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Chinese Taipei's Annual Report

2014 National Report of Chinese Taipei to SPRFMO Scientific Committee on the Squid Jigging Fishery in the Southeast Pacific Ocean

1. Description of the Fishery

Jumbo flying squid, or Humboldt squid, (*Dosidicus gigas*) is a large pelagic squid and distributes in the eastern Pacific Ocean reaching 50° for both North and South regions. This species has been targeted by the distant-water squid-jigging vessels of Chinese Taipei in the Southeast Pacific (SEP) since 2002. The number of vessels of the fishery varied between 9 and 29 from 2002 to 2013 (Fig. 1). The number of vessels decreased in recent three years, from 21 in 2011 to 9 in 2013, due to the fact that part of the vessels moved to other waters for operation.

The number of operating fishing vessels of the distant-water squid fishery of Chinese Taipei in the SEP varied monthly from 2008 to 2013 (Fig. 2). The monthly number of operating vessels was lowest in 2013, ranged from 1 to 6. However, no significant movement of the vessels was found for 2013.

The monthly fishing days (vessel-day) deployed by the distant-water squid fishery of Chinese Taipei in the SEP in 2013 varied between 26 and 154 days (Fig. 3). The fishing days were greater from May to July (>140 days), while smaller in February, September and December (<40 days).

2. Catch, Effort and CPUE Summaries

The annual catch and effort information of the distant-water squid fishery of Chinese Taipei in the SEP from 2008 to 2013 were shown in Table 1. During this period, catch of Jumbo flying squid declined to 7,759 tons in 2013 along with the decrease in the number of vessels and fishing days. No bycatch was recorded in the retrieved logbooks. This may

be a result of performing a highly selective fishing gear (jigging) on squids for the fishing vessels in this regions.

The annual nominal CPUE (tons/vessel-day) for the distant-water squid fishery of Chinese Taipei in the SEP from 2008 to 2013 was shown in Figure 4. The nominal CPUE in 2013 was 7.4 tons/vessel-day, a slight rebound from the lowest level of 6.4 tons/vessel-day in 2012, but lower than the long-term (from 2008 to 2013) annual average value (9 tons/day).

Spatial distribution of average CPUE (tons/vessel-day) of distant-water squid fishery of Chinese Taipei in the SEP from 2008 to 2013 were shown in Figure 5. The major fishing grounds for the fishery were located at around 75–85°W and 5–30°S. There were a few vessels operating within the EEZ of Peru between 2008 and 2010 under the permission of fishing licenses issued by the competent authority of Peru. The fishing fleet operated in the high seas of the SEP from 2011 to 2013.

3. Fishery Data Collection and Research Activities

3.1 Logbook system

The fishermen of distant-water squid fishery of Chinese Taipei are required to maintain fishing logbooks on a daily basis. All the logbooks of the vessels operating in the SEP have been retrieved. In addition, the vessels of distant-water squid fishery were required to submit their daily catch through e-logbook system since 2007.

3.2 Transshipment and landing data collection

In accordance with domestic regulations, relevant data on transshipment and landing conducted by the distant-water squid fishery of Chinese Taipei were collected by the competent authorities. These data have been submitted to the Secretariat of SPRFMO since 2013 as required respectively by CMM 1.03 and CMM 2.02 (Conservation and

Management Measure on Standards for the Collection, Reporting, Verification and Exchange of Data).

3.3 Research

Research on the abundance variation of jumbo flying squids was conducted. In recent years, research programs have been carried out on spatial distribution patterns, CPUE trend, stock status and exploitation rate of this species. The distribution of *D. gigas* abundance was higher in the coastal waters off northern Peru. The size composition harvested by Chinese Taipei's fleet was identified as large-size group in recent years. The results of GAM showed the temporal and spatial variables could explain higher variation of squid abundance than other variables. This may result from highly variable features of squid populations and high migration pattern of jumbo squid. A decreasing trend of squid abundance index was found since 2005 afterward.

4. Biological Sampling and Length/Age Composition of Catches

Items of the logbooks of distant-water squid fishery of Chinese Taipei encompassed the size composition (in commercial category) for catch of jumbo squid in the SEP. Four categories were recorded: A, <1 kg; B, 1-2 kg; C, >2 kg; and D, processed products (head, tube and fin). The weights of category D were calculated by weights of the processed products and adjusted by a ratio of weight of the viscera. The processed products encompassed various size categories of squids which were almost dominated by extra-large size (>2 kg) individuals. The annual size composition of jumbo squid for the fishery between 2008 and 2013 were shown in Table 2.

5. Summary of Observer and Port Sampling Program

Neither observer nor port sampling program is implemented for the distant-water squid fishery of Chinese Taipei in the SEP.

Table 1: Annual catch and fishing effort of Chinese Taipei's squid fishery in the Southeast Pacific between 2008 and 2013.

Year	2008	2009	2010	2011	2012	2013
No. of vessels	13	13	20	21	14	9
Fishing days	2,744	1,403	2,874	3,597	2,211	1,045
Catch(tons)	31,161	12,319	29,206	35,418	14,177	7,759

Table 2. Annual catch by size composition (in weight) of Chinese Taipei's squid fishery in the Southeast Pacific between 2008 and 2013. (Category: A, <1 kg; B, 1-2 kg; C, >2 kg; D, non-categorized)

Year	A	B	C	D	Total
2008	144	59	807	30,151	31,161
2009	80	0	0	12,239	12,319
2010	163	7	0	29,036	29,206
2011	57	3	3	35,356	35,418
2012	1,485	138	81	12,472	14,177
2013	205	0	12	7,542	7,759

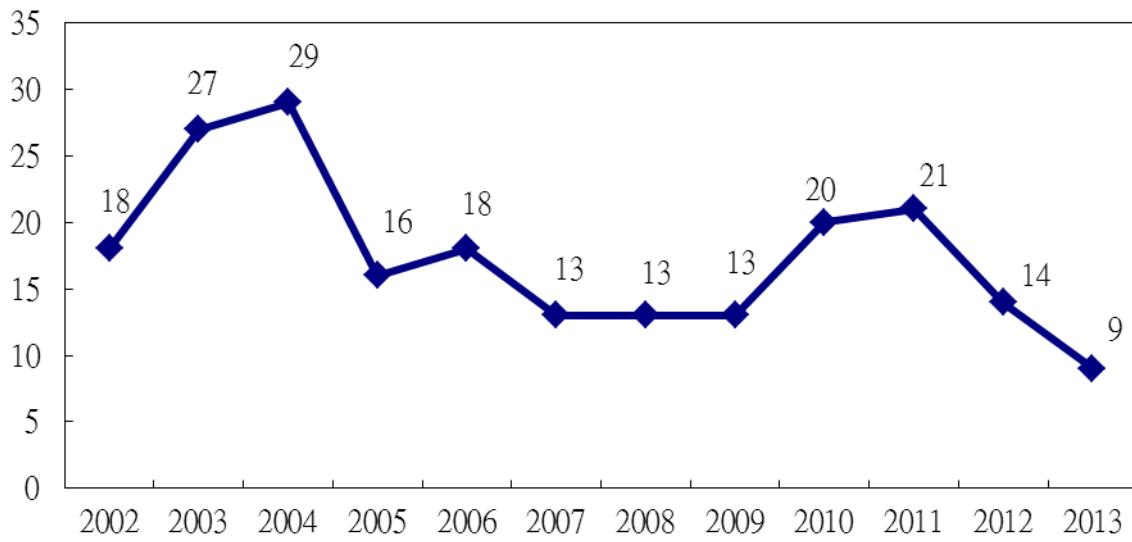


Figure 1: Annual variation in number of vessel for distant-water squid fishery of Chinese Taipei in the Southeast Pacific from 2002 to 2013.

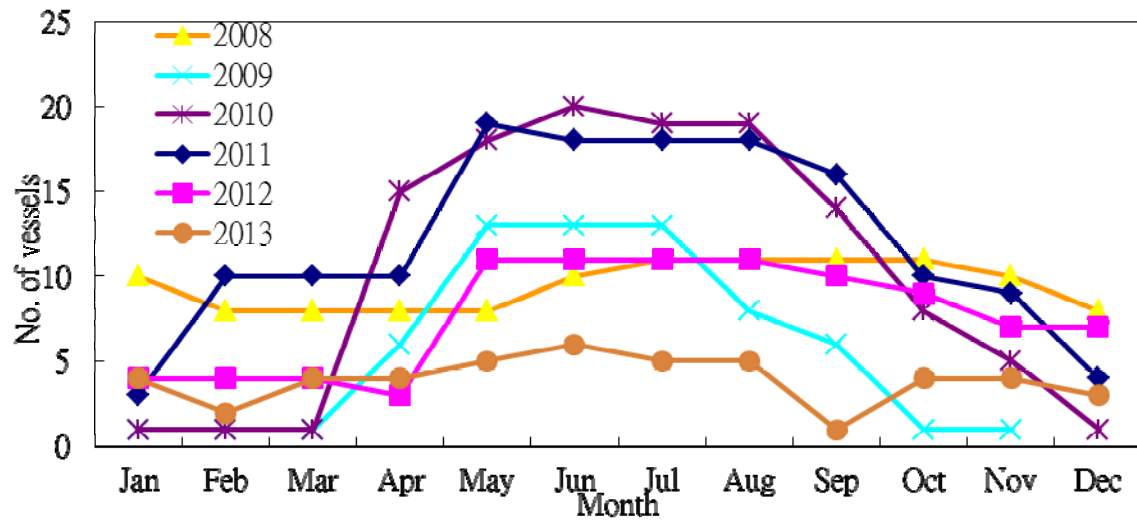


Figure 2: Monthly variation in number of operating vessels for distant-water squid fishery of Chinese Taipei in the Southeast Pacific from 2008 to 2013.

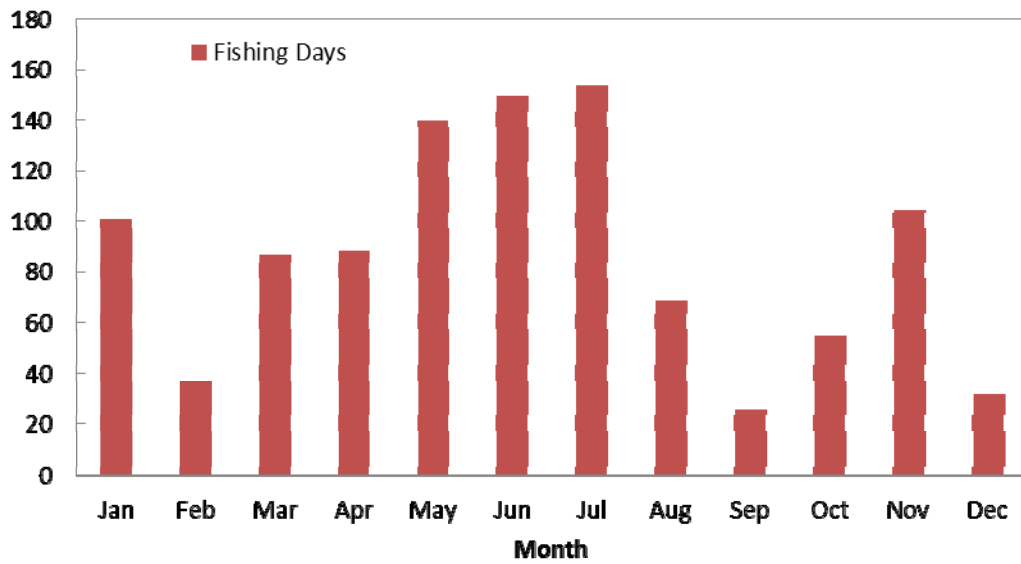


Figure 3: Monthly fishing days deployed by the distant-water squid fishery of Chinese Taipei in the Southeast Pacific in 2013.

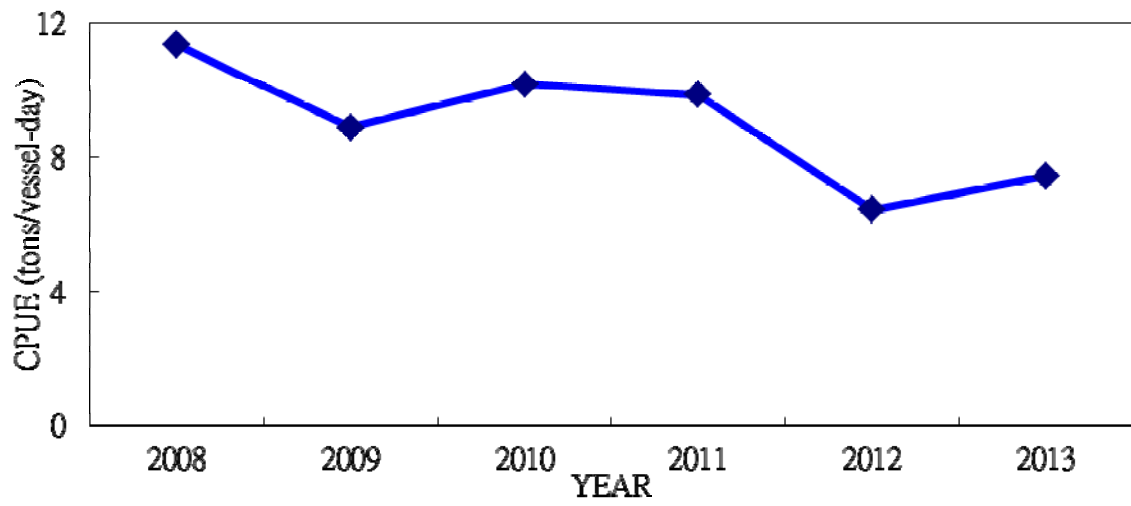


Figure 4: Annual nominal CPUE of the distant-water squid fishery of Chinese Taipei in the Southeast Pacific between 2008 and 2013.

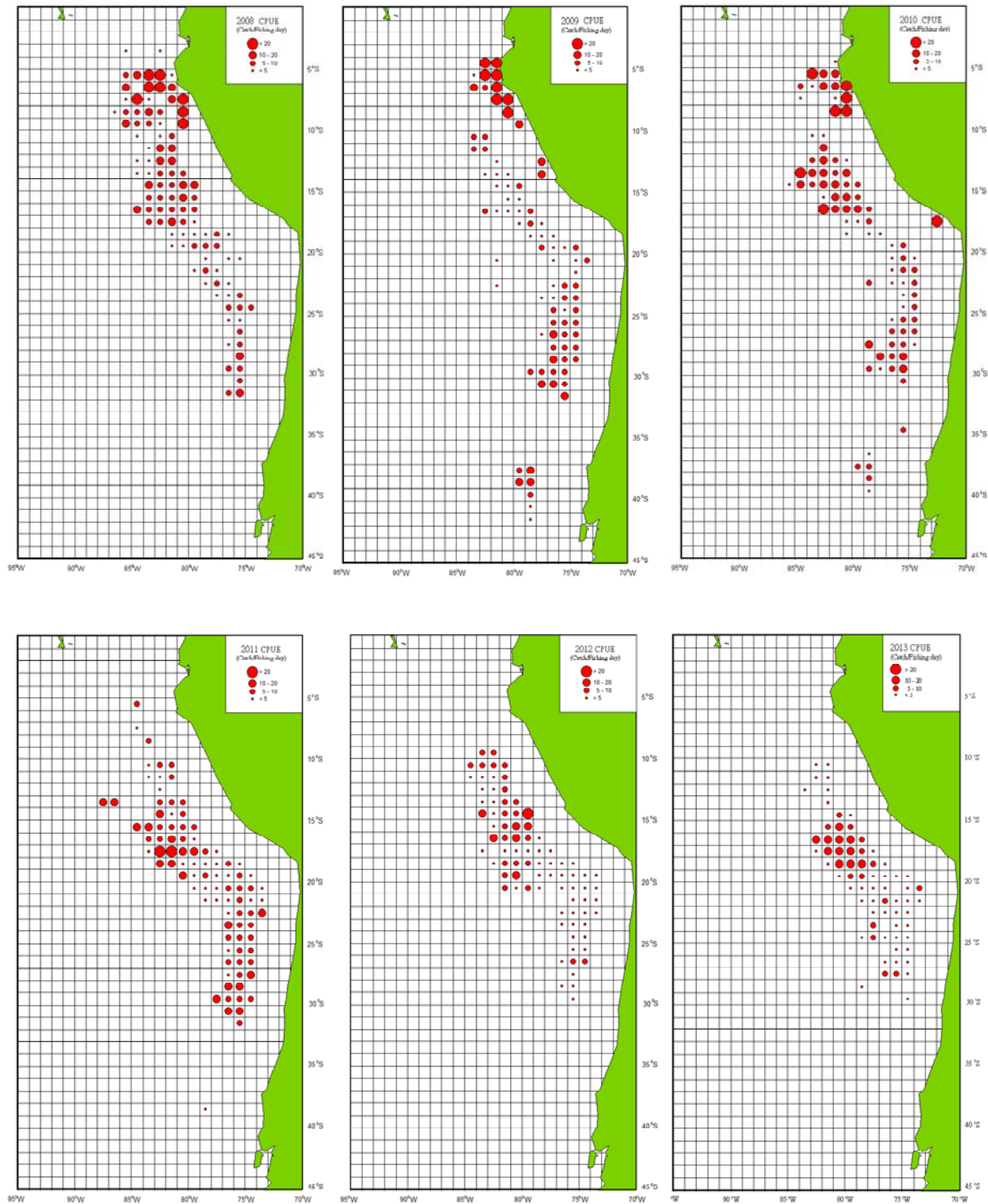


Figure 5: Spatial distribution of annual average CPUE of squid fishery of Chinese Taipei in the Southeast Pacific Ocean from 2008 to 2013.