

## CATCH PERFORMANCE OF FISHING GEARS FOR NERITIC TUNA IN INDIAN OCEAN BASED ON PALABUHANRATU FISHING PORT

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### ABSTRACT

Neritic tuna species landed in South Java Indian Ocean were caught by gill net, danish seine, purse seine and troll line. The pelagic danish seine contributed about 77 % of its neritic tuna catch in Palabuhanratu south of west Java. The fish species consisted of Kawakawa (*Euthynnus affinis* (Cantor 1849)), longtail tuna (*Thunnus tonggol* (Bleeker, 1851)), and bullet tuna (*Auxis rochei* (Risso, 1810)). Landing statistical data in last 2 years indicated that most of the catch consisted of bullet tuna. The peak season occurred during SE monsoon from June to November. Annual catch of neritic tuna based on national and Palabuhanratu fishing port statistical data shows an increasing trend. The estimate CPUE of purse seine tend increasing significantly in last two years. Using CPUE result Neritic tuna resources in South Java water still at the sustainable level.

**Keyword** : Indian Ocean, Palabuhanratu Fishing Port, CPUE, Neritic tuna

### INTRODUCTION

Neritic tuna fisheries in Indonesia already exist since early 1960's and being recorded in national level since 1974 after having support from FAO. Fishing occurred in the coastal and expand to more offshore waters. Eastern Indian Ocean is one of the productive waters for tuna and tuna like fisheries in the country. Marine fisheries capture fisheries data of Indian Ocean which geographically located in south and western part of Indonesian waters can be divided in two Indonesian Fisheries Management Area (IFMA) i.e., West coast of Sumatera (IFMA 572), South Java, Bali and NusaTenggara (IFMA 573) (Mininsterial Regulation No. 01/MEN/2009) . In South Java coast, the neritic tuna caught by several fishing gear and landed in three major fishing port i.e Palabuhanratu, Cilacap, and Prigi. Palabuhanratu as one of the main landing place

that play a significant role on fishing activities. Several types of fishing gears that operated for catching neritic tuna species. Those are: gill net, purse seine, troll line and pelagic danish seine.

Neritic tuna mostly caught as by catch by gill net, purse seine and troll line with their main target spesies are skipjack and yellowfin tuna whereas the most commercial spesies in the area. Among the fishing gears, only pelagic danish seine which caught neritic tuna mainly bullet and frigate tuna become their main target spesies. Purse seine and troll line mainly operated by using artificial FADs, and their fishing ground mainly in offshore waters in Indonesian EEZ , while gill net and danish seine usually operated in onshore waters close to the land. The preliminary analysis is carried out mainly based on the information from landing data of Palabuhan Ratu Fishing Port, Southern West Java.

## RESULT AND DISCUSSION

### Annual Catches of Neritics tuna

Annual Catches of Neritics tuna in South Java generally shows and increasing trend from 2005 with only 10702 tons to 24 241 tons in 2007, during 2007 to 2009 the annual catch seemed to be constant below 2 5000 ton. In 2010 the catch decreased, and the highest landing occurred in 2011 with eatimated production of 28 087 ton (Figure 1)

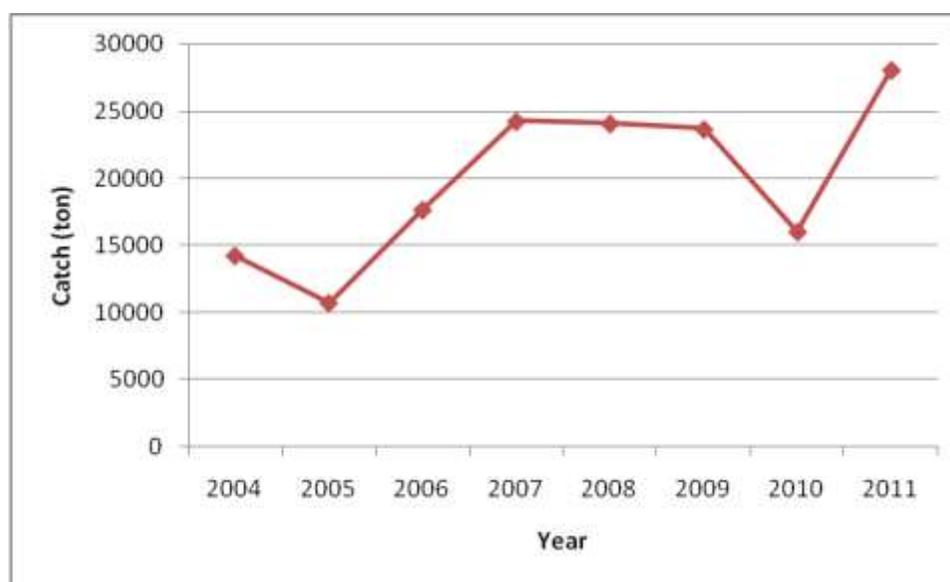


Figure 1. Annual catches of neritic tuna in the Indian Ocean South of Java (Source: *Capture Fisheries Statistics of Indonesia 2010* (DGCF, 2011)).

## Catches of Neritics Tuna in Palabuhanratu

Annual Catches of Neritics tuna in Palabuhanratu fishing port were varied among the years. Data From 2001 to 2012 shows that landing data ranged between 200 to 1100 tons annually. The highest occurred in 2006 and 2012, the lowest found in the year of 2010. A linear trend among the years indicated that the catch tend to increase with fluctuation in between.(Figure 1) A previous study informed that there are some correlation between the catch and shifting of primary productivity (Amri, *et al.*, 2012).

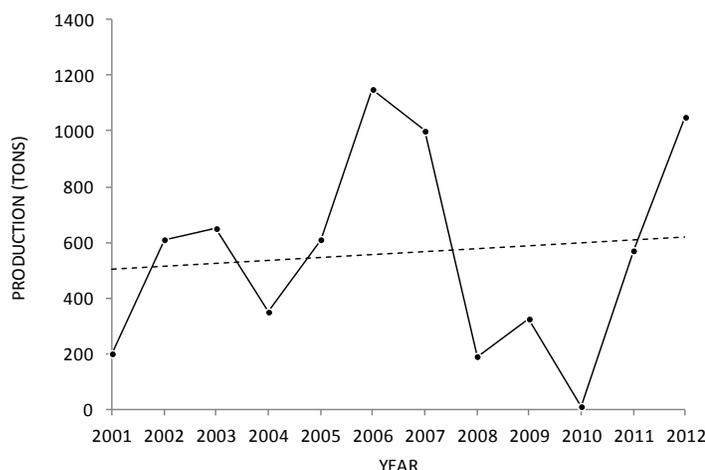


Figure 2. Annual catches and linear trend of three neritic tuna species landed at Palabuhanratu Fishing Port

*Source: Annual report on Statistics of Palabuhanratu Fishing Port 2001-2012*

### Seasonal variability of landing of neritics tuna

An increase in the catch of neritic tuna in 2006 and 2007, allegedly related to the increase in primary productivity waters, where in 2006 and 2007 occurred the phenomenon of dipole mode positive in the Indian Ocean for two years (consecutive events), increasing fertility waters and annual catch are very significant in the South Java (Amri, *et al.*, 2012).

The increasing catches in 2006 were related to the El Niño events with moderate intensity occurred in the Pacific Ocean that accompanies positive dipole mode in the Indian Ocean. The decline in catches drastically in 2010, allegedly related to the occurrence of a negative dipole

mode with La-Nina phenomena June index reached -0.7. This leads to high rainfall, which influence the decline in ocean primary productivity caused by the absence of upwelling waters along the southern Java, who are almost always appear in the normal phase (2012) and its intensity increased in the El-Nino phase and the positive dipole mode.

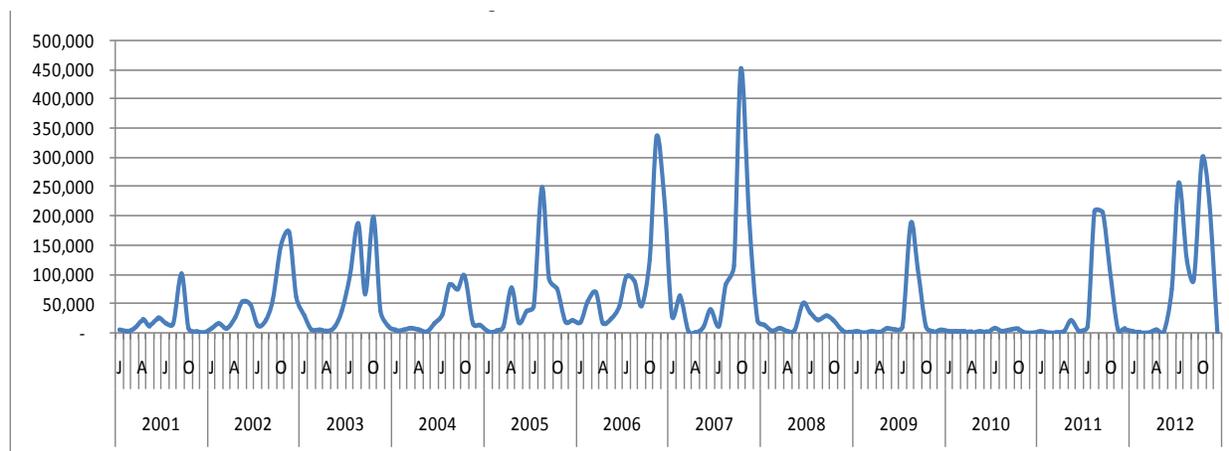


Figure 3. Monthly catch of neritic tuna in palabuhanratu fishing port.

From monthly catch trend (Figure 6), the increase of catch generally began from June. Highest peak are generally shifting from August-September-October-November. In 2001, the peak catches occurred in September; 2002 (October); 2003 (August and October); 2004 (August and October), in 2005 (August) in 2006 (November), in 2007 (October) ; year 2009 (August) in 2011 (August), and 2012 (July and October). As in 2008 and 2010, the catch is relatively the same (low) throughout the year.

### Catch by Fishing Gear

Preliminary analysis based on 5 years (2008-2012) nominal landing data of neritic tuna by fishing gears indicate that pelagic Danish seine significantly contribute to its landing. It shows that the catch is the highest among other gear. In 2011 the estimated catch was 568.8 tons, this proportionally to significantly increased on number of gear, although the catch decreased to 464 tons in 2012. Landing from Purse seiner also increased in 2011 and 2012, the catch shows a different compared to pelagic Danish seine because the number of purse seine only relatively small. The pelagic danish seine contribute about 77 % of neritic tuna landing in Palabuhanratu follow by purse seiner of 22% and the rest from gill net and troll line.

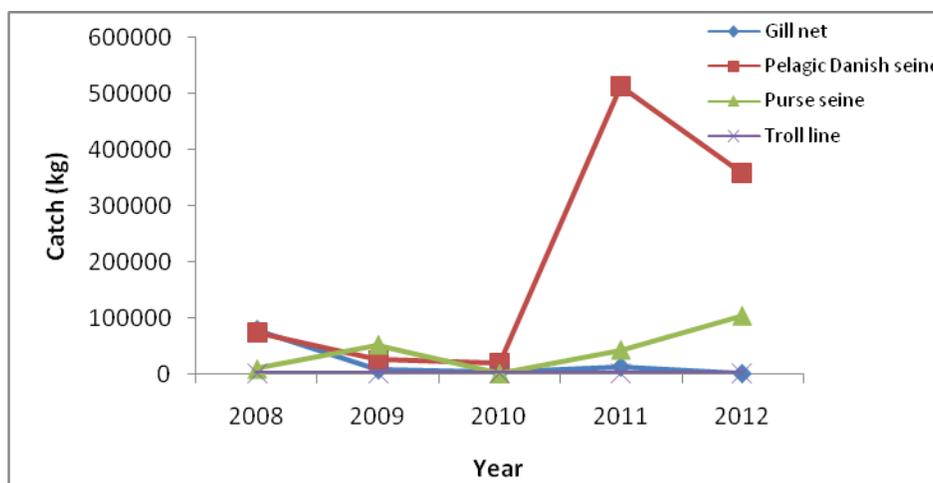


Figure 4. Annual catch by fishing gear in palabuhabratu fishing port

### Catch composition of Pelagic Danish Seine

There are three species of neritic tuna were landed i.e.: Kawakawa (*Euthynnus affinis*), longtail tuna (*Thunnus tonggol*), and bullet tuna (*Auxis rochei*). From landing data of 2008 to 2012 the highest landing of Kawakawa occurred in 2008 and the lowest lowest was in 2010, For the Longtail tuna in 2008 and the lowest in 2011, while the bullet tuna reach highest catch in 2011 and the decreasing in 2012. Bullet tuna increased drastically compare with kawakawa and longtail tuna in 2011 and lower in 2012 (right axis)

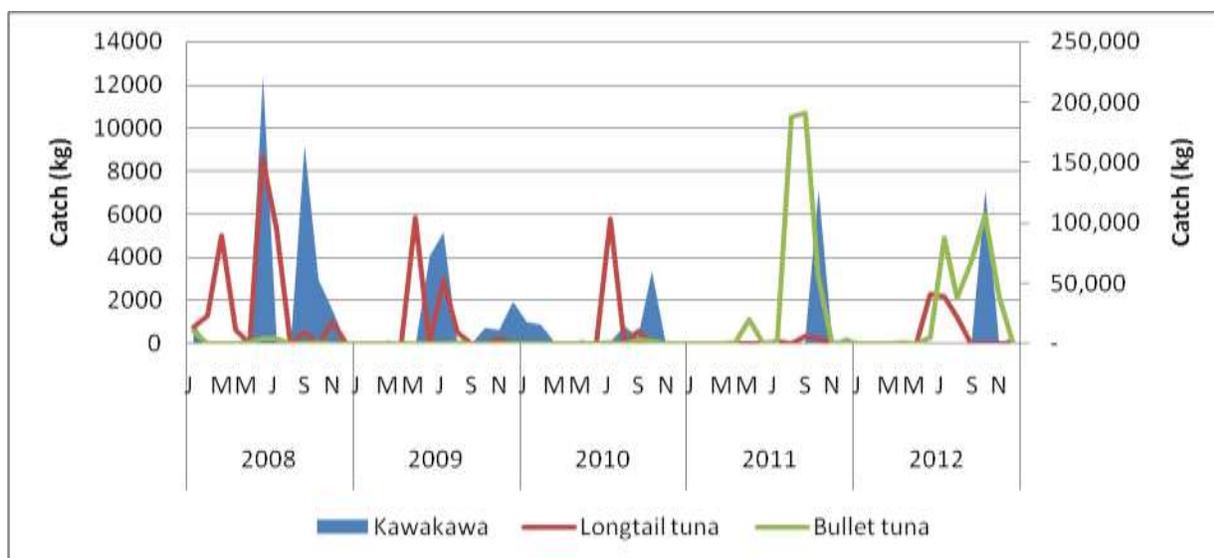


Figure 5. Montly catch of pelagic danish seine in palabuhabratu fishing port

## Fishing effort

Gill net, Pelagic danish seine and troll line are the main fishing gear in the area with boat size ranged from 5-10 GT, while purse seine vessel are bigger with size of 10-30 GT. Gill net and Pelagic danish seine usually fishing in the area of about 12 nm offshore, troll line and purse seine fishing area about 30 nm offshore.

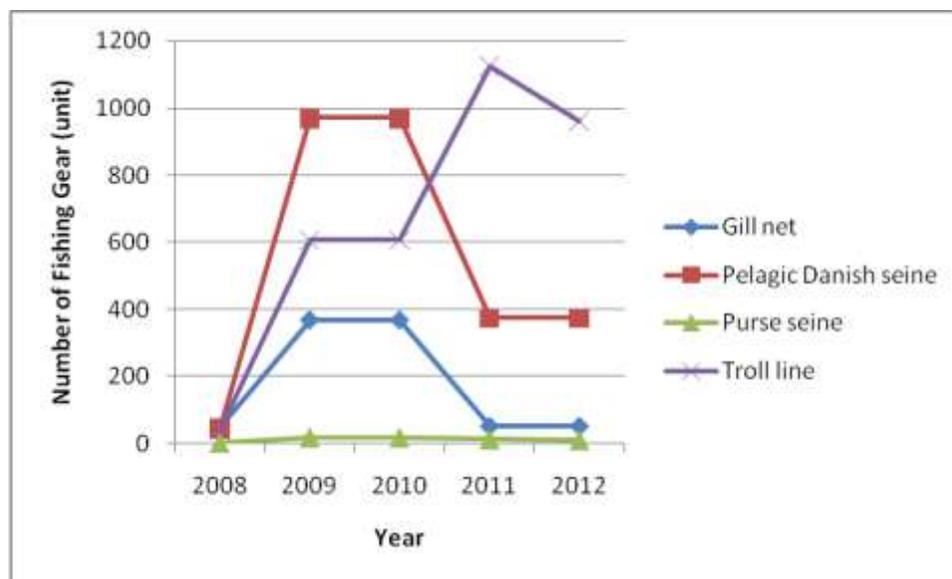


Figure 6. Number of fishing gear in Palabuhanratu fishing port

From the Figure 4, all number of fishing gear shows increasing trend in 2009, and 2010 the number is the same, the highest number increasing in 2009 is pelagic danish seine reach 971 unit, but fall down in 2011 until 375 in 2011 and still remain until 2012 from 2010 to 2011 fishing gear shows decreasing trend except troll line shows increasing significantly in 2011 (from 605 unit in 2010 to 1124 unit in 2011) and decreasing in 2012 to 961 unit. This is because a lot of vessel were converted their fishing gear into troll line especially gill net and pelagic danish seine.

## Catch Per Unit Effort (CPUE)

CPUE of neritic tuna from four fishing gear, pelagic danish seine, purse seine, gill net and troll line is seen that the highest CPUE of purse seine, then pelagic danish seine, gill net and troll line. CPUE of purse seine in 2011 reached 3281 kg/unit, and 10393 kg/unit in 2012. CPUE

of pelagic danish seine in 2011 reached 1365 kg unit, and 954 kg/unit in 2012. Gill net CPUE of 2011 was 241 kg /unit to 22 kg / unit in 2012. While the line troll CPUE in 2011 was 2.5 kg unit and 1.5 kg/unit in 2012, the low catch of neritic tuna from troll line because the main catches are yellowfin tuna and skipjack tuna while neritic tuna as by catch only. The decreasing of CPUE of pelagic danish seine is not shows the real abundance of neritic tuna in South Java water because CPUE of purse seine still continuou increasing it is possible there is local competition between purse seine and pelagic danish seine and reduce CPUE of pelagic danish seine.

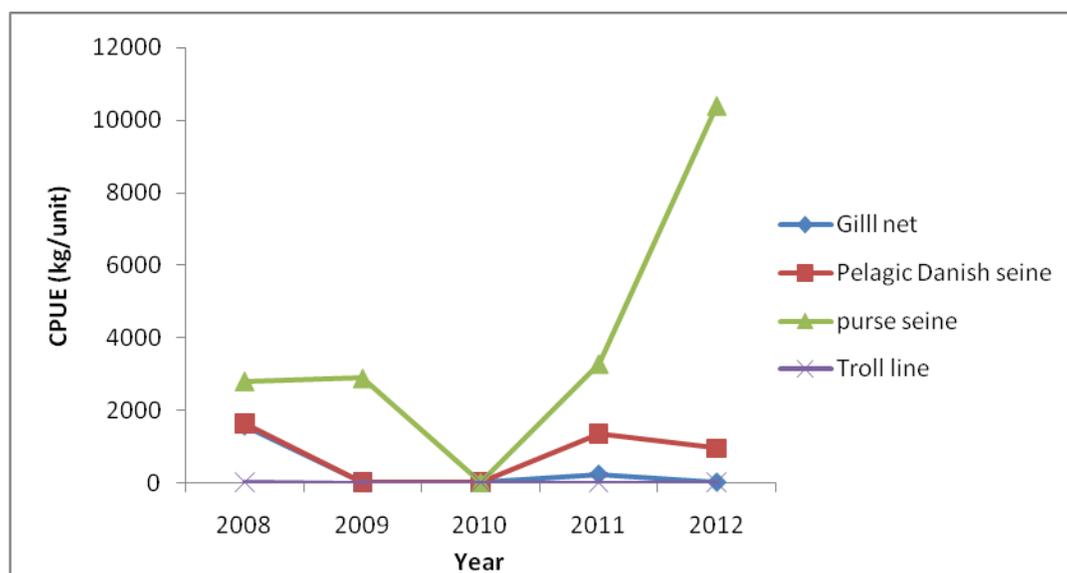


Figure 7. CPUE by fishing gear in Palabuhanratu fishing port.

The estimate CPUE of purse seine tend increasing significantly in last two years. Using this purse seine CPUE result, neritic tuna resources in South Java water still at the sustainable level.

## CONCLUSSION

The pelagic danish seine contribute about 77 % of neritic tuna catch in Palabuhanratu. Kawakawa, longtail tuna, and bullet tuna caught by pelagic danish seine from Indian ocean landed in Palabuhanratu fishing port, but most of the catch in last 2 years is bullet tuna and the peak season experienced from June to November. Annual catch of neritic tuna from national an Palabuhanratu statistic shows increasing trend. CPUE of purse seine tend increasing significantly

in last two years. Using CPUE result Neritic tuna resources in South Java water still at the sustainable level.

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