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**STINGRAYS FISHING SEASON INDEX BY CANTRANG (MINI TRAWL) EQUIPMENT LANDED AT
PPP MAYANGAN PROBOLINGGO EAST JAVA, INDONESIA**

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Abstract

Stingray (*Dasytidae*) is one of the catches of several fishing gears in Indonesia. Stingray and shark fish populations can be maintained if managed properly and efficiently. This study aims to provide information about some of these matters, especially for stingrays landed at Mayangan Port, Probolinggo City, East Java Province. This research was conducted from July to September 2019. The research method used was a survey method. The data used are data on the catch of cantrang fishing gear which was recorded when the ship was unloading at the Mayangan Probolinggo fish landing site for five years, namely 2014 - 2018. From the results of this study it can be concluded that: The decrease in the number of fishing gear has an effect of 81.52% on decrease in the number of stingrays caught, the highest percentage of stingrays caught in 2014, namely 76.97 tons, the highest Catch per Unit Effort was in 2014 at 447.52 kg / fishing gear, and the season for stingray fishing was January - June and August are the peak season, while July and September are the moderate seasons.

Introduction

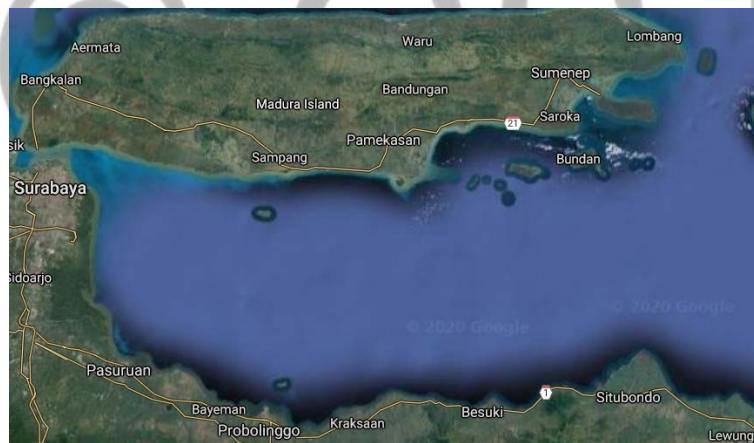
Stingrays (*Dasytidae*) are one of the catches of several fishing gears in Indonesia (Wijayanti et al., 2018). The 712 fisheries management area in the Java Sea is a major supplier of consumption fish, a provider of employment in the marine sector, as well as a fishery industry supporter, playing an important role in stingray fishing (Dharmadi & Kasim, 2010). In addition, the fishing area in the Java Sea is the most extensive in the western part (Hakim et al., 2017).

Stingray and shark populations can be maintained if managed properly and efficiently (Ekasari et al., 2018). Fishing activities have an impact in the form of scarcity on the Stingray population. This is related to the quite high increase in demand for both local, national and even international markets (Sarawati, 2016). FAO data for 2015 shows the types of shark and ray products in Indonesia were recorded at 103,245 tonnes (Fajar, 2018). If left unchecked, this could threaten population extinction, damage marine ecosystems and have an impact on Indonesia's food security. The urgency of protecting stingrays is a conservation effort. The

government has made efforts to issue regulations in the form of laws and regulations on the protection of sharks and rays in two events, namely repressive and preventive measures. Repressive efforts by imposing sanctions on players who catch stingrays while preventive efforts are to create conservation areas and through education and awareness for the community. One of these efforts needs to be supported by knowing the amount of stingray catch, catching season trends, and catching strength. This study aims to provide information about some of these matters, especially for stingrays landed at Mayangan Port, Probolinggo City, East Java Province. The fishing gear which is the source of information is Cantrang. This fishing gear is commonly called a mini-trawl. As it is known that this fishing gear has been banned in recent decades. However, the fishing gear is still operating and making arrests. Stingray fish is one type of fish that does not escape this fishing gear. So it is necessary to do a deeper study of how much this fishing gear takes stingrays in the waters.

Method

This research was conducted from July to September 2019, at the Mayangan Beach Probolinggo Fishery Port, East Java. The research method used was a survey method, directly observing the stingrays landed at the Mayangan Probolinggo fish landing site. The data used is data on the catch of cantrang fishing gear which was recorded when the ship was unloading at the Mayangan Probolinggo fish landing site for five years, namely 2014 - 2018. Figure 1. Map of



Research Locations

Catch data is then processed using simple excel calculations to obtain results concerning:

- Percentage of Effect of decrease in the number of fishing gear cantrang with fluctuations in the number of stingrays caught by cantrang fishing gear in 5 years (2014-2018)
- Fluctuation in the percentage of Stingray caught by cantrang fishing gear
- Catch per unit effort of the cantrang fishing gear in catching Pari fish. The calculation of catch per unit effort (CPUE) is calculated using the formula from the KKP (2003):

$$CPUE = \frac{\text{volume of catch (kg)}}{\text{Number of fishing trips}}$$

- and its relationship with the decrease in the number of fishing gear
- d. Stingray Fishing Season Index by cantrang fishing gear per year
- e. Pari fishing season index by cantrang fishing gear in general

The calculation of the fishing season uses a time series analysis (*moving average*) which refers to Dajan (1998) as follows:

- i. Arranging CPUE series
- ii. Arranging moving average CPUE for 1 year (12 months)
- iii. Constructing moving average CPUE centered (RG)
- iv. Arranging the average value in a matrix of ixj size (every month), followed by calculating the total average ratio each month, then calculating the total average ratio of the overall

Results And Discussion Catch Fluctuations By Cantrang

Stingrays caught by cantrang fishing gear and landed at the coastal fishing port (PPP) Mayangan Probolinggo decreased from 2014 to 2018. The highest decrease was in 2014-2015 which reached 32.93 tons, then the following year there was a consecutive decrease of 17.25 tons, 13.27 tons and 0.49 tons. The highest percentage of decline was in 2015-2016, namely 49.52%, and the lowest in 2017-2018 was 3.65% (Figure 2).

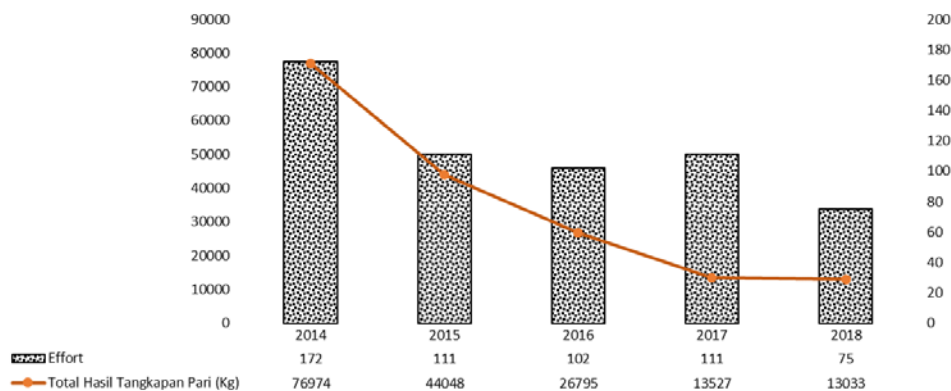


Figure 2 Fluctuation of Stingray caught by Cantrang for 5 years

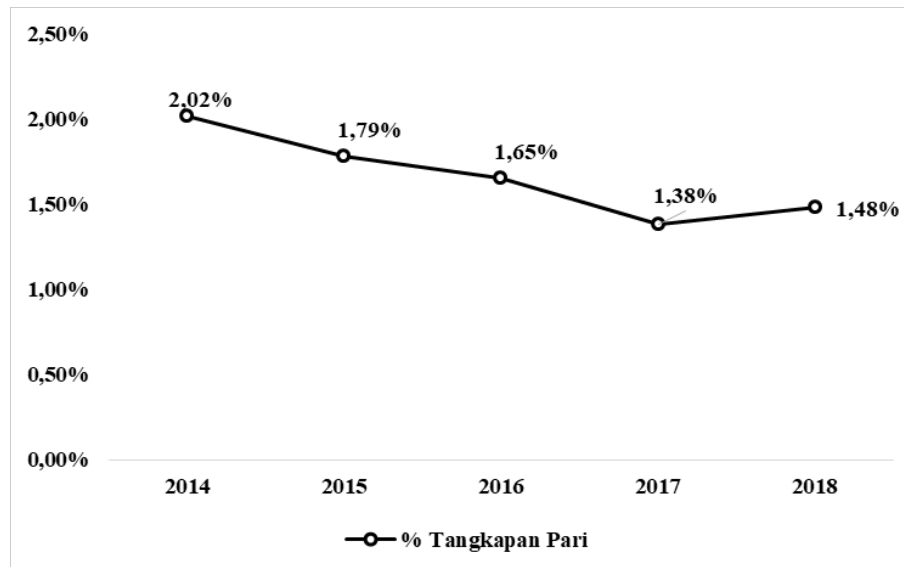


Figure 3 Fluctuation in Percentage of Stingray caught in Cantrang for 5 years The

analysis uses simple regression by comparing the amount of effort with the total catch of Stingray fish resulting in R^2 of 0.8152, so it can be concluded that the decrease in the number of fishing efforts being operated has an effect of 81.52% in reducing the number of stingrays caught by the fishing gear cantrang. This shows that the cantrang ban in 2015 could reduce the catch of stingrays.

The highest percentage of stingrays caught by cantrang was in 2014, namely 2.02% or 76.97 tonnes of the total catch (Figure 3). The average percentage of stingray catch per year is 1.67% of the total catch and is at 34.875 tonnes.

CPUE

Catch per unit effort decreased every year (Figure 4). The average annual decrease in CPUE was 33.78%. The highest CPUE in 2014 was 447.52 kg / fishing gear, the lowest CPUE in 2017 was 121.86 kg / fishing gear. A simple analysis using linear regression comparing CPUE trend with the number of fishing effort produces R^2 0.5095. The decrease in fishing effort affects the CPUE decrease by 50.95%.

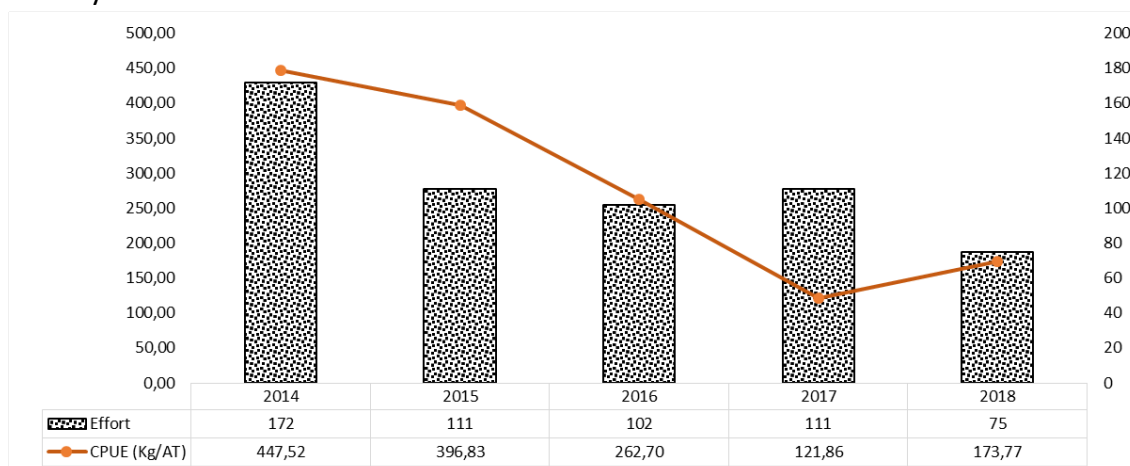


Figure 4 Catch Fluctuation per Unit Effort of Stingray caught in cantrang for 5 years

Fishing Season Index

fishing season occurs from January to June and in August, the season is in July and September to December (Figure 5). The highest peak of the fishing season is in February and the lowest is in September. As for one year, there is no visible dry season.

Stingray fishing season is found to be more stable in 2014 - 2015 (Figure 6). Meanwhile, in 2016 - 2018 the fluctuation in fishing season is more likely to have a big difference between the beginning of the year and the end of the year.

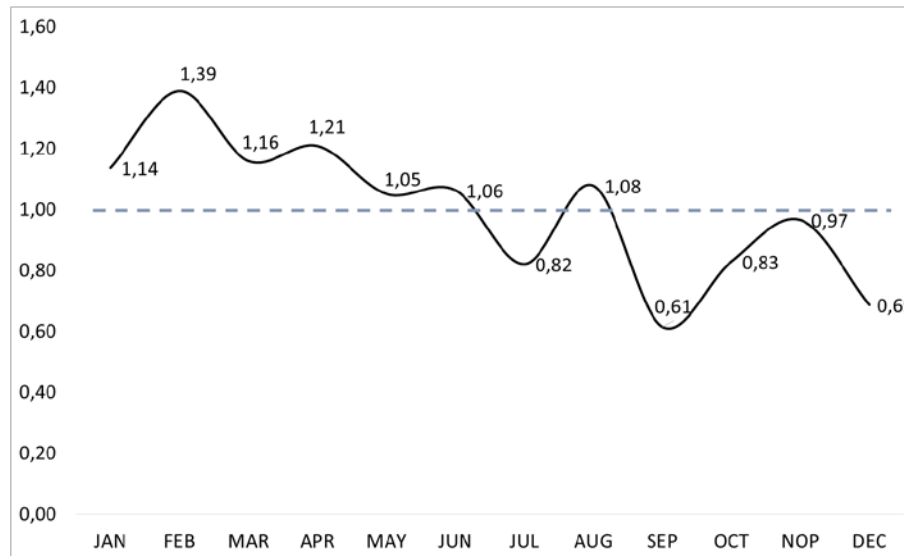


Figure 5 Fishing Season Index for Stingray caught by Cantrang in Mayangan, Probolinggo

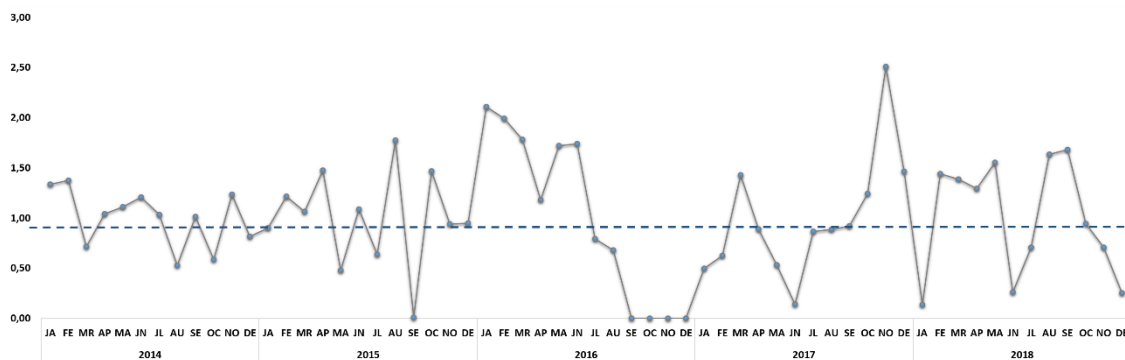


Figure 6 Fishing Season Index for Stingray caught by Cantrang for 5 years

Conclusion

From the results of this study it can be concluded that:

1. The decrease in the number of fishing gear has an effect of 81.52% on the reduction in the number of fish rays caught The highest
2. Percentage of stingrays caught in 2014 was 76.97 tons.
3. The highest catch per unit effort was in 2014 amounting to 447.52 kg / fishing gear
4. Stingray Fishing season, January - June and August, is the peak season, while July and September are the moderate season.

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