

Fluctuation of catch per unit effort and seasonal fishing index of grouper fish by cantrang fishing gear at PPP Mayangan, Probolinggo, Indonesia

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Abstract

Cantrang is a kind of trawl fishing gear that is operated by being pulled with a net mouth touching the bottom of the water. This fishing gear is usually used to catch shrimp and demersal fish. Aside from catching shrimp and demersal fish, in cantrang catches there are also groupers. Grouper fish is one type of fish that is included in the superior commodity and has a high economic value, so its existence must be maintained and protected. This study aims to look at the trend of grouper caught by cantrang fishing gear landed at PPP Mayangan Probolinggo during 2014-2018. Groupers are caught throughout the year by cantrang fishing gear, with a peak in April-June for 5 years (2014-2018). Catch per unit effort of grouper fish with cantrang fishing gear has decreased from 2014 to 2017 by an average of 16% then increased by 92% in 2018. Furthermore, it might be possible to study other fishing gear that catch groupers, so that the discussion becomes more comprehensive.

Keywords: Cantrang, CPUE, Fishing Season, Kerapu, Probolinggo

Introduction

Cantrang is a trawler-type fishing gear that is operated by being pulled with the mouth of the net touching the bottom of the water. This fishing gear is usually used to catch shrimp and demersal fish. Apart from Law NO 2 / PERMEN-KP / 2015 concerning the prohibition of operation of cantrang fishing gear, catch fish production every day have a large contribution to the economic turnover of fishermen and residents around the port. Probolinggo Regency is one of many districts in East Java that has a coastal area with catch production reaching hundreds of millions of rupiah per year (Rohman, 2019) [4]. The majority of fishing gear units found in the Mayangan Port are cantrang fishing gear, totaling 117 units out of a total of 189 units.

Aside from catching shrimp and demersal fish, there are also groupers if we use cantrang to catch the fish. Grouper fish is one type of fish that is included in the superior commodity and has a high economic value, so its existence must be maintained and protected (Irnowati *et al.*, 2011) [3]. Grouper fishing activities around Probolinggo waters led to a competitive utilization pattern among cantrang fishermen, so it was feared that the condition of grouper fisheries in these waters had experienced over exploitation (Akbarsyah *et al.*, 2020) [1]. The assessment of catch volume will support better management of grouper fisheries. So as to reduce the ecological impact on the waters, this study aims to look at the trend of grouper caught by cantrang fishing gear landed at PPP Mayangan Probolinggo during 2014-2018.

Method

The research activities were carried out in July-August 2019 at PPP Mayangan Probolinggo City, East Java Province. The City of Probolinggo was chosen, because it is one of the areas where most of the fishermen were affected by the enactment of Ministerial Regulation No. KP. 2/2015.



Sumber: Google Earth

Fig 1: Map of Research Location

The material needed in this study is secondary data in the form of:

1. Data on the number of cantrang fishing gear starting in 2014-2018
2. Data on catches of cantrang vessels starting in 2014-2018
3. This data was obtained from statistical records of the PPP Mayangan Probolinggo landing site starting in 2014-2018. The method used in this research is descriptive method. Data collection is assisted by direct observation in the field to see and document the types of fish caught, and conduct literature studies to look for catch data. The sample chosen was all cantrang ship data, both regarding the number of vessels, the number and types of catches, fluctuations in the price of fish species during 2014-2018.

The data that has been obtained from the fish auction place is processed according to the following analysis needs:

- a. Catch per Effort Unit for 5 years (2014-2018)
- b. The CPUE value is calculated by dividing the total number of catches with the number of catches per year.
- c. Determine the catch season index with stages:

1. calculate the monthly CPUE ratio with the monthly average CPUE in a year
2. calculate the catch season index (IMP) of fish resources, which refers to Zulkarnaen *et al.*, (2012) with the following groupings: 1) Famine season if $IMP < 50\%$; 2) Medium Season if $50\% \leq IMP < 100\%$; and 3) Peak Season if $IMP > 100\%$.

Result and Discussion

Grouper caught by cantrang fishing gear fluctuate from year to year. Most catches in each year are located in the middle of the year in the early month, namely between April to June (Figure 2). This is consistent with researchers from (Yulianto *et al.*, 2016) [5] who found that the ten-month grouper fishing season starts from march to may, with the peak of arrest in March. March becomes the peak of grouper catching possibly due to low rainfall, this increases the chances of fishermen leaving to carry out fishing operations. The high level of chlorophyll-a as a result of the upwelling process is also a factor supporting the peak of the fishing season in March.

So that in 2018, the catch will increase very sharply even though the number of fishing fleets decreases. The possibility that can occur is that the cantrang fishing gear is full of other types of demersal fish, so the grouper that is caught can become decreased in 2015-2017. However, when viewed from the monthly trend (figure 2), groupers are still caught a lot in the early months of the year, so the decline in the number of fishing fleets operating is the strongest cause of decline in grouper catches.

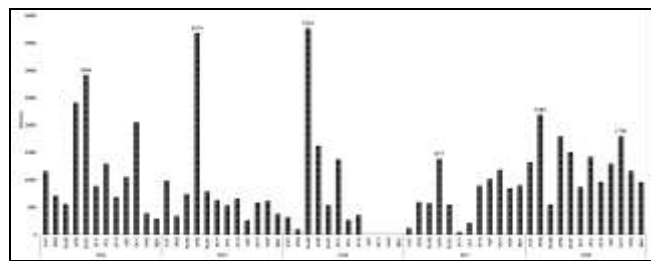


Fig 2: Fluctuation of Grouper Catches per Month in 2014-2018

The most grouper catches from 2014 to 2018 at most were in 2018 totaling 15,728 kilograms. This figure is not much different from 2014 which was 14,239 kilograms. The amount of grouper fish catch in 2015-2017 continues to decrease up to 4 tons (2014-2015) or by 29%, and by 2 tons (2016-2017) or by 18%. Whereas in 2018 grouper catches by cantrang increased by 92% (Figure 3).

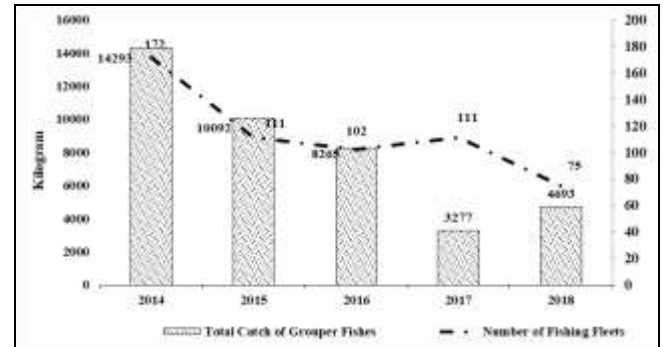


Fig 3: Fluctuation of Grouper Catches and Number of Cantrang fishing gear in 2014-2018

In research produced by Permana (2017) [7] the level of utilization of grouper fish in Probolinggo waters has reached 185.57%. According to the FAO, these conditions are included in the depleted category, whereas according to ministerial regulations, such conditions include those in the over-exploited category. JTB grouper fish caught by all fishing gear landed at PPP Mayangan is the smallest of most other demersal fish, which is 438.13 tons / year. Cantrang fishing gear contributes 0.03% of the total grouper catch in the Mayangan Probolinggo PPP. This amount is not so large when compared to the number of groupers caught by other fishing gear. However, if you look at the utilization rate figures that have reached the over exploited category, caution is needed when carrying out cantrang operations so as to reduce the number of grouper fish caught. Panggabean (2012) [6] argues that the abundance of reef fish included in the grouper is influenced by several things one of which is damage to the reef as a fish habitat. The number of coral inhabitants will decrease if the habitat is not sufficient for food supply and not good enough for spawning.

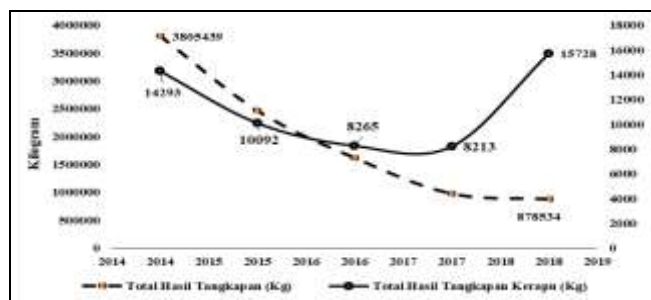


Fig 3: Figure 2. Fluctuation of Grouper Catches in 2014-2018

The trend in the number of fishing gear per year shows a decrease (Figure 4), so this indicates that the decline in grouper catches in Probolinggo is due to the decline in fishing gear. The grouper catch in 2018 increased by 92% but the number of fishing gears remained decreased to 75 only. This could have happened because between 2015 and 2017 there was a decrease in fishing intensity so that the grouper resources had time to develop properly (Damayanti *et al.*, 2016) [2].

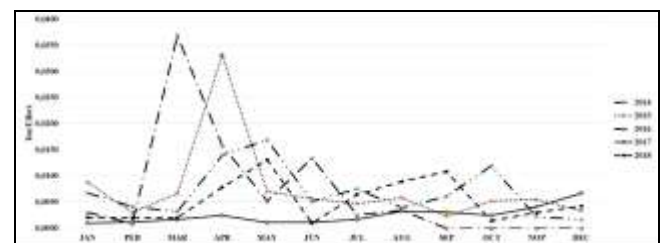


Fig 4: Catch Fluctuation Per Unit Effort Cantrang fishing gear for groupers 2014-2018

The highest CPUE is around March 2016 and April 2015. In March to June the CPUE value is calculated to be higher than other months of the year (Figure 4). But CPUE values fluctuate throughout the year in other months.

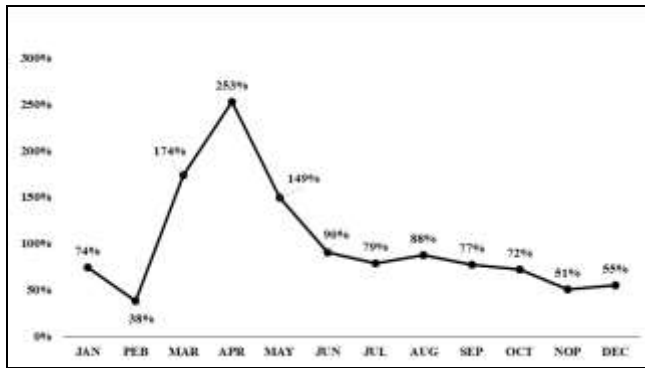


Fig 5: Index of Grouper Catching Season with cantrang fishing gear in Probolinggo

The peak season for grouper catching in Probolinggo with cantrang fishing gear is in March - May. The season is happening most of the year, starting in June and ending in January. While the famine season occurs in February alone. The highest figure was in March 174%, April 253%, and in May 149%. While from June to January, it ranges from 50-90%. The lowest figure is 38% in February.

Conclusions

Based on this research, we can conclude

1. Catch per unit effort of grouper fish with cantrang fishing gear has decreased from 2014 to 2017 by an average of 16% then increased by 92% in 2018.
2. The peak season for grouper fishing with cantrang fishing gear occurs in March - May, while the famine season in February, in the month other than that, the medium season occurs.

Suggestions

1. The assessment of grouper catches with cantrang fishing gear at PPP Mayangan Probolinggo will be more complete if data are available on catches with other fishing gear that also land the catches at PPP Mayangan.
2. The assessment will be even more comprehensive if available data on fish prices in the Probolinggo market during the 2014-2018 period.

References

1. Akbarsyah Nora, Putra PK, Andhikawati A, Permana R. ANGKA TANGKAPAN KERAPU (*Ephinephelus* sp) OLEH ALAT TANGKAP CANTRANG YANG DIDARATKAN DI PPP MAYANGAN PROBOLINGGO. 2020; 1(1):12-17.
2. Damayanti H, Brown A, Sari TEY. Fluktuasi Hasil Tangkapan Ikan Pelagis Dengan Alat Tangkap Jaring Insang Hanyut (Drift Gillnet) di Perairan Dumai, Provinsi Riau, 2016.
3. Irnawati Ririn, Simbolon D, Wiryawan B, Murdiyanto B, Nurani T. Analisis Komoditas Unggulan Perikanan Tangkap di Taman Nasional Karimunjawa. Jurnal Saintek Perikanan. 2011; 7(1):1-9.
4. Rohman Taufiq. 濟無No Title No Title. Psikologi Perkembangan, 1(October 2013), 2019, 1-224. <https://doi.org/10.1017/CBO9781107415324.004>
5. Yulianto I, Wiryawan B, Taurusman AA, Wahyuningrum PI, Kurniawati VR. DINAMIKA PERIKANAN KERAPU DI TAMAN NASIONAL KARIMUNJAWA (Grouper Fishery Dynamics in

Karimunjawa National Park). *Marine Fisheries: Journal of Marine Fisheries Technology and Management*. 2016; 4(2):175. <https://doi.org/10.29244/jmf.4.2.175-181>

6. Panggabean. Diversity of reef fish species and coral health conditions on GOF Minor and YEP islands of the Prophet Raja Raja Ampat. *Indonesian Fisheries Research Journal*. 2012; 8(2):109-115.
7. Permana RBA. Analysis of Sustainability of Demersal Fish Resource Management in the North Coast Waters of the Mayangan Fisheries, Probolinggo City, East Java. Bachelor thesis, Universitas Brawijaya. Malang [ID]. Not published, 2017.