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HAULING TIME'S INFLUENCE ON CATCHES WITH SET LIFT NET AT PANGANDARAN WATERS

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ABSTRACT

This research was conducted to determine the best hauling time for the catches obtained by using a set lift net. The research was conducted in September 2017 at the East Coast of Pangandaran. The method used in this research is the experimental method. The study consisted of 2 treatments and 3 replicates. Necessary data in this research include primary and secondary data. Primary data was taken by following trip of fisherman. The data obtained include total weight of catch, total weight per fish type and water quality parameters in-cluding water salinity and temperature. Secondary data in the form of literature study by comparing the literature or the research result in accordance to the theme. The data obtained were analyzed by using t-student test. The results showed that the total of catch's weight is more prevalent during hauling after midnight and the highest catch rebon shrimp were obtained on trip 15 with the total weight of 243 kg. The main catch obtained during the research was rebon shrimp.

INTRODUCTION

Pangandaran is an area directly facing the Indian Ocean, this conditions greatly affect the oceanic characteristics of the waters. Besides being a tourist spot, Pangandaran area is also an area that has the potential of capture fisheries. There are various types of fishing unit operated by Pangandaran fishermen, like bottom gillnet (monofilament gillnet), nylon net (multifilament gillnet), three-layer net (trammel net), longline fishing, beach seine, Danish seine and lift net, according to the Dinas Kelautan dan Perikanan (DKP) of Ciamis Regency (2012) lift net is a net fishing device operated in coastal waters at night using light as a fish pull factor (Mulyono 1986). Lift net is a fishing gear that has been used for a long time by Pangandaran fishermen for fisheries activities, a lift net used by fishermen Pangandaran which is a set lift net and also a floating lift net.

The set lift net is a rectangular bamboo arrangement embedded in the bottom of the water, in the middle of the bamboo arrangement there is a net. Pangandaran fishermen operate fishing gear starting from the afternoon they have made preparations and started making arrests around 6:00 p.m. to 5:00 p.m. On one night, fishermen can lift the hauling to 3 to 5 times. The operation of the set lift net is affected by light. Light stimulates the fish to approach and gather at the light source. This event utilizes one of the fish's behavior to catch the fish itself. The function of light in fishing is to collect fish to a certain catchable area, then fishing is done by means of nets or fishing rods and other tools (Sudirman and Mallawa 2004). Species fish that are positive phototaxis are anchovies.

Anchovy is the most dominant fish in the catch of the set lift net because the anchovies live in colonies. The main food of anchovies are plankton, plankton will breed and live well because of the light from the lamp. The abundance of plankton that is high below the lift net will attract anchovies to gather for food (Basmi 1995). The type and weight of fish caught by the fishing gear obtained by Pangandaran fishermen is different depend on the time of hauling. Based on this, conducted research of Hauling Time's Influence on Catches with Set Lift Net at Pangandaran Waters.

METHOD

This research was conducted in September 2017, data was taken by following trip of Pangandaran fisherman. The tools used at the time of the study were 5 units of set lift net, GPS (Global Positioning System), scales, thermometers, and digital cameras. Primary data collection is carried out during the dark moon phase for 15 days, on September 9th, 10th, 11th, 12th, 13th, 15th, 17th, 18th, 19th, 21st, 22nd, 23th, 28th, 29th, and 30th 2017.

The method used in this research is the experimental method with 2 treatments and 3 replicates. The treatment used is hauling time, which consists of:

A = Hauling with the time before midnight at 7:00 p.m. to 11:30 p.m.

B = Hauling with time after midnight at 00:30 a.m. -05:00 a.m.

Data on the number of individuals and the weight of catch in this research were analyzed by using t-student test, while the data about temperature were analyzed descriptively.

The formula used in the t-student test is

$$t = \frac{Y1-Y2}{\sqrt{S/n}}$$

Information :

t	: Deviation from mean value
Y1	: Fish catch (hauling time before midnight)
Y2	: Fish catch (hauling time after midnight)
S	: Standard deviation
n	: Total number of replies (15 times)

If t count is greater than t table 0.05 then there is a difference in catch between the time of hauling before midnight and after midnight. If t count is smaller than t table 0.05 then between treatments does not show a significant difference.

RESULT AND DISCUSSION

4.1 Total Weight of catch

Research conducted in September 2017 on the East Coast of Pangandaran shows that the most dominant main catch is Rebon shrimp because the waters are in the season of Rebon Shrimp. So the fishermen make Rebon shrimp as the main target of arrest. The fish caught by fishermen are different on each trip (Table 1).

Table 1. Total Weight of Catch Per Trip

Trip	Catch (Kgs)						Total
	Rebon	Layur	Squid	Teri Lanad	Layang	Petek	
1	120	5,8	1,6	-	-	-	127,4
2	37,6	13,8	0,2	-	-	2,6	54,2
3	168	5,1	1	0,3	-	0,3	174,4
4	6,7	4,9	0,2	-	0,8	-	12,6
5	8,1	-	0,5	-	-	0,4	9
6	74,3	1,7	0,9	-	0,8	-	77,7
7	31,6	1,5	0,2	6,6	5,4	1,9	47,2
8	64,2	3,6	0,8	9,6	1,1	1,3	80,6
9	80,1	1,9	0,5	-	1,4	-	83,9
10	3	1,5	0,4	-	-	-	4,9
11	13	2,4	0,3	-	-	-	15,7
12	70	0,5	1,1	1,5	-	-	73,1
13	44	3,9	0,2	-	-	3,2	51,3
14	176,6	3,7	1,3	14,2	3,2	2,6	201,6
15	243	2,6	0,4	4,3	-	-	250,3
Total	1.140,2	52,9	9,6	36,5	12,7	12,3	1.265,7

During the research activities, the total weight of catch was 1265.7 kgs. Table 1 shows that the catches are unstable, the catches are caught most during the research activities, namely on trips 3, 14, and 15. The catches on trip 3 as much as 174.7 kgs consisted of 168 kgs rebon shrimp, 5.1 kgs layur. , 1 kgs squid, 0.3 kgs petek, and anchovy as much as 0.3 kgs. On trip 14 the total catch of 201.6 kgs consisted of rebon shrimp 176.6 kgs, 3.7 kgs layur, 1.3 kgs squid, anchovies 14.2 kgs, flyovers 3.2 kgs, and petek as much as 2 , 6 kgs. On trip 15 which was a trip with the highest catch of 250.3 kgs consisting of 243 kgs of rebon shrimp, 2.6 kgs of layur, 0.4 kgs of squid, 4.3 kgs of anchovies. While the catches with the least amount are on trips 4, 5 and 10. On trip 4 the catch of 12.6 kgs consists of 6.7 kgs of rebon shrimp, 4.9 kgs of layur, 0.2 kgs of squid, and 0.8 kgs of flying fish. On trip 5 the amount of catch as much as 9 kgs consisted of 8.1 kgs of rebon shrimp, 0.5 kgs of squid, and 0.4 kgs of petek fish. Trips with the least number of catches were trip 10 with a total of 4.9 kgs consisting of 3 kgs of rebon shrimp, 1.5 kgs of layur, and 0.4 squid.

Total catches per trip get different results due to several factors such as the location and rain. The location of the research was carried out differently with the aim of obtaining maximum results because the fish estuary was different. High rainfall makes the

water quality parameters in the East Coast Pangandaran decrease which resulted in disruption of the fishing process and the decline of the catch fish.

4.2 Water Conditions

The number of catches during the research fluctuated, one of the causes of these fluctuations was a decrease in temperature and salinity.

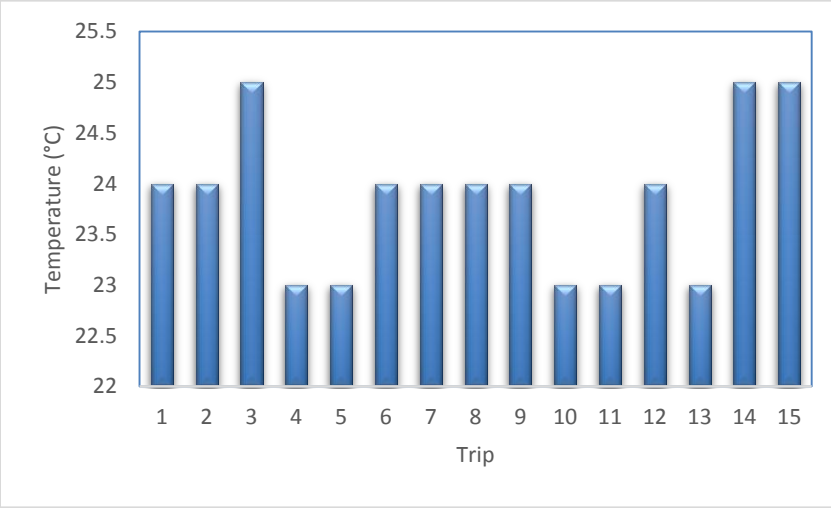

Figure 1. Temperature in Pangandaran Waters During the Research

Comparison chart of water temperature shows that each trip has a different temperature, on trips 3, 14 and 15 experiencing the same temperature of 25 ° C (Figure 3), indicating that the temperature of 25 ° C is the optimum temperature for rebon shrimp habitat. On these trip, the rebon shrimp that was obtained was very large and on trips 1, 2, 6, 7, 8. 9 and trip 12 had the same temperature of 24 ° C and the catch could be said to be close to good. The data obtained are in line with those stated by Holdich (2002) that shrimp larvae can grow well in the optimum temperature range 24 - 31 ° C. At temperatures below 24-26 ° C the shrimp larvae cannot grow properly and the time of metamorphosis is longer. The dramatic temperature changes will cause death in shrimp larvae, but gradual changes do not have much effect on the life of shrimp larvae. High temperatures tend to cause dissolved oxygen levels to decrease. Temperature and calcium are variables to control the growth and survival of shrimp. However, the decrease in water temperature occurs on trips 4, 5, 10, 11 and 13 caused by rain and high rainfall which makes the temperature decrease from to 23 ° C which results in a decrease in the number of fish caught.

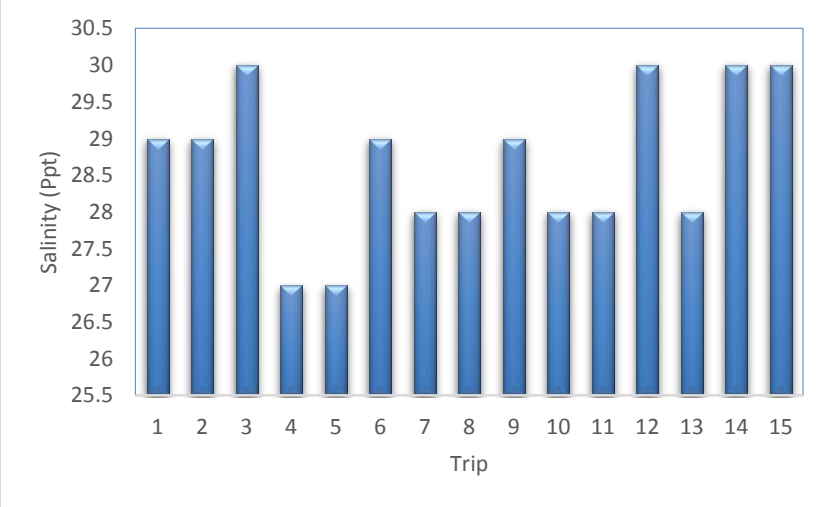

Figure 2. Salinity in Pangandaran Waters During the Research

Salinity is the level of salts dissolved in sea water. Salinity is influenced by several factors such as evaporation and rainfall. Comparison of water salinity on trip 3, 14 and trip 15 has a salinity level of 30 ppt which results in a large number of catch fish (Figure

4). However, there was a decrease in water salinity on trips 4 and 5, which was 27 ppt. This is due to the occurrence of rain in these waters which makes salinity decrease and the fish catches obtained decrease as well. Hutabarat and Evans (1984) state that salinity is more stable in the open ocean, although in some places there are changes. Salinity will increase because the amount of water lost during evaporation in the summer or vice versa will decrease by the amount of rainfall. The increase in water salinity occurs in trip 6 to trip 9 which makes the catch fish increase.

4.3 Comparison of Total Weight of Catches

Based on the research that has been done, it can be seen that there are differences in the number of catches between treatment A (hauling before midnight 07:00 p.m. – 11:30 p.m.) with treatment B (hauling after midnight 00:30 a.m. – 05:00 a.m.), can be seen in Table 2 below:

Table 2. Comparison of Total Weight of Catches

Trip	Before Midnight (Kgs)	After Midnight (Kgs)
1	**66,3**	**61,6**
2	**8,2**	**46**
3	**20,3**	**154,4**
4	5,3	7,3
5	0,9	8,1
6	**45,3**	**32,4**
7	**18,3**	**29,1**
8	**28,4**	**52,2**
9	**29,3**	**55,4**
10	4,6	0,3
11	14	1,7
12	**18,6**	**54,5**
13	49,4	1,9
14	**85,9**	**115,7**
15	**105,7**	**144,6**
Total	**500,5**	**765,2**
Average	**33,4**	**51**

The fish caught after in every trip after midnight is bigger than the catch before midnight. In treatment A (Hauling before midnight 07:00 p.m. – 11:30 p.m.) obtained as much as 500.5 kgs and treatment B (Hauling after midnight 00:30 a.m. – 05:00 a.m.) was obtained as much as 765.2 kgs (Appendix 1 and Table 2). The difference between the two total weights is 264.7 kgs only on trips 1, 6, 10, 11 and trip 13 the number of catches before midnight is more. Haruna (2010) states that some types of fish such as tembang, anchovies and kites will fully adapt to light after midnight, before midnight is the time for fish to fully adapt to light. Positive phototactic fish when the environment has turned darker will be attracted by artificial light (lights). According to Akbar et al. (2013), rebon shrimp is a small type of shrimp that lives in shallow and muddy coastal waters and is a type of shrimp that has positive phototoxic properties. Positive phototaxis is shrimp behavior that is attracted to light sources. The fish that are not positive phototactic caught by the step chart are predatory fish that prey on the rebon shrimp so that they are caught by the fishing trap.

4.4 Total Weight Per Fish Type

The catch of the step chart during the study amounted to 6 types. The research that produced 6 catches was obtained after 15 trips. Rebon shrimp (Acetus indicus) is the main catch and is the most caught species, as many as 1,140.2 kgs. The next type of catch is 9.6 kgs squid (Loligo sp.), 12.7 kgs flying fish (Decapterus koheru), 52.9 kgs layur fish (Trichiurus sp.), Petek fish (Gazza dentex) as much as 12.3 kgs, and teri lanad (Stolephorus sp.) as much as 36.5 kgs, (Table 3).

Table 3. Average Weight of Catches Based on Fish Types

Types of Fish	Total Weight (Kgs)
Rebon	1.140,2
Layur	52,9
Squid	9,6
Teri Lanad	36,5
Layang	12,7
Petek	12,3

The number of fish caught above shows that set lift net is a fishing device that can be used well to catch small pelagic fish such as catching shrimp. Set lift net is good at capturing Rebon Shrimp because the catch is more dominant than the other catches.

There are several types of catches that are not caught by the set lift net, and there are types of catches that are thrown back into the waters after being caught, for example baby lobsters because they are prohibited by the government.

4.5 Comparison of Catches in Different Hauling Times

Rebon shrimp is the most dominant main catch caught by set lift net. The fishing gear uses lights as a fishing aid to attract positive phototactic fish to get closer to the light source, such as rebon. Therefore, rebon is the main catch of a chart that uses lights as a tool.

Table 4. Hauling Time of Rebon shrimp Per Trip Catch

Hauling	Trip (kgs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Before Midnight															
Hauling 1 (07:30 p.m.)	23	-	11	-	-	6,3	-	14,2	-	-	-	-	26	28	28
Hauling 2 (09:30 p.m.)	10	-	7	-	-	38	1,3	-	12,4	3	13	-	18	23	35
Hauling 3 (11:00 p.m.)	33	-	-	-	-	-	4,5	-	14,3	-	-	16	-	13,6	38
After Midnight															
Hauling 4 (01:30 a.m.)	13	12	21	6,7	-	8	2,8	-	12,2	-	-	8	-	33	38
Hauling 5 (03:00 a.m.)	30	18	128	-	4,9	-	23	42	33	-	-	40	-	60	78
Hauling 6 (04:30 a.m.)	11	7,6	1	-	3,2	22	-	8	8,2	-	-	6	-	19	26
Total	120	37,6	168	6,7	8,1	74,3	31,6	64,2	80,1	3	13	70	44	176,6	243

From Table 4, we can see the weight of the fish caught by Rebon shrimp from each trip, the biggest catch of rebon shrimp is on trip 15 with weight of 243 kgs, trip 14 with weight of 176.6 kgs and trip 3 with weight of 168 kgs, fish the fewest catches are trip 4, 5 and trip 10 which are 6.7 kgs, 8.1 kgs and 3 kgs (Table 4). Rebon shrimp as the main catch is more dominant than before midnight. The Rebon shrimp catch is also influenced by other lights such as moonlight, moonlight that illuminates the waters makes more light into the waters which makes rebon shrimp more attracted to light sources and makes Rebon Shrimp cluster to avoid predators so

more caught rebon shrimp.

Based on the results of the t-student test conducted on the total weight of the catch (Appendix 1) it is known that thit is 22 greater than ttab 0.05 at 1.75 (thit> t0.05) then research at hauling before midnight (08:00 p.m. – 11:30 p.m.) and after midnight (00:30 a.m. - 04:00 a.m.) have a significant (significant) effect on the catch because there is a difference in the total weight of the catch between before midnight (08:00 p.m. - 11:30 p.m.) and after midnight (00:30 a.m. - 04:00 a.m.).

Conclusion

The research concluded that the optimal hauling time for set lift net on the East Coast of Pangandaran waters was at the time after midnight (00:30 a.m. – 05:00 a.m.) with a total catch of 758.54 kgs.

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