Capture Process of White Pomfret (*Pampus argenteus*) on Gillnet: A Case Study of Pangandaran Regency, Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. Author DFLS designed the study, performed the analysis, wrote the protocol and wrote the first draft of the manuscript. Authors IMA, HH and YM managed the analyses of the study. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Gillnet is a wall of netting that hangs in the water column, typically made of monofilament or multifilament nylon, had the same size and usually used by fisherman in Pangandaran. This research aims to see the capture process of white pomfret (*Pampus argenteus*) on gillnet in Pangandaran Regency. This research was conducted in August 2018 and January 2019 in Pangandaran. The data used in this research are primary data consisting of the proportion of catches and capture process, whereas secondary data obtained from Dinas Perikanan Pangandaran. The results of this research show that the quantity and weight proportion of main catch > bycatch and captured process of white pomfret dominated by wedged by 94% and the lowest is gilled by 6%.

Keywords: Capture process; gillnet; white pomfret; proportion.

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1. INTRODUCTION

Capture fisheries production, which reaches 5.8 million tons and continues to increase makes the fisheries sector has a great potential to contribute to the development of the Indonesian economy [1]. Pangandaran Regency has extensive marine resources waters. This condition makes the fish resources in Pangandaran waters must be utilized optimally. Supporting fishing activities can help optimize fisheries resources [2].

The fishing gear used by Pangandaran fishermen has various types [3]. Gillnet is one of the fishing gear that is widely used by fishermen in Pangandaran Regency. Small-scale fisheries are the most common fisheries type in Pangandaran Regency and most of them using gillnet as their fishing gear due to their simple, economic and easy to use. Gillnet selectivity can be adjusted according to the needs of the main catch fish [4]. Gillnet is a selective fishing gear due to it depends on the process of catching fish, gillnet construction used and the type of fish caught [5].

White pomfret (*Pampus argenteus*) is one of the five potential fish in Pangandaran [6]. According to [7], one of the catches of fish that have high economic value is white pomfret.

The success of fishing activity determined by several factors such as skills, technology, fishing methods, fish behaviour and determination of fishing areas according to [2]. Catching fish by using gillnet fishing gear depends on the mesh size that used, and also the size of the targeted white pomfret fish [8].

How to catch fish by gillnet is divided into four ways, namely snagged, gilled, wedged and tangled [9]. Most of the fish caught will suffer bodily injuries such as the mark on the body of the fish caught in the net. Some fish lose their upper body and were injured, due to the fish movements when ensnared [10]. The purpose of this research is to determine how to catch white pomfret using gillnet fishing gear.

2. MATERIALS AND METHODS

This research was conducted using a survey method. The data needed in this research are primary and secondary data. Primary data were obtained by the method of experimental fishing, interviews and documentation, while secondary data are supporting data from the Pangandaran Fisheries Service. The net used is 4 inches made from millennium with the main catch of White Pomfret (*P. argenteus*). The gill net used has 712 meters long and 8 meters wide. A gillnet is operated for six trips using 2 GT vessels. One trip is one day (one-day fishing) with a repetition of 2 to 3 times.

Gillnet is a simple fishing gear according to its design, construction, method of operation and also economical to reach by fishers [11]. Gillnet fishing gear made of mono / multi-filament nets which are a rectangular shape with buoys and weights to block the rate of fish (Fig.1). The size of the net mesh used by gillnet varies depending on the main catch. Kazi, et al. [12] stated that the gillnet operation was carried out by looking at the location of the main fish target.

Description:

a. Float Sign   d. Ballast
b. Float   e. Top Rope
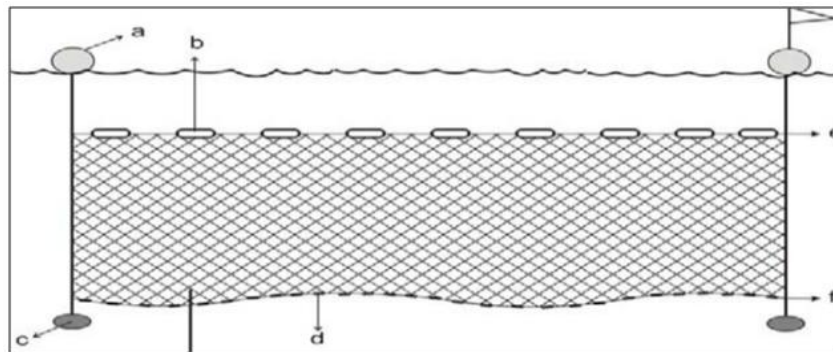c. Ballast stone   f. Bottom Rope

Fig. 1. Gillnet construction
Source: Kazi (2010)

Gillnet used in this research is Millenium Millnet with 4.5-inch mesh size in dark colour (dark blue). Gillnet construction consists of:

1) A float mark as a marker of the net end made of cork and tied to bamboo with a flag and a string to pull the net.
2) The buoy made of elliptical plastic material
3) Ballast made of casted cement in cylindrical shape
4) Ballast made of casted cement in round shape with a diameter of 8 cm and 2 cm thick
5) Top rope over the attachment of buoys
6) Bottom rope for ballast
7) Dark colored rope (dark blue) made of polyester function to pull the net with a length of 50 meters.

The tools used in this research are hanging scales to measure fish weights, buoys for safety when taking trips, cameras for documenting research activities, questionnaires for interviews with fishers, survey sheets to collect all research data. The parameters measured in this research are the way to catch white pomfret (snagged, gilled, wedged and entangled), the proportion of the amount and weight of the catch.

The proportion of the main catch and by-catch catches weight are calculated using the formula as follows:

a. The proportion of main catches of gill nets ($P_{MainCatch}$)

$$P_{HTU} = \frac{a_n}{a_n + b_n} \times 100\%$$

b. The proportion of bycatch of gill nets ($P_{Bycatch}$)

$$P_{Byctach} = 100\% - P_{MainCatch}$$

Information:

a_n = Weight of the main catch
b_n = Weight of the by catch

3. RESULTS AND DISCUSSION

Fishing activities in Pangandaran Regency are dominated by small-scale fishing, even that Pangandaran District has the potential for capture fisheries with a sea area of 67,340 Ha. This potential must be supported by facilities and infrastructure such as the Fish Auction Place.

One of the very active Fish Auction out of 9 Fish Auction in Pangandaran District is Cikidang Fish Auction. Gillnet fishing gear has the most amount used in Pangandaran Regency compared to other fishing gear, based on 2016 Department of Fisheries, Marine and Food Security Pangandaran Regency (Table 1).

Table 1. Operated fishing gear in pangandaran regency

No	Type of fishing gear	Ammount (Unit)
1	*Gillnet*	1914
2	Trammel Net	305
3	Mini Purse Seine	10
4	Liong Bun	30
5	Long Line	50

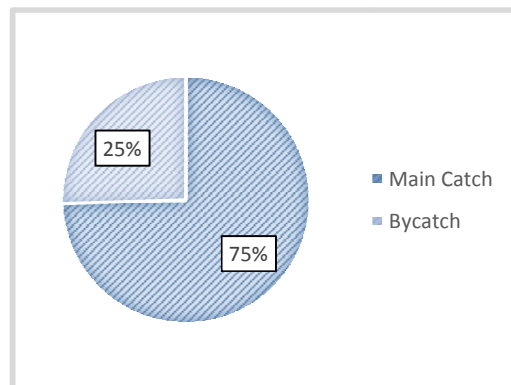*Source: Department of Fisheries, Marine and Food Security Pangandaran Regency 2016*

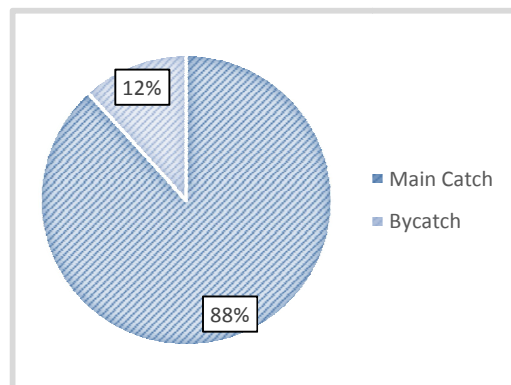**Fig. 2. Percentage of the main catch and bycatch of gillnet fishing gear**

Fig. 3. Gillnet weight proportion percentage of main catch and bycatch

Gillnet can catch various species of fish depending on the size of the mesh used. One

of the main catch commodities is white pomfret. According to the statement of Ghosh, et al. [13] that white pomfret has a significant proportion of catches by using gillnet fishing gear.

3.1 Proportion of Amount and Weight

The total main catches of white pomfret for 6 trips are 126, and the total bycatch is 43, consisting of 2 species. The proportion of the amount of catch shows that the target fish has a higher percentage of 75% compared to bycatch, this means that main catch > bycatch. This condition indicates that gillnet can effectively catch white pomfret.

Fishing gear must be able to catches a fish with a sufficient proportion of weight in order to maintain its sustainability. The total weight of the main catch for 6 trips are 28.5 kg, and bycatch is 3.8 kg. The proportion of the main catch weight is 88% greater than bycatch. This condition indicates that main catch > bycatch. A higher proportion of the number and main catches can be interpreted that gillnet fishing gear is effective and efficient fishing gear. Supported by the statement of Gladston, et al. [14] that gillnet is an efficient and selective fishing gear that is used actively or passively to catch fish.

3.2 Capture Process

White pomfret caught using a gillnet with a 4.5-inch mesh size resulting in the fish caught in two ways (Fig. 4). According to Schlechte [15], the way fish were caught can be classified into four ways, namely snagged, gilled, wedged and entangled.

a   b

Fig. 4. Capture process white pomfret (a) *Gilled*, (b) *Wedged*
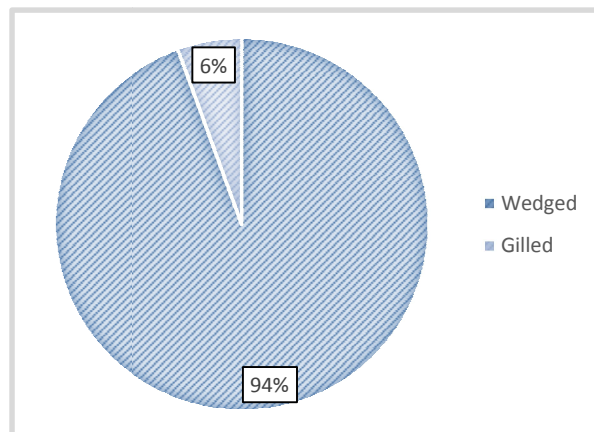

Fig. 5. Percentage capture process of white pomfret on g*illnet*

The percentage of fish caught through wedged is 94% by 119 fishes, while the percentage of fish caught by gilled by 6% is seven fishes. The size of girth of white pomfret larger than the net makes the percentage of fish caught by wedged higher than gilled. This causes the fish to be stuck/stuck to the body of the fish.

4. CONCLUSION

Based on the research, it can be concluded that the 4.5 inch mesh sized gillnet with white pomfret catches in Pangandaran Regency was caught in two ways, namely gilled and wedged. Most of the catch was caught by wedged ways, while the least is gilled ways. All fish captured are in good condition, there are only traces of net mesh on the body but do not damage or injured the fish.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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