Catching reef fish using floating traps

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Catching reef fish using floating traps

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Abstract. Floating traps are one of the new fishing gear innovations in Indonesia which are tested to catch reef fish because all this time reef fish are caught using traps which are operated on the bottom of the waters. The floating traps are targeted to be able to catch coral pelagic fish, namely reef fish that always cluster on coral reefs, for example fusiliers (*Caesio* sp). which is usually the target of capture through the use of bombs (blast fishing). So far, floating traps have been used to catch salmon and other pelagic fish such as scads (*Decapterus* sp) and flying fish (*Cypselurus* sp). This research is a basic research which aims to make floating traps as an alternative tool for catching fusiliers. This research was conducted in the waters around Pajenekang Island (Spermonde Islands) from September to ecember 2020. A total of 2 traps(2.4 x 1 x 1 m) were operated around the coral reef at 2 positions, namely at the bottom, and at 2 m from the bottom of the sea. The results showed that there was no difference in catch productivity between traps that were operated at the bottom of the water and traps that were operated at a position 2 m from the bottom of the water. The only difference is in the type of catch, namely grouper (Serranidae) and shrimp (Penaeidae) which are only caught in the bottom of the water and squid (Loliginidae is only caught in the trap 2 m from the bottom of the sea. This shows that reef fish have a vertical distribution from the bottom to the water column. The types of fish caught are Apogonidae, Chaetodontidae, Ephippidae, Holocentidae, Labridae, Loliginidae, Monacanthidae, Nemipteridae, Pempheridae, Penaeidae, Plotosidae, Pomacentridae, Scaridae, Serranidae, Siganidae, Tetraodontidae.

1. Introduction

Trap is one of the fishing gear that is widely used by fishermen of Pajenekang Island to catch reef fish. The type of traps that is widely used is the bamboo trap which is operated on the bottom of the water close to coral reefs. Even the traps are often covered with corals so that they are able to camouflage. However, this method can damage coral reefs. Therefore, efforts are currently being made to obtain a trap that is more environmentally friendly.

Holzman et al. (2007) stated that reef fish are not only on the water bed but also spread several meters above the bottom [1]. Therefore, this study is aimed at testing the operation of the floating trap at a position a few meters above the bottom to see if the device is still able to get reef fish like the traps that are operated on the bottom of the water. Besides that, the floating traps are also expected to catch fish that are the target of blast fishing, namely the fusiliers, so it is hoped that this research will get more environmentally friendly traps.

Floating traps have been widely used in several countries to catch salmon and small pelagic fish such as kite, selar and mackerel [2]. Whereas in Indonesia only a few researchers have tested it around FADs to catch small pelagic fish [3]. The results obtained are satisfactory so that it is hoped that this trap is also able to catch reef fish on the bottom of the waters. Therefore, the operation of floating traps in Indonesian waters and especially on Pajenekang Island is a new innovation.

2. Method

Sampling was carried out around Pajenekang Island near coral reefs from September to December 2020. Pajenekang Island is one of the islands in the Spermonde Archipelago with a geographical position of 4 ° 58'02 " LS - 119 ° 19'44 'East Longitude. This island is an island formed from coral clusters so that coral reefs are around the island up to several hundred meters from the coast. Administratively, this area is Mattiro Deceng Village, Liukang Tupabbiring District, Pangkajene Regency and the Archipelago (Figure 1).

The island is occupied by fishermen who operate puse seine, gill nets, fishing rods and traps. Residents also work as fish traders who buy fish caught by fishermen operating in the waters of the Spermonde Islands. The fish are sold to Makassar City.

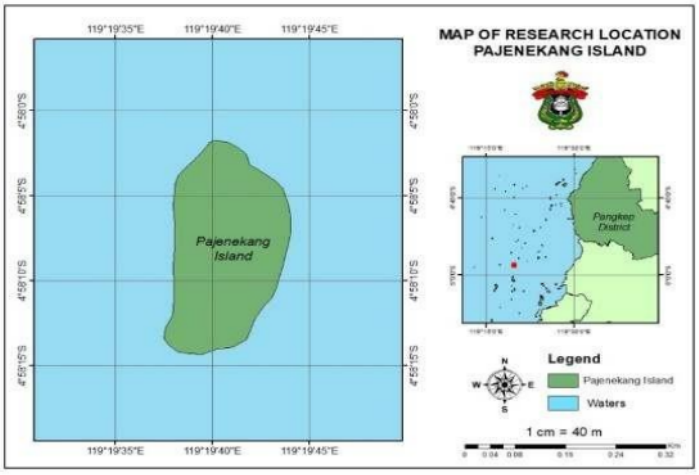

Figure 1. Research Location at Pajenekang Island.

The floating traps used in this study were bottom traps which consisted of two rooms which each had a door so that the dimension of the traps was 2.4 m, 1 m wide and 1 m high. The construction of the floating traps that is placed at the bottom and in the water column is basically the same but there is a difference in the number of buoys used. At the base of the trap, 30 buoys are installed so that they can float, but for balance the pipe frame at the bottom is filled with sand as ballast. In addition, two anchors with short connecting ropes are provided so that the traps can be placed on the bottom of the water (Figure 2).

Figure 2. Floating trap construction.

To be able to place this trap in the water column, there are 6 ball buoys installed on the traps. The floating trap is connected with a $2\sqrt{2}$ m of rope. It is assumed that the resultant buoyancy and horizontal forces generated by the current will form an angle of 45° to the bottom of the water so that the height of the trap is 2 m from the bottom of the water. A rope 15 - 20 m long with a sign buoy is attached to the anchor so that it can be pulled to the surface when taking the trap catch (Figures 3 and 4).

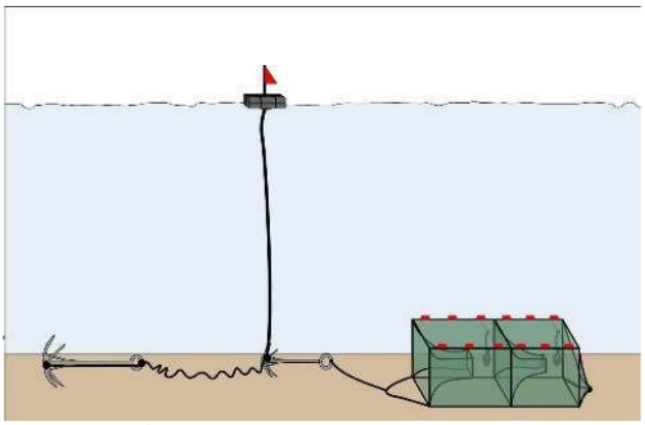

Figure 3. Floating trap at the bottom.

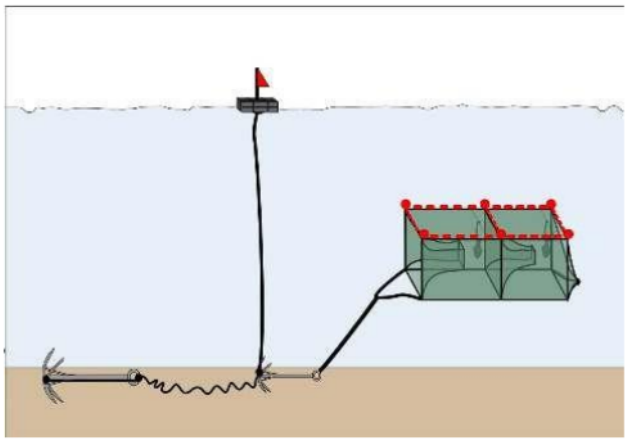

Figure 4. Floating trap at a position 2 m from the bottom.

There are 2 traps that are operated. One is placed at the bottom of the water and another is placed at a position 2 m from the bottom of the water. The two traps were baited with fish meat. Samples were taken every two days. The comparison of the productivity of the two traps was analyzed using parametric *t* - Student test or non parametric Mann Whitney test [4]. The types of fish caught are identified based on the suitability of the image in the Indonesian Market Fish book [5]. The fish are grouped by families.

3. Results

A total of 302 fish were caught using bottom traps and 212 fish caught using traps 2 m above the bottom of the water. The types of fish caught are fish commonly found on coral reefs [6], namely Apogonidae, Chaetodontidae, Ephippidae, Holocentridae, Labridae, Loligonidae, Monachantidae, Nemipteridae, Pempheridae, Penaeidae, Pomacentridae, Plotosidae, Scaridae, Serranidae, Siganidae and Tetraodontidae.

The composition of the types of catch obtained in the bottom traps and traps in the water column is shown in Figures 5 and 6 below. The fish families caught are almost the same in the two traps, but there are types that are only found in certain traps. The Serraidae and Penaeidae families are only caught in the bottom traps and the Loliginidae families are only caught in the traps in the water column.

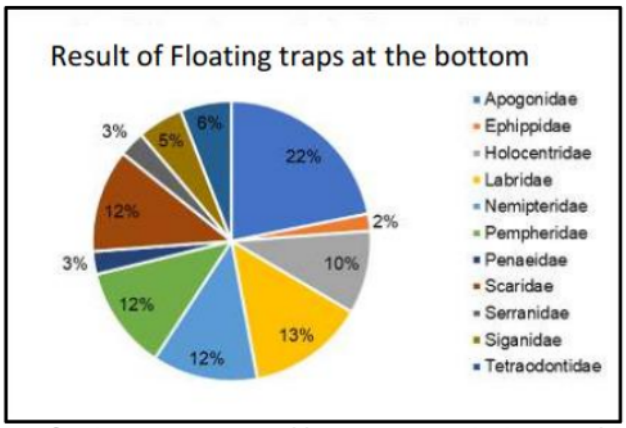

Figure 5. Catching composition of floating traps at the bottom of the sea

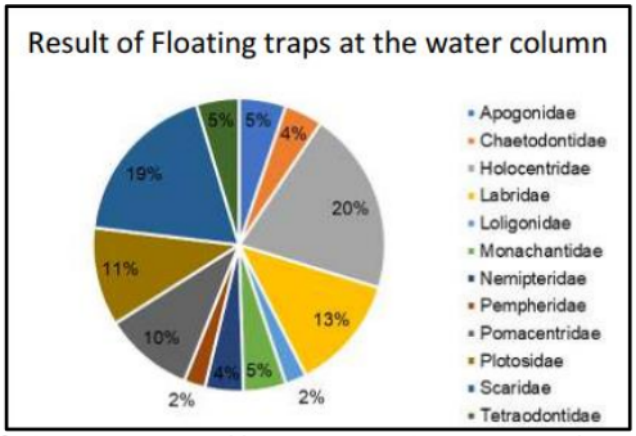

Figure 6. Cathing composition of floating traps at the position 2 m from the bottom.

Based on the Kolmogorov Smi rnov normality test, It is known that the catch data is not normally distributed (<0.05). Therefore, a nonparametric test was used to analyze the difference in productivity between the bottom traps and traps in the water column and there was no difference with the test results of 0.553 (> 0.05).

4. Disscussion

Demersal fish are fish that are always at the bottom of the waters. This is due to the swim bladder so they always have in their position [7]. However they do spread in the water column up to several meters from the bottom of the water [1]. Therefore the catch obtained is no difference between the bottom traps and the water column (2 m from the bottom). Based on this, floating traps can be recommended to catch demersal fish in the water column.

One of the catches that can only be found in the bottom traps is shrimp. Catching shrimp using a trap net has been operated in San Francisci Bay using a deep trap net [8]. In the waters of Pajenekang Island, this bubu does not get a lot of shrimp because these waters are not shrimp habitat like in estuary waters in the estuary [9].

The target catch, namely fusiiers was not obtained in this study. According to local fishermen's explanation, this is due to the fact that the fish population is already very small because many are caught in blast fishing operations, which have been carried out by fishermen from several islands around the island.

One thing that is quite encouraging is the capture of squid, which is only found in traps that are placed at a position 2 m from the bottom. This may make it easier for the squid to lay their eggs. This can be seen from the number of squid eggs that were found attached to the wall of the traps. The type of squid caught is *Sepioteuthis lessoniana* which is a type of squid that lives in coastal areas and coral reefs [10].

5. Conclusion

It was found that there is no difference between the productivity of the floating traps which are operated at the bottom and at a position 2 m from the bottom of the water. Obtained similarities and differences in the catches of the two traps. The difference in catch is that grouper and shrimp are only caught in the bottom traps, while squid are only caught in the traps in the water column.

6. Acknowledgement

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