 2009-2012.

Geographical distributions of the CPUE of jack mackerel from 2009 to 2012 are shown in Figure 2. In 2009, a total of catch of jack mackerel was the highest and the distribution of jack mackerel was also the widest. Fishing operation for jack mackerel established mainly March to August. Main fishing ground was the range of 35°~45°S in Latitude and 80°~95°W in Longitude. Fishing ground became narrower since in 2009.

Catches by species for bottom fishery

Table 4 represents total annual catches and fishing effort (number of fishing days) for the Korean bottom trawl fishery during 2001-2007 in the SPRFMO area. The catch of the bottom trawl fishery including orange roughy increased over 2001-2003, and it decreased over 2004-2007 shown the lowest in 2007(Figure 3).

Table 4. Annual catches for bottom fishery in the SPRFMO area

Years	Number of fishing days	Catches (ton)	Orange roughy (ton)	Others
2001	?	101.4	93.3	8.1
2002	?	225.0	207.8	17.2
2003	?	266.5	243.3	23.2
2004	51	143.8	137.9	5.9
2005	-	-	-	-
2006	32	83.1	77.2	5.9
2007	29	48.8	44.2	4.4

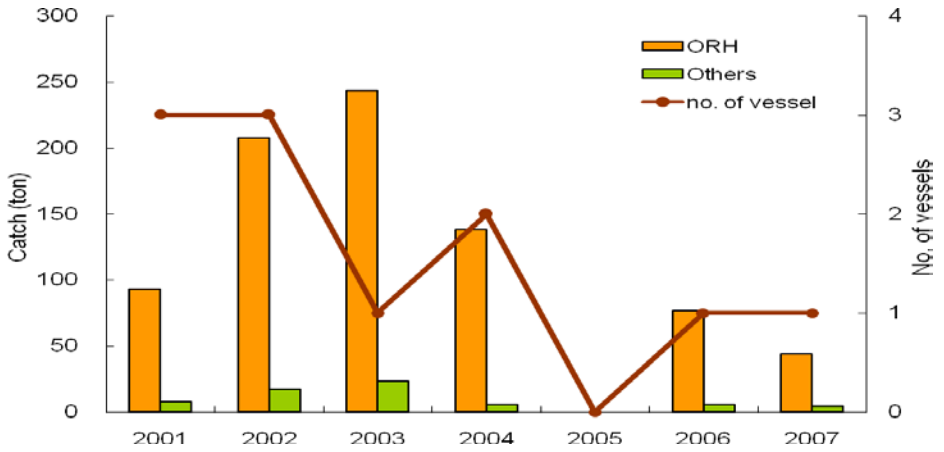

Figure 3. Trends in annual catch of orange roughy and number of fishing vessels by Korean bottom trawl fishery in the SPRFMO area in 2001-2007.

3. Fisheries data collection

Official catches by distant-water fishery is obtained by two organizations. Korea Overseas Association (KOFA) collects total catches by gear type from Korean distant-water fishery industries, which are used as Korean official total catch. National Fisheries Research and Development Institute (NFRDI) collect logbook data from sampled fishing vessels. The logbook contains daily catch and effort data on the basis of tow-by-tow.

Data collection from the vessel

Each commercial vessel of distant-water fisheries submits the "Catch Report and Biological Report (logbook)" which are recorded on board of fishing vessels according to the domestic regulation on the tow-by-tow basis. The logbook and catch data have been submitted to the SPRFMO Secretariat in accordance with the data standards of SPRFMO.

Data collection by observer at the sea

For the analysis of the biological characteristics for jack mackerel, an observer has been collected fork length, body weight, by sex and reproduction indices from the commercial vessels.

In 2008, two Korean vessels operated in the SPRFMO area and one observer was deployed for 9 days. The coverage rate of observation was 4 %. And also Korean vessels operated in 2010, but no observer was deployed on these trips. In 2011, one observer embarked on one vessel from August 15 to September 5, and the coverage rate of observation was 6.8 %. In 2012, one observer operated on one vessel from April 22 to July 28, and the coverage rate of observation was 58.1% (Table 5).

Table 5. Dispatch of scientific observer in 2008, 2011 and 2012 in the SPRFMO area

Date	Vessel name	observed days	Coverage rate (%, tows)
2008. 10	Insungho	3	4
	Kwangjaho	6	
2011. 8-9	Kwangjaho	14	6.8
2012.4-7	Kwangjaho	68	58.1

4. Biological sampling and length composition of Chilean jack mackerel

In October 2008, a total of 344 jack mackerel was measured. The range of fork length was 32cm to 49cm and the average was 37.8 cm. There was only one group with one mode at 38cm (Fig. 4). The relationship equation between body weight (g) and fork length (cm) was $BW=0.073FL^{2.46}$ ($R^2=0.876$, Fig.5).

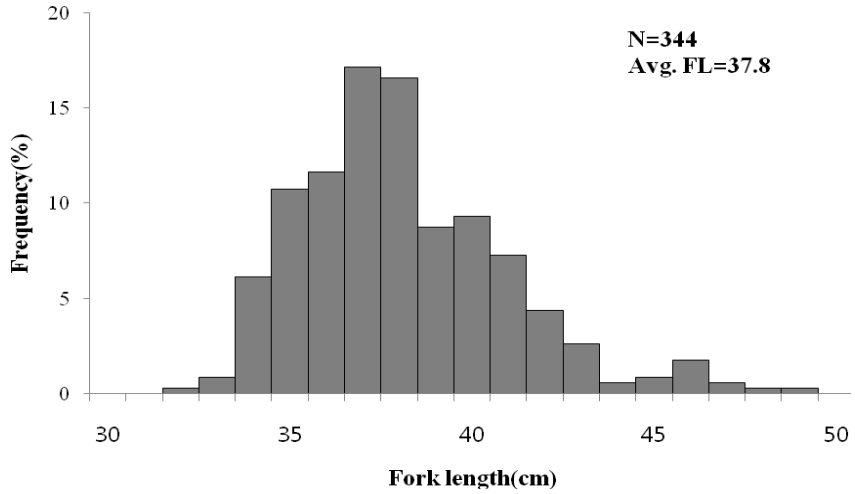

Figure 4. Frequency of fork length of jack mackerel caught in October 2008.

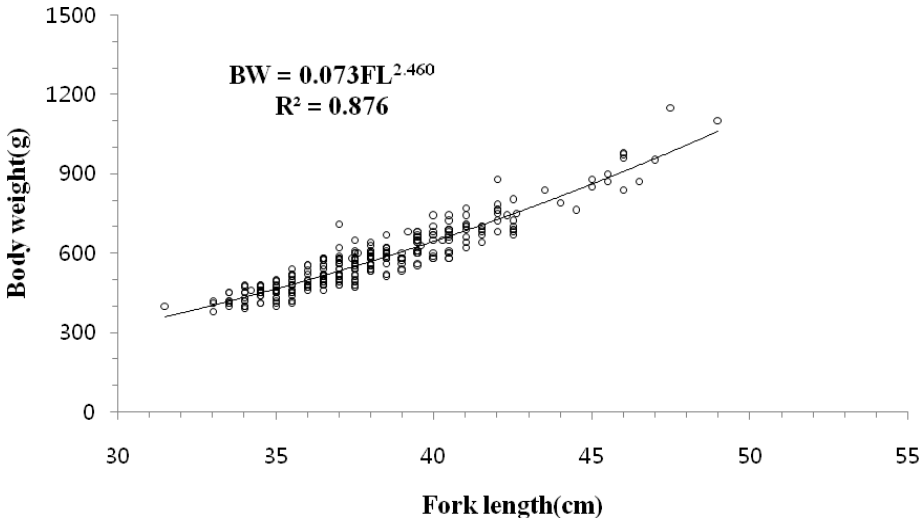

Figure 5. Relationship equation between body weight and fork length of jack mackerel caught in October 2008

In August and September 2011, a total of 2,450 jack mackerel was measured. The range of fork length was 28 cm to 69 cm and the average was 45.6 cm. There were two separate groups with two modes at the 33 cm and 45 cm, respectively. The small group in the smaller length seemed like a new recruitment (Fig. 6). The relationship equation between body weight (g) and fork length (cm) was $BW=0.02FL^{2.76}$(R^2=0.949, Fig. 7).

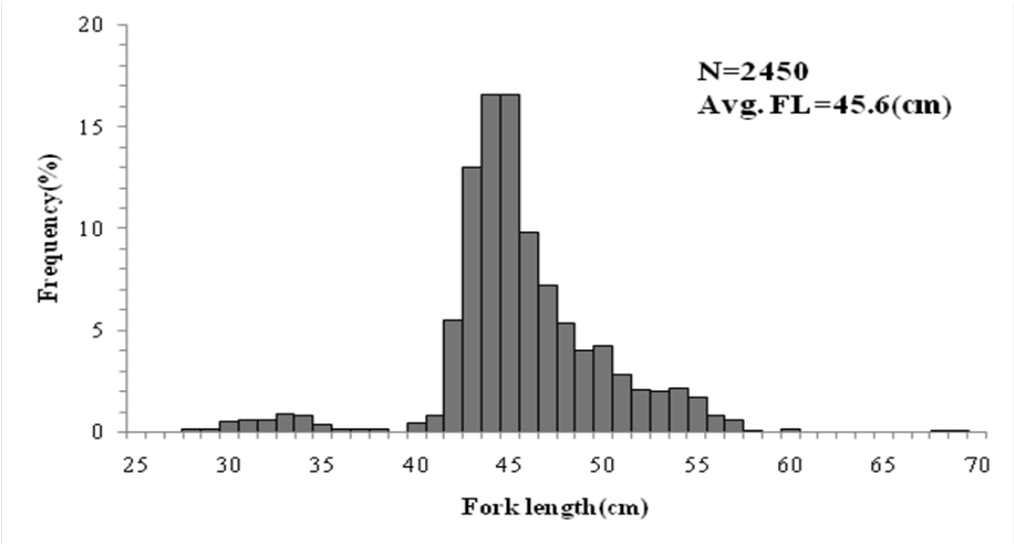

Figure 6. Frequency of fork length of jack mackerel caught in August-September 2011.

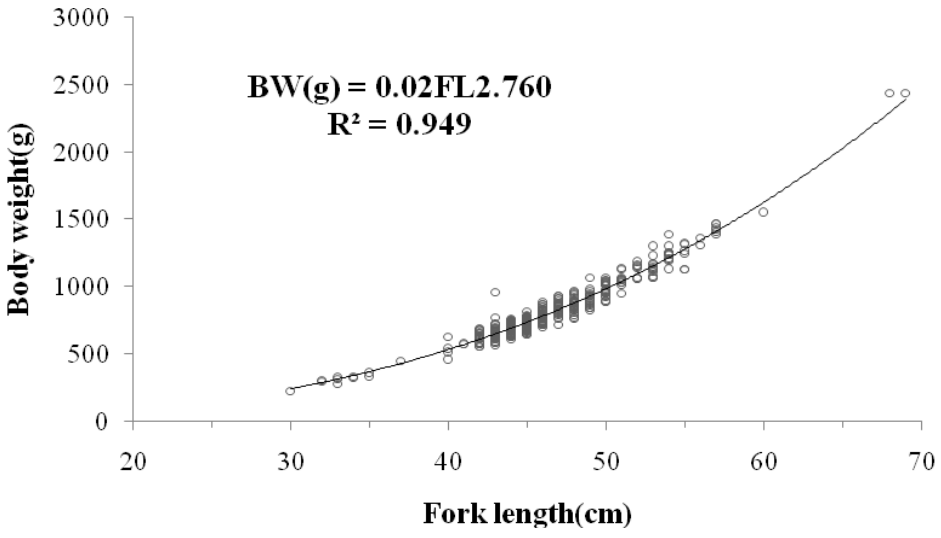

Figure 7. Relationship equation between body weight and fork length of jack mackerel caught in August-September 2011.

In April to July 2012, a total of 9,789 jack mackerel was measured. The range of fork length(FL) was 31 cm to 60 cm and the average FL was 48.6 cm. There was only one group with one mode at 48cm (Fig. 8). The relationship equation between body weight (g) and fork length (cm) was $BW=0.016FL^{2.820}$(R^2=0.924, Fig. 9).

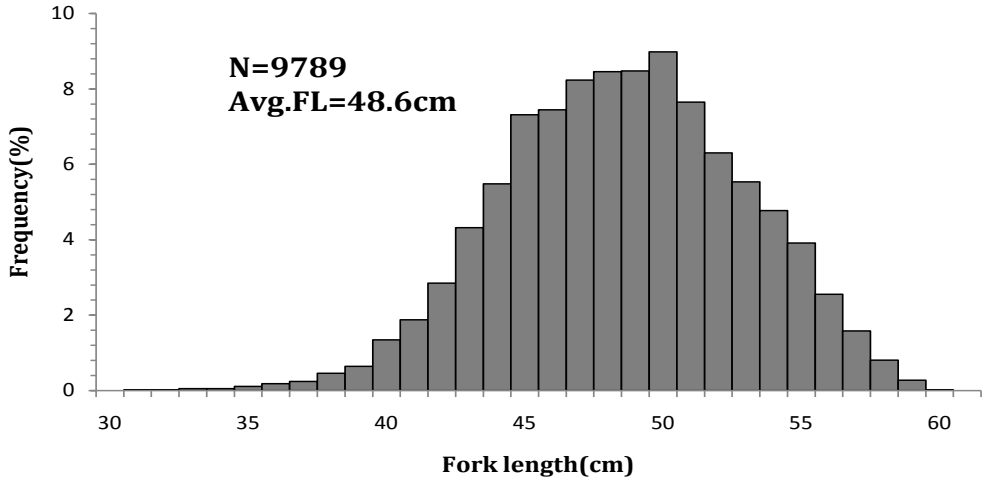

Figure 8. Frequency of fork length of Chilean jack mackerel caught in April to July 2012.

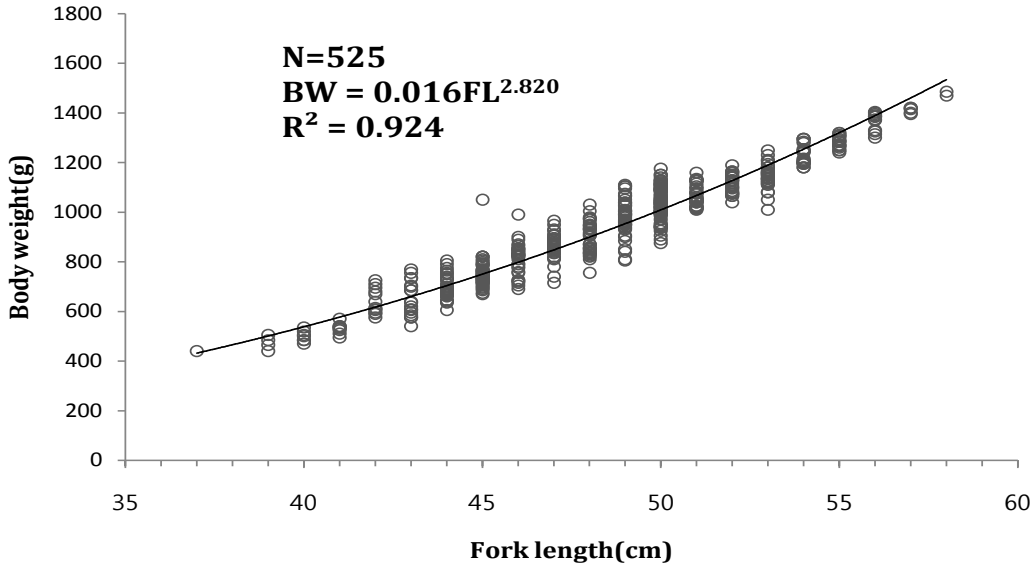

Figure 9. Relationship equation between body weight and fork length of Chilean jack mackerel caught in 2012.