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THE EFFECT OF USING DIFFERENT COLOR OF LIGHTS TO THE SQUID (LOLIGO SP) CATCH OF BOAT LIFT NET IN BELITUNG REGENCY WATER

M Fikri Riansyah[1], Dedi Supriadi[2], IzzaMahdiana Apriliani[2], LantunParadhita Dewanti[2]

[1]Fisheries Student, Faculty of Fisheries and Marine Science, UniversitasPadjadjaran; Indonesia
[2]Lecturer of Fisheries, Faculty of Fisheries and Marine Science, UniversitasPadjadjaran, Indonesia
Sumedang Km 21, Jatinangor 45363, West Java, Indonesia
E-mail :m.fikririansyah@gmail.com

ABSTRACT

This research aims to analyze the effect of the different light colors used to squid catch on boat lift net in Belitung Regency Waters and to get a good light color in order to caught the optimal squid catch. The researchwas conducted in August to September 2019. Primary data collection techniques using experimental fishing methods, interviews, documentation and using secondary data as a support obtained from the total catch data of boat lift net5 years back obtained from PPN Tanjungpandan. In this research2 boat charts were used which operated alternately for 10 nights. Boat lift net(A) uses the white light colors and boat lift net(B) uses the yellow light colors. Each boat lift net is equipped with 12 fluorescent lamps arranged on the left and right of the boat. The results showed that the use of different colors of light in capturing squid gave a significant difference. White lights caught 2793 squid while yellow lights caught 1251. Boat lift net operated using white lights are more effective at capturing more squid than boats using yellow lights.

Keywords: Belitung, Fishing, Fluorescent Lamp, Lift Net, Lights Color, Squid

1. INTRODUCTION

Belitung Regency is one of the regions that has considerable fishery potential located in WPP-RI 711. One of the fisheries centers owned by Belitung Regency is the Tanjungpandan Nusantara Fisheries Port (PPN). Tanjungpandan waters have important commodity potential fish resources including squid and pelagic fish. According to the time series data obtained from the PPN Tanjungpandan from 2014 to 2018 the squid had a significant increase of 48,019 kg in 2014 and continued to increase until 2018 reaching 804,623 kg [1]. The increasing production value is the reason why squid is an important commodity for Belitungfishermen. This is due to the high market demand for squid and the increasing number of boat lift net fishermen every year is an indication of increased squid production at PPN Tanjungpandan.

Based on fishing gear and fishing areas, Tanjungpandan fishermen use various kinds of fishing gear. One of the fishing gear used to catch pelagic fish is a boat lift net. Boat lift net is one type of lift net fishing gear that is operated using the help of light atractor. Light stimulates organisms such as plankton and other microorganisms to gather near the light. Some fish factors to approach the light can be caused by several things, including originating from the nature of the fish itself to light (positive phototaxis), the desire to find food and the desire to flock to avoid predators [2]. The stimulation of light also affects the presence of predators to approach the boat chart due to food sources [3]. Fishing by using light as a tool is commonly called light fishing [4]. The difference in the color of the lights used in fishing will produce a difference in the number of catches [5]. This is caused by the habits and types of fish that are attracted to the color and intensity of certain lights. Tanjungpandan fishermen use two colors of lights in fishing operations namely yellow lights and white lights.

Light are commonly used during boat lift net operations, with the aim of the fish being targeted as having positive phototaxis [6]. The lamp functions as an attractor for various types of plankton eaters such as anchovies, crustaceans, and other small fish. This will attract predatory organisms to approach the boat lift net and easecatching. The use of different light colors can be used to get the best results in an effort to optimize the fishing result in tanjungpandan waters. Squid has a positive phototaxictrait of light intensity. The intensity of direct light capable of attracting squid (*Loligosp*) ranges from 5-100 lux. If the light is greater than 100 lux, then the squid will not be attracted[7].Based on this statement, further research is needed on the effect of the difference in the color of the lights on the number of squid catches of boat lift net in Belitung Regency waters.

2. MATERIAL AND METHODS

2.1 Research Location

The researchwas conducted in August to September 2019 and located in the waters of Belitung Regency, Bangka Belitung Islands Province. The boat lift net size used in this research is 6 GT. Location of the fishing area used ranges from 7-20 miles from the port presented in Figure 1.

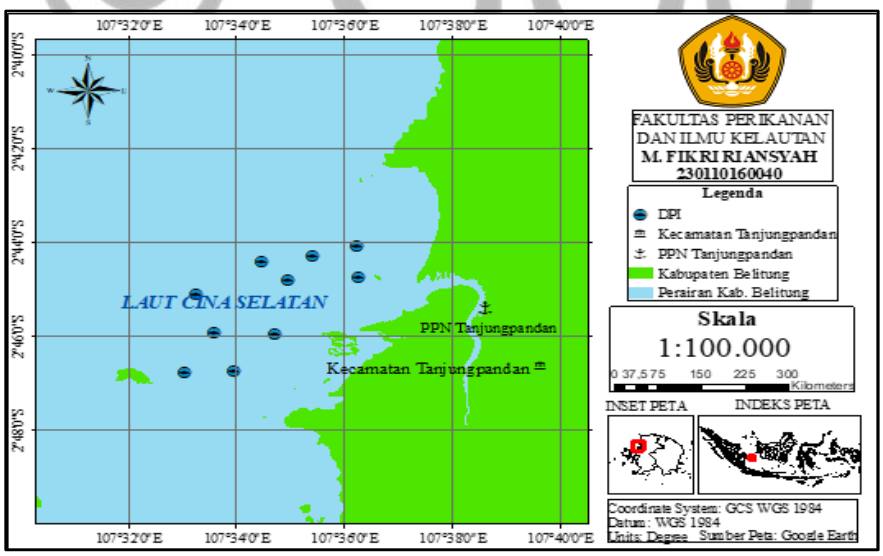

Figure 1. Research Location

2.2 Tools and Material

The tools used in this research are GPS used to determine fishing areas, camera used to record activities during research, stationery used to notethe number of squid catch, 2 boat lift net units as research objects, hand counters to calculate the squid catch, and ArcGIS software used to visualize research location.

2.3 Research Methods

The method used is an experimental fishing method and also a survey method by conducting direct operations in the field. The survey method is an investigation carried out to obtain facts from the symptoms that exist and look for factual information, both

about social, economic, or political institutions of a group or region [8]. The experimental fishing method is carried out with a direct catch trial [9]. The survey was conducted by conducting direct observations by carrying out fishing operations and also where fishermen land their catch where this is the market. The study carried out using 2 units of the boat lift netwhich is one unit using the white light and the other one using the yellow light with 10 replications.Primary data obtained by direct observation to obtain data, conduct interviews to dig up information, in this case the interviewees are fishermen. Documenting by taking pictures directly using the camera to support and visualize the results associated with this research. While secondary data is obtained through supporting data obtained through PPN Tanjungpandan.

2.4Data Analysis

The analysis used in this research is an analysis of the effect of the difference of light color on the squid caught by boat lift net. The data will be analyzed using the t-student test. if the t count is greater than t table 0.05, there is a significant difference between the use of two different light colors. If t count is smaller than t table 0.05 then there is no significant difference in the use of different color lights. The total squid data were analyzed using the t-student test with a test level of 0.05. The hypothesis used is:

- H0 is accepted if the Thitung value ≤ Ttable: there is no significant effect on the use of 2 color lights on the boat chart.
- H1 is accepted if the value of Thitung>Ttable: there is a significant effect on the use of 2 color lights on the boat chart.

The t-student formula used is as follows [10]

$$t_h = \frac{(\bar{x}_1 - \bar{x}_2 - \delta)\sqrt{n_1 n_2 (n_1 + n_2 - 2)}}{\sqrt{(n_1 + n_2)\{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2\}}}$$

Information :

t_h	: The t count value
S_1^2	: White lights standard deviation
S_2^2	: Yellow lights standard deviation
n	: Total data
x_1	: White lights average
x_2	: Yellow lights average

3 Result and Discussion

The squid caught during the study was 4043. The white lights caught 2793 squid and the yellow lights caught 1250 squid. The total squid caught based on the color of the lamp used can be seen in Figure 2.

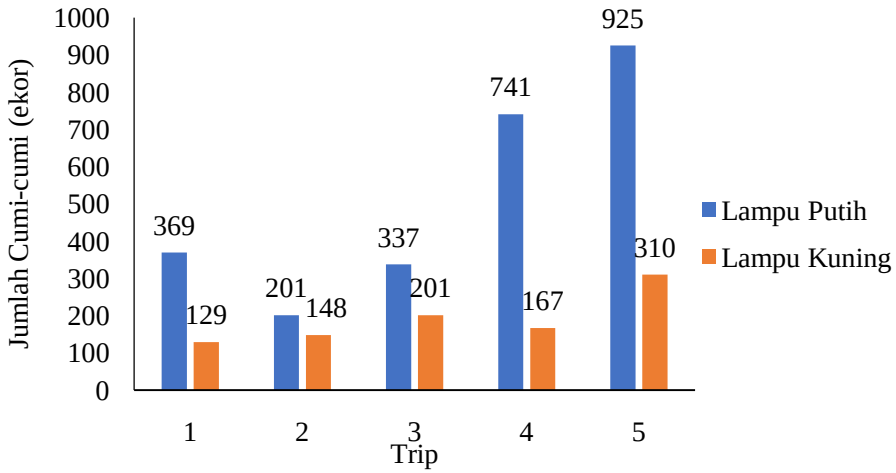

Figure2. Total Squid Catch

The catch from the white light boat lift net gets the most squid. This is because white lights have a higher light intensity compared to yellow lights. Fish have different tolerance limits to light [11]. Light that is too strong will make the fish move away to the right tolerance limit. Fish interest in light sources varies between types of fish. The difference is generally caused by differences in phylogenetic and ecological factors, as well as the physical characteristics of the light source, specifically the level of intensity and wavelength [12].

Based on these results the squid catch is quite a lot, because squid is an aquatic animal that is active at night to find food coupled with the use of light making squid squid are moving in the direction of available food sources. The intensity of the light used in the chart affects the catch, where the intensity of the light usedatract plankton to come closer to the boat so the number of catches will increase [13]. Squid can be caught on the boat lift net due to food factors namely plankton which gather under the light beam. Food availability will affect the abundance, migration and distribution of squid [14].

Squid live in group (schooling) and active to eat at night. The average number of squid caught on the yellow light is 250 squid per trip and the white lights are 558 squid per trip. This becaused the waves in August began to be high, so that fishermen did not catch fish far from the coast which is a fishing ground so that the fish caught in the PPN Tanjungpandan area are few. The use of light in fishing serves to help gather fish in the waters to approach the light so that easily caught by fishermen. Several things, including the nature of the fish, can cause the attraction of the fish to approach the light itself towards light (positive phototaxis), the desire to find food and the desire to flock to avoid predators [15]. This happens because of the cycle of eating each other (food chain) between small fish and predators that are larger to get food for example, squid as predators and anchovies are prey fish [16]. Water organisms respond faster to light when they are hungry than when they are full [17].

The highest season for catching squid occurs in October-March and the peak occurs in November [18]. Abundance of squid in a waters will increase during the rainy season [19]. This is caused by the presence of food sources in the form of plankton which is very abundant. Some Tanjungpandan fishermen, especially boat lift net still carry out fishing operations during the bright moon but only fishing near the port. The results show that when the light intensity using a different color of the light on the boat lift net affects the catch, squid catch are said to be pretty much seen from the results because the squid is a water animal that likes at night and is active at night to look for food. Small fish and crustaceans are the main food of squid that causes squid to gather.

The results of data analysis using the t-student formula obtained T count (1.88451) is greater than Ttable (1.85955) where the use of white lights and yellow lights gives a significant effect on the squid catches. This can be seen from the difference in the total squid caught between white lights and yellow lights. The white squid catch has a greater total weight than the yellow light

4. Conclusion

Based on the results of the t-student test in terms of the number of individuals using white lights and yellow lights gives a significantly different effect. Thit value (2.31529) is greater than Ttab (1.85955) so that the value of H0 is rejected, meaning that the use of white lights and yellow lights has a significant (significant) effect on the squid catches. The total number of individuals caught on white lights was 2,573 with an average of 515 individuals / trip while the yellow lights were 955 individuals with an average of 191 individuals / trip.

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