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SHORT COMMUNICATION

Capture process of mackerel (*Scomberomorus commerson*) on gillnet in Pangandaran water

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ABSTRACT

Gillnets are simple fishing gear that commonly used by fisherman in Pangandaran. This research aims to see the capture process of mackerel (*Scomberomorus commerson*) on gillnet in Pangandaran waters. This research was conducted in August 2018 and January 2019 in Pangandaran, West Java. This research using survey method. 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 shows that the quantity and weight proportion of Bycatch > Maincatch and capture process of mackerel dominated by *wedged* by 79% and the lowest is *snagged* by 7%.

***Keywords*:** capture process, gillnet, mackerel, proportion, *Scomberomorus commerson*

1. INTRODUCTION

Indonesia's marine fisheries potential reaches 10.5 million tons/year. The marine and capture fisheries sector is a mainstay area. One of the contributors in capture fisheries in

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Indonesia is the Fish Landing Base (PPI) (Maulana 2019). Coastal waters are the outer boundary ecosystem that is influenced by dynamic natural processes and has a variety of wealth (Suprapto et al 2014, Walim et al, 2019).

Pangandaran waters have vast potential of marine resource. Therefore, fish resources in Pangandaran waters must be optimally utilized. Optimal fisheries resources must be supported by fishing activities so that they will continue to be sustainable and increase Pangandaran's fisheries production (Apriliani 2018).

Pangandaran fishermen use various types of fishing gear to catch fish (Apriliani 2019). One of the most used fishing gear by fishermen in Pangandaran is gillnet. Gillnet is widely used in small-scale fisheries because it is a simple and has a cheap labor and equipment fishing gear, also it is effective in capturing widely spread fish populations (Reis & Pawson 1992). Compared to other fishing gear, gillnet is more selective (Hickford et al 1997). Gillnet is a selective fishing gear for both species and the size of fish caught, the gillnet catches very variative depending on the schooling movement and fish habitat that caught by the net (Jones and Hadfield 1985).

Mackerel (*S. commerson*) is one of the catches gillnet. McPherson (1992) in Kaymaram et al. (2010) stated that mackerel is a pelagic fish that is spread throughout the tropical waters of Indonesia Pacific. This fish is considered as an important pelagic species (AL-Hosni and Siddeek 1999).

The factors that determine the success of fishing operations is: skills, technology, fishing methods, fish behavior and determination of fishing areas (Apriliani 2018). Determination of fishing area will affect the composition of species and the quantity of catches. According to Wardle et al (1991) the success of catching is also influenced by the color of the net or transparency such as nets made from fine threads that are not visible by fish. If the color of the net matches the color of the waters of the fishing area, the net will not be visible and it possibly of fish to be captured. There are four ways capture prosess is snagged, gilled, wedged and entangled (Rakhmadeultt et al. 2008). Capture prosess will affect the condition fish and determine the effectiveness and the ability of the net to trap the target fish. Rakhmadeultt et al (2008) stated that most of the fish caught had bodily injuries such as marks on fish bodies due to entangled nets. Some fish lose their upper body, and injured to rebellion carried out by fish when entangled. The purpose of this research is to find capture prosess mackerel and the condition of a good fish when caught using a gillnet fishing gear.

2. MATERIALS AND METHODS

This research was conducted in August 2018 and January 2019 in Pangandaran, West Java, at PPI Cikidang. The gillnets have a mesh size of 3, 5 and 4 inch with the main catch of mackerel (*S. commerson*). The gillnet'size are 650 and 750 meters long with 12 meters wide.

This research uses a survey method. The data in this research was taken in several ways, first is primary data with experimental fishing method, documentation, interviews and second is secondary data as supporting data from the Pangandaran Fisheries Agency. Interviews were conducted with fishermen gillnet to explore and collect information using purposive sampling method. Gillnet is operated for 8 trips using 2 GT boat. One trip is one day fishing with repetitions of 2 to 3 times.

The tools used in this research are scales to measure fish weight, life jacket for safety when sailing, cameras for documentation of activities during research, questionnaires for

interviews, survey forms to collect research data to be processed. The parameters measured in this research is capture prosess (snagged, gilled, wedged and entangled, proportion of the quantity and weight of the catches.

The proportion of weights and the quantity of main catch and bycatch is calculated using the formula:

a. Proportion of weight of main catches gillnet (P_{HTU})

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

b. Proportion of weight of bycatcth gillnets (P_{HTS})

$$P_{HTS} = 100\% - P_{HTU}$$

Information:

a_n : Weight/quantity of main catch
b_n : Weight/quantity of bycatch

3. RESULT

Pangandaran Regency is a potential area of capture fisheries. This potential certainly must be supported by the provision of supporting facilities and infrastructures such as Fish Auction Place. TPI Cikidang is one of 9 TPI in Pangandaran Regency where the research was conducted. *Gillnet* is a fishing gear that has the most used compared to other fishing gear. This was seen based on the Pangandaran Regency 2016 DPKP Marine Data (Table 1).

Table 1. Types of Fishing Gear Operating in Pangandaran Regency

No	Type of Gear	Quantity (Unit)
1	*Gillnet*	1914
2	Trammel Net	305
3	Circular Net	10
4	Liong Bun	30
5	Rawe Fishing	50

Source: DPKP Kab. Pangandaran 2016

3. 1. Construction *Gillnet*

Gillnet is a simple fishing gear that is easy to operate and economical so it is affordable for fishermen. Gillnet is a unit of fishing gear that is rectangular with a certain mesh size and is

the same size in all nets with a smaller number of mesh sizes for depth compared to the mesh size to the side and consists of buoys and ballast (Figure 1). Satyanarayana and Sadanandan (1962) state that gillnet when stretched will be rectangular and consists of a net with a upper rope section, there are buoys and lower ballast straps along the horizontal line.

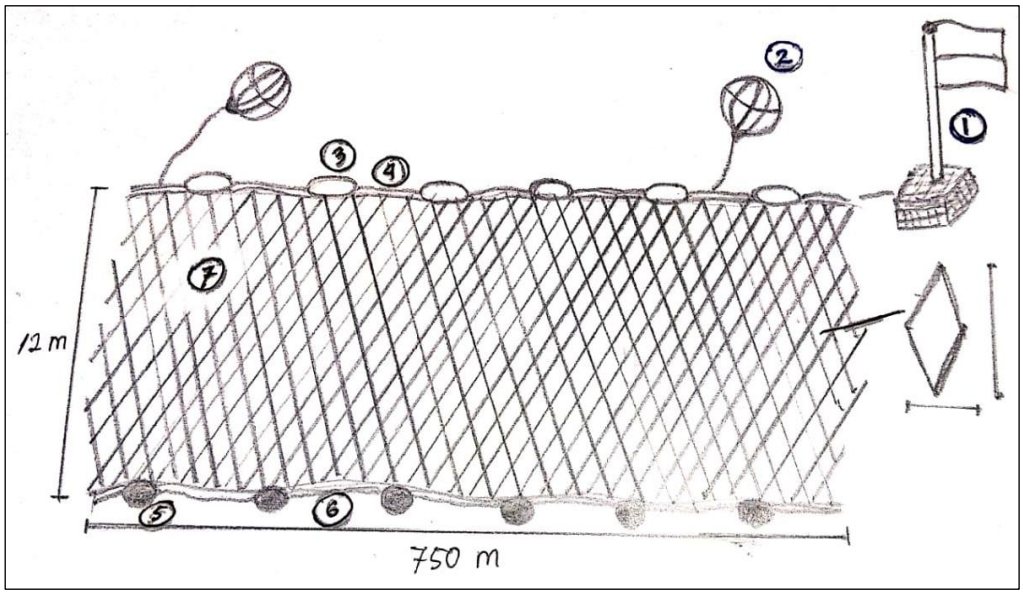


Figure 1. Construction Gillnet

Information:

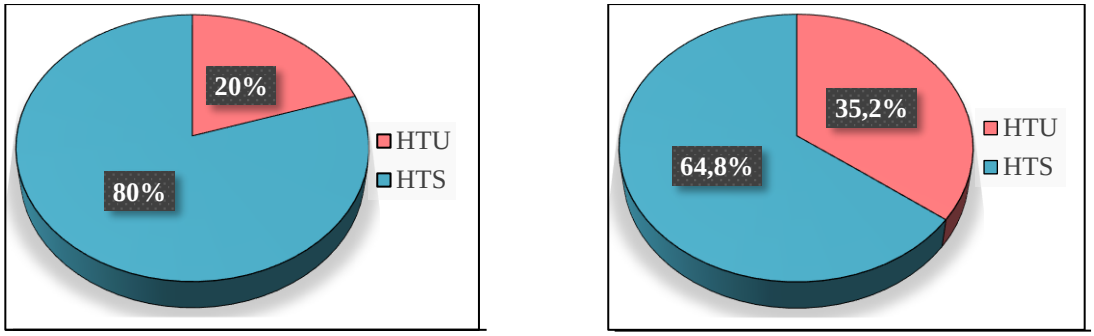
1. Sign buoy, 2. Pennant bouy, 3. Buoy, 4. Top rope, 5. Vallast, 6. Bottom rope, 7. Net body

Gillnet used in this research is an ordinary gillnet with mesh size 3.5 inch and millennium gillnet with 4 inch mesh size. Gillnet construction consists of:

1) Sign buoy as markers of both ends of the net made of cork tied to bamboo and given a flag also a piece of rope to pull the net.
2) Pennant buoys, which are an additional buoys at the top which are tied to the upper rope.
3) Buoy made of elliptic plastic
4) Top rope over the attachment of buoys.
5) Ballast made of cement casted in a round shape with a diameter of 10 cm and 2 cm in thick.
6) Bottom rope for ballast
7) A net with all mesh size sizes is equal to the mesh side size more than the bottom mesh size.
8) A piece of dark green string and made of polyester serves to pull a net 50 meters long.

Gillnet captures various species depending on the mesh size. One of the commodity whose main catch is mackerel fish. This statement correspondense to Ehrhardt and Die (1988) in Hutubessy and Syahailatua (2010) that gillnet selectivity has been studied and applied to various species of fish such as mackerel.

3. 2. Quantity and Weight Proportion



a b

Figure 2. Quantity proportion percentage of Maincatch anf Bycatch using Gillnet (a) 3.5 Inch Mesh Size, (b) 4 Inch Mesh Size

The proportion of the main catch of mackerel with 3.5 inch mesh size is 92 fish and bycatch is 369 fish, while for 4 inch mesh size is 96 fish and the total bycatch of 177 fish consisting of 7 species. The proportion of catch results shows that the target fish has a smaller percentage than bycatch (HTS> HTU). The diversity of catches species is due to the similarity of habitat between target fish and non-target fish.

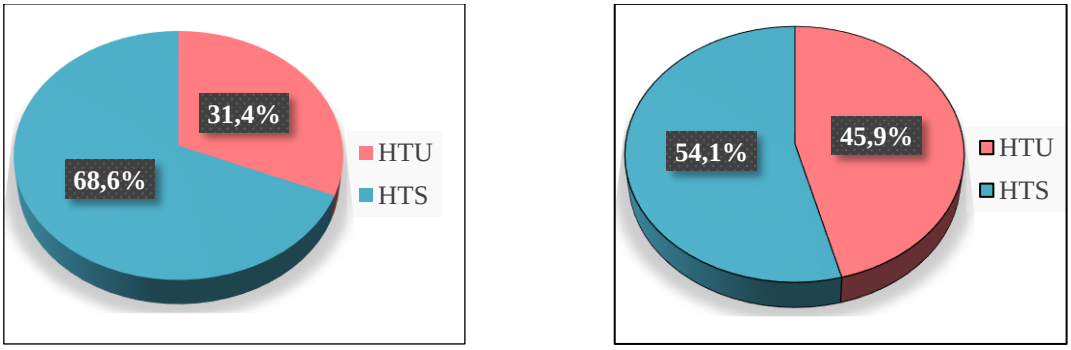


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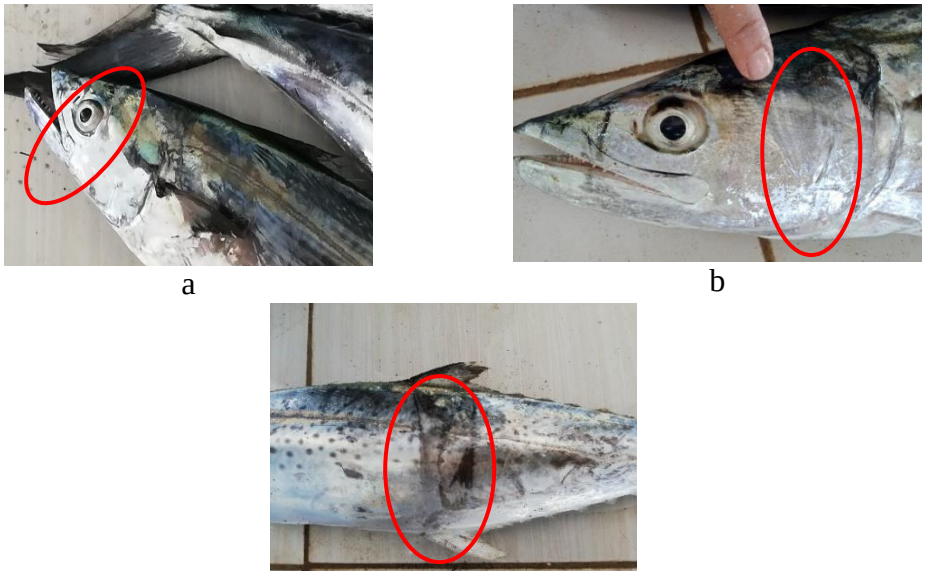
Figure 3. Percentage of Proportion of the Weight of HTU and HTS using Gillnet (a) Mesh Size 3.5 Inch, (b) Mesh Size 4 Inch

Catch fish must have sufficient weight proportions when caught so that they are suitable for capture and do not interfere with their sustainability. The percentage of the total weight of fish capture (Figure 3) with 3.5 inch mesh size proportion of maincatch is 61.1 kg, and bycatch is 133.4 kg. 4 inch gillnet's weight proportion of maincatch is 93.9 kg and bycatch is 110.7 kg. The proportion of main catch weight is smaller than bycatch (HTS> HTU). The proportion of weight as well as the amount of bycatch is high because the fish caught are classified as pelagic fish that swim in groups according to the size and type of other fish. This is like the statement of Jones and Hadfield (1985) that gillnet is a selective capture gear for both species and the size

of fish capture, catches gillnet vary greatly depending on the movement of hordes and fish habitat capture by the net.

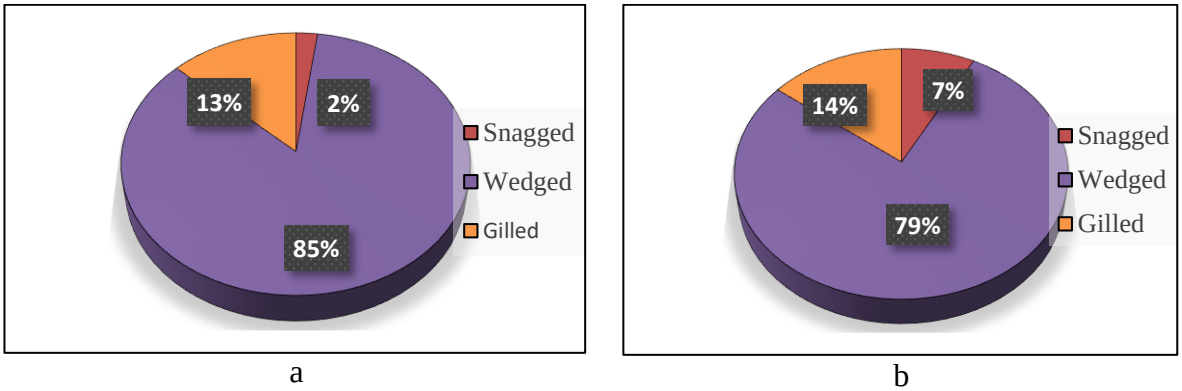
3. 3. Capture Prosess



a b c

Figure 4. Capture Prosess (a) *Snagged*, (b) *Gilled*, (c) *Wedged*

The total catch of mackerel uses gillnet with 3.5 and 4 inch mesh size produce fish capture in three ways, those are snagged, gilled and wedged (Figure 4). According to Queirolo et al. (2013) the way fish capture were classified into four types, first is snagged, fish that capture in the head area in front of the gill lid. The second is gilled, fish that capture in the gill lid. The third is wedged, fish that capture in nets on the back of the gill cover. Fourth entangled, fish that capture caught in the net.



a b

Figure 5. Percentage of Mackerel Capture Prosess using Gillnet (a) 3.5 Inch Mesh Size, (b) 4 Inch Mesh Size

Based on the Figure 5, the capture prosess mackerel using gillnets with a mesh size 3.5 inch dominated by wedged which is equal to 85% as much as 78 fish, and lowest percentage was snagged that is 2% by 2 fish, while mackerel catches using 4 inch mesh size the most dominant capture was wedged is 79% by 76 fish, while the lowest percentage was 7% by 7 fish with capture prosess is snagged. The largest percentage of the capture prosess fish is wedged in both nets, it is because the effect of the size of the net mesh used is greater than the girth of the fish capture so the net can collapse and eventually get caught in the maximum body girth.

3. CONCLUSIONS

Based on the research, it can be concluded that the 3.5 and 4 inch mesh sized gillnet with mackerel catches in Pangandaran Regency are capture prosess in three ways is snagged, gilled and wedged. The most catch is wedged and the lowest is snagged. All fish capture are in good condition, there are only traces of net mesh on the body but do not damage or injure the fish.

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