Temporal Distribution and Nike Fishing Techniques at the Estuary of the Bone River

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Abstract

This study aims to determine the pattern of temporal distribution and fishing techniques of Nike (Awaous sp.) In Gorontalo City. The research was conducted in October 2016 to January 2017 (Muharram to Jumadil - Early 1438 H). The method used is the method of random sampling and interviews. From the research results it is known that the temporal distribution pattern of Nike fish <1 means that the distribution pattern is random. Nike fishing is done by using three types of fishing gear namely; spoonful, tutaluo and tagahu. Where the snail and tutaluo fishing gear are operated by scooping nike fish in the waters, while tagahu is operated by circling the hordes of nike fish in the waters.

Keywords: nike; Awaous sp.; temporal; distribution; fishing techniques.

Introduction

Bone River Estuary is a meeting place for three rivers, namely Bolango River, Bone River and Tamalate River. This estuary is also a connecting path between the three rivers and Tomini Bay. Bone River Estuary is the entrance and exit of fishing boats from the mainland to the sea (Mulerli, 2007).

Bone River Estuary has sufficiently diverse fisheries resources, one of which is the attention and interest of the surrounding community, namely nike (Awaous sp.), Where the fish species appear at the end of each month in the Qomariah calendar with a place of fishing that is not settled (Doe, et al, 2014). There are several factors that need to be known to make use of nike fish resources, including knowing the presence and distribution patterns of nike fish, and nike fishing techniques.

The existence and distribution of nike fish need to be known given the relatively changing locations of nike fish, besides knowing the existence and distribution patterns of nike fish can help fishermen and the community more effectively and efficiently in catching. The determination of fishing techniques is also very influential on the catch that will be obtained. Some information obtained from the community that the types of fishing gear used in catching Nike is quite diverse and has a unique fishing technique on each type of fishing gear. The types and techniques of fishing need to be known in order to obtain optimal catches, besides knowing the types of fishing tools and techniques can facilitate the community in catching and minimizing the occurrence of misuse of fishing gear. Considering the many benefits obtained from knowing the existence and pattern of distribution as well as the type of fishing gear used to catch nike, it is necessary to conduct research on the patterns of temporal distribution and nike fishing techniques at the Bone River estuary in Gorontalo City.

This study aims to determine the pattern of temporal distribution and fishing techniques of Nike (Awaous sp.) In Gorontalo City.

Research Methodology

This research was conducted around the mouth of the Bone River Gorontalo City Gorontalo Province. This research lasted for three seasons of Nike fishing, namely, in October 2016, until January 2017. The determination of the sampling location was based on information from nike fishing fishermen who were around the time and location of the location where the nike fish often appeared. in the region. For the location in this study, it is divided into three station

regions namely; Station I. Kelurahan Leyato Utara, in front of the mouth of the mouth of the Bone Staiun II River. Talumolo Village, the direction of the Bone River to the upstream part and Station III. Tent / Customs Village part of Bone River which is adjacent to the mouth of the river flow from the Limboto lake area. The research location is presented in Figure 1.
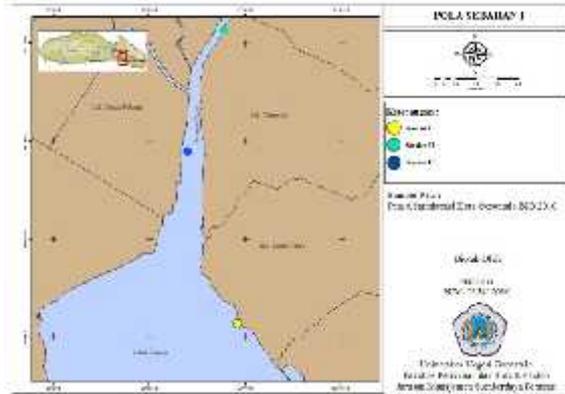

Figure 1 Map of research site

This research is a qualitative descriptive study, according to Sugiyono (2013) a qualitative descriptive study aimed to uncover events or facts, circumstances, phenomena, variables, and circumstances that occur when the research takes place by presenting what actually happened. In addition, this research requires a variety of supporting sources, for example, prior information about the object of research to strengthen data analysis (Saputro, 2012). Sampling in this study used a random sampling method, where previously the administrative areas were determined using GPS (Global Position System) then randomization was carried out within the region.

The tools and materials used in this study are the GPS (Global Position System) application as a tool in determining the coordinate point where nike fish appear, then nike fish sampling is done using a scoop with a length of 50 cm and width of the mouth opening of the net 20 x 20 cm, an empty bottle that has been tied with a 2 meter long rope as a tool to measure the parameters of the current speed, a stopwatch to calculate the current speed and as well as a writing instrument to record measurement data and sampling obtained at the study site. Furthermore, data collection on temporal distribution patterns and

techniques of capturing in the field are carried out in the following stages;

Sampling aims to see the time and number of nike fish catches at each location. Samples were taken using a scoop that has been made with a pocket length of 50 cm and a width of 20 x 20 cm net mouth opening with a 2 meter long wooden gutter by dipping the scoop into the water within 5 minutes to better suit the fishing techniques carried out by fishermen. These tools and methods are commonly used by fishermen to catch nike. Furthermore, the samples obtained, calculated and recorded the results to be processed as nike fish distribution data. Nike sampling is done in a suburb near the estuary waters of the Bone River with a depth of 1 to 2 meters by going down directly to the waters and taking samples.

Flow velocity measurements are also carried out in order to determine the relationship of currents to the displacement of the emergence of nike fish in waters near the mouth of the Bone River.

To obtain data on Nike fishing, researchers submit interviews that refer to the list of questions. Some questions asked at the interview included; 1). A brief history of Nike fishing gear, 2). The size of the fishing gear used, 3). Types of fishing gear used in making arrests, 4). Fishing gear operation techniques and 5). Aids in catching operation.

The pattern of temporal distribution of nike in this study was determined using the Morisita index analysis (id) and descriptively. This index is not influenced by the sampling station, and is very good for determining population distribution patterns of an organism (Endrik et al., 2010). Morisita index analysis is to determine the distribution pattern of nike fish based on the time of occurrence around the estuary waters of the Bone River, Gorontalo City. The use of the Morisita index is commonly used in studies of the distribution patterns of aquatic organisms. The Morisita calculation formula follows Brower et al., (1990).

Fishing techniques obtained later will be presented in a descriptive form. According to Sugiono (2013) descriptive analysis is a part of statistics that reveals facts, circumstances, phenomena, variables

and circumstances that occur during research by presenting what actually happened.

Results and Discussion

Located around the estuary of the Bone River in Gorontalo City, where the location of Station I is located in the Leyato Kelurahan which is located in front of the Bone River estuary precisely at sea, for Station II it is located at Kelurahan Tenda / Customs which is a meeting between the flow of rivers originating from Lake Limboto and the Bone River. While Station III is located in Talumolo Village, precisely in the area near the Talumolo bridge towards the upstream of the Bone River. The Bone River region is actually divided into two Kelurahans which are on the west bordering the Kelurahan Tenda and on the east bordering Kelurahan Talumolo and the mouth of the river (estuary) directly facing the Kelurahan Leyato Utara and the Tomini Bay.

The results of sampling conducted at three stations during the three months of the Nike fish season obtained a total of 187 fish in which in the first month of the Nike season there were 85 fish, the second month was 37 fish and the third month was 56 fish. The amount obtained in each station area is presented in Table 1.

Table 1 Sampling results

Nike Sampling Data for 3 seasons				
Seasons	Station I	Station II	Station III	Number
1	49	20	16	85
2	24	13	0	37
3	31	25	0	56

Source. Primary Data (2016)

Tempopral distribution

In general, it is well known that Nike is a small fish, whitish and has dark lines on its body. Nike comes from the sea and migrates into the river. Some of the first frequent occurrences of Nike fish occur in Tanjung Keramat and Leyato Utara. But specifically, until now there is not much known the effect of changing the time of emergence and where the emergence of nike fish.

During the three seasons of emergence of nike it was known that in October - December 20016 (Muharram-Rabi'ul-Awwal 1438 H) the first Nike fish appeared in the region of North Leyato Village adjacent to the ferry port.

Table 2 Morisita index calculation results of the distribution pattern of nike in the first season in October 2016 (Muharram, 1438 H)

Stations	N	x	N	n(xi²-N)	N(N-1)	n(xi²-N)/N(N-1)	Remarks
1	3	49	85	7118	7140	0.997	Random
2	3	20	85	1115	7140	0.157	Random
3	3	16	85	683	7140	0.096	Random

Source: Primary Data (2016).

Table 3 Morisita index calculation results of the distribution pattern of nike in the second season in November 2016 (Shafar, 1438 H)

Stations	N	x	N	n(xi²-N)	N(N-1)	n(xi²-N)/N(N-1)	Remarks
1	3	24	37	1691	3108	0.544	Random
2	3	13	37	470	3108	0.151	Random
3	3		37				

Source: Primary Data (2016).

Table 4 Morisita index calculation results of the distribution pattern of nike in the third season in December 2016 (Rabi'ul-Awwal, 1438 H)

Stations	N	x	N	n(x-N)	N(N-1)	n(x-N)/N(N-1)	Remarks
1	3	31	56	2827	4704	0.601	Random
2	3	25	56	1819	4704	0.387	Random
3	3		56				

Source: Primary Data (2016).

From the results of measurements in 3 consecutive seasons obtained the results of the distribution pattern of the nike fish at the same station points can be seen that in the first season the nike fish spread occupies Station I, II, and III. While in the second and third seasons Nike fish spread and only appeared at Station I and II, it is not yet known the cause of the absence of emergence at Station III in the 2nd and 3rd seasons.

Furthermore, for three seasons at each station it was shown that, the first season at Station I amounted to 49 with a Morisita index value of 0.997, Station II amounted to 20 with a Morisita index value of 0.156 and at Station III amounted to 16 tails with a morisita index value of 0.096. Furthermore, in the second season the results obtained at Station I amounted to 24 tails with a Morisita index value of 0.544, Station II numbered 13 tails with a Morisita index value of 0.151 and at Station III no samples were found. In season 3 Station I totaled 31 heads with a Morisita index value of 0.601, Station II totaled 25 heads with a Morisita index value of 0.387. From the results obtained, it can be seen the temporal distribution pattern of Nike fish <1 means that the distribution pattern is random. The pattern of random spread also occurs due to positive competition between individuals, so that it will encourage the formation of the division of space between these individuals (Furry, 2011).

Description of fishing gear

Tutaluo fishing gear has 4 parts namely; 1). wood serves as a buffer net as well as the opening mouth of the net, for a wooden length of 2.5 meters, 2). the mouth of the net serves as the entrance of the fish in the bag, while for the mouth opening area of the net is 2 meters, 3). net part of the bag serves to accommodate the catch caught in the net, the total length of the net up to a bag of 6 meters, 4). The net strap functions as a mesh and wood. The net mesh size as a whole is # 1 mm with mosquito nets. Pictures of tutaluo fishing gear are presented in Figure 2.
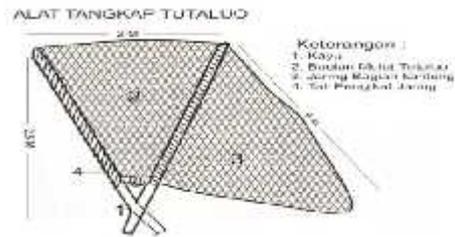
Figure 2 Tutaluo fishing gear

In general, the shape of the beach and deep sea tagahu is the same, what distinguishes the two types of fishing gear is the operating aids and the location of the depth in conducting operations, as well as the shape of the length of the net that is adjusted to the depth of a waters. Which allows fishermen to catch nike according to the desired conditions (Figure 3).
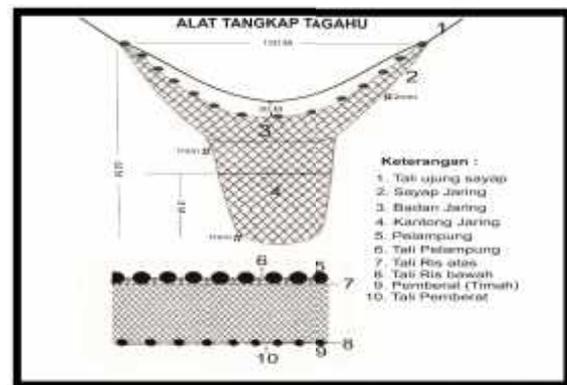

Figure 3 Parts and construction of tagahu fishing gear

Sererok is a kind of Scoop Net (Sudirman, 2013). A cone-shaped net or bag, the mouth of the net opens using a frame made of rattan or bamboo. While the scoops used by fishermen around the study site are frames made of wood and rattan. For the slippery size used by fishermen around the study site, it has a bag length of ± 2 meters with a mesh size of # 1 mm, a wooden handle handles ranging from 0.5 meters to 1 meter according to the needs of the fishermen users, as well as the opening mouth of the net ranges between 0.7 meters to 1 meter (Figure 4).
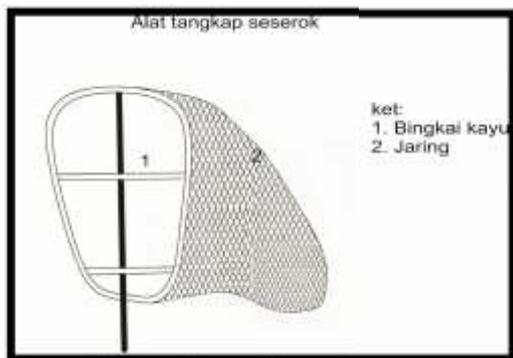

Figure 4 Description of seserok

Conclusion and Sugges

The temporal distribution pattern of nike fish in the estuary waters of the Bone River Gorontalo City during October to December 2016 (Muharram to Rabi'ul-Awwal, 1438 H) is random, with the time of occurrence at the end of the lunar month.

The technique of catching nike in the estuary waters of the Bone River in Gorontalo City, is done by circling the hordes of nike fish using tagahu and scooping using a spoon and tutaluo.

It is recommended that further research related to biological aspects, especially regarding the classification and influence of water physical-chemical factors on changing locations and times of occurrence of nike fish.

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