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Density Population and Growth Pattern *Hemibagrus nemurus* (Valenciennes 1840) in Bilah River

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Abstract

The purpose of this study is to find out the bioecological aspects of Asian Redtail Catfish (*Hemibagrus nemurus*) in Bilah river, Labuhanbatu regency, this study uses purposive sampling method. Correlation of physical and chemical factors of the waters with population density, growth patterns, population density, and genital ratio of *H. nemurus*. In this study the determination of observation stations as the location of sampling of fish using purposive sampling. The result showed population of *H. nemurus* from station 1 found (6 individual/m^2), station 2 found (12 ind/m^2) individual fish, station 3 found (12 ind/m^2), station 4 found (14 ind/m^2), at station 5 found (12 ind/m^2), at station 6 found (6 ind/m^2), at station 7 found (10 ind/m^2) individual, at the station 8 found (8 ind/m^2) and station 9 found (8 ind/m^2). The density of Asian Redtail Catfish population in the central Bilah river were obtained between 0.03 - 0.07 individuals/m^2, and the Growth Pattern of the length and weight of Asian Redtail Catfish Fish result were positive allometrics (b = 3,136). Growth can provide information about the relationship of length-weight and chemical physics factors in the water of Bilah river. This is a very important effort in the management of fish growth patterns in Bilah river waters and as an information base for the management of sustainable fishery growth patterns

Keywords: *Hemibagrus nemurus,* Bioecological, River Fish, Bilah River

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INTRODUCTION

Asian Redtail Catfish fish (*H. nemurus*) is one of the commodities of fish in public waters that have important economic value, which is found in many watershed of Sumatra, Java and Kalimantan (Robert, 1989). This fish is one of the local species that has been cultivated since 1980, both in ponds and in bamboo cages (keramba) using seeds from stangkapan in nature (Kusdiarti et al., 2020; Suryanti & Priyadi, 2002).

H. nemurus became a special seafood in several Labuhanbatu regency restaurants. This fish has an important economic value because the selling value is quite high, currently the price in the local market ranges from Rp. 35.000,- up to Rp 45.000,- a kilograms in fresh condition, according to Yudha et al, (2018) In Pelembang City the price in the market ranges from Rp. 20.000,- a kilograms in the form of fresh fish, and becomes even higher in the form of smoke fish with price Rp.100.000,- a kg. Because these Catfish is one of freshwater fish that is very popular by the community and has high economic value, the utilization rate increases. If this is allowed, it can lead to a decrease in the *H. nemurus* population in watershed such as in Bilah river.

The Bilah river is the largest river in Labuhanbatu Regency of north Sumatera province. This river is a large river with many community activities, such as sand mining, drinking resources water company of goverment (PDAM), agriculture or fisheries, transportation and also a source of drinking water for people in Labuhanbatu Regency (Harahap, 2019). The Bilah river has a length of 80 km, passing through several districts namely The North Rantau, West Rantau, South Rantau, Pangkatan, Bilah Hilir, Panai Hulu, Panai Hilir (Labuhanbatu Regency BPS Statistic, 2019).

METHOD

Time and Research Site

The study was conducted in March, April and May 2020. The research site was conducted in Bilah river Labuhanbatu Regency. The research station is divided into 9 research stations, research stations based on government administration or sub-districts consisting of South Rantau sub-district, Pangkatan and Bilah Barat. Station 1 (2º 6'11.88" N, 99º 49' 56.88" E), Station 2 (2º 6' 10.56" N, 99º 50' 5.96" E), Station 3 (2º 6' 13.21" N, 99º 50' 14.37" E), Station 4 (2º 6' 35.86" N, 99º 51' 19.81 E), Station 5 (2º 7' 4.61" N, 99º 51' 50.89" E), Stasiun 6 (2º 7' 7.51" N, 99º 15' 26.75" E), Station 7 (2º 7' 56.94" N , 99º 57' 5.11" E), Station 8 (2º 8' 17.76" N, 99º 57' 44.79" E), and Station 9 (2º 8' 38.42" N, 99º 58' 4.87" E).

Data Collection

The technique in data collection in this study is Explore research. The data taken include such as coordinate points, temperature, water, water brightness, current speed, water pH performed insitu (on the research site) and tools used in this study include: GPS (Global Postioning System), Thermometer, pH meter, sechi disk, pimpong ball, Fishing line, stopwatch, and fishing rod (length 2 m). (But it can be adjusted to the state of the station), Kottelat (1993) as fish identification book, camera.

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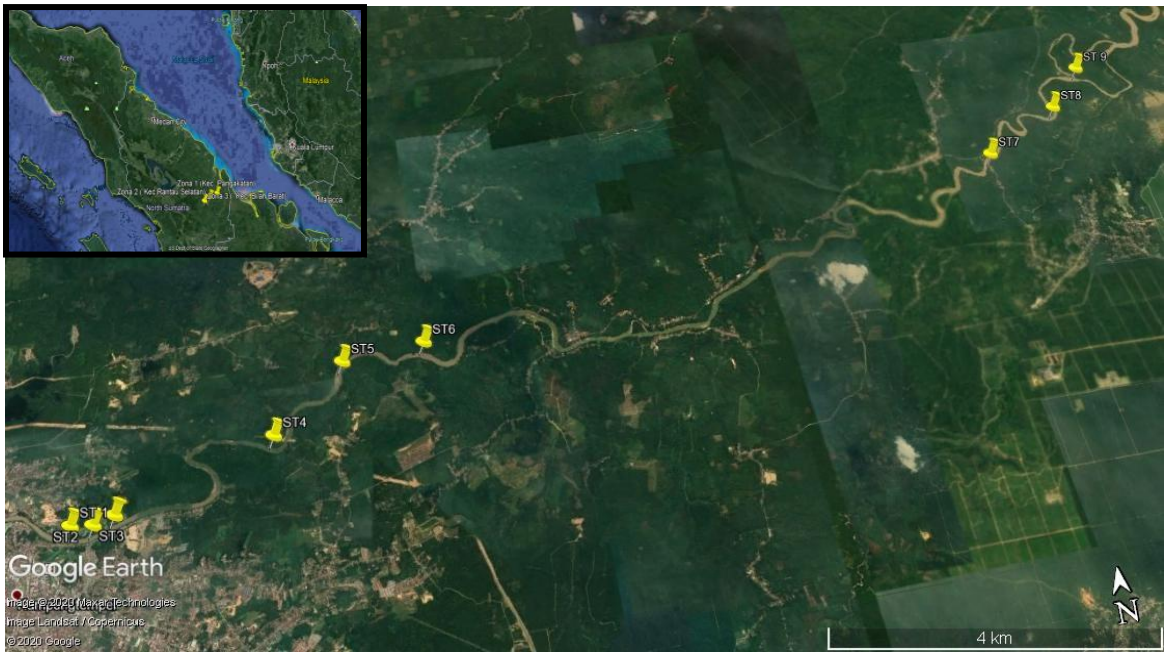

Figure 1. Map of the Research Station

Data Analysis

The results of the research data that have been analyzed include: Growth patterns using formulas (Khouw, 2009) and Population density using formulas (Khairul et al., 2019) and population density formulas also used according to (Kreb, 1999).

RESULTS AND DISCUSSION

Growth Patterns

Based on the graphic image of the growth pattern can be seen the length-weight of the *H. nemurus* namely value b = 3,136 then the value of b-3 *H. nemurus* growth pattern indicates the growth of fish weight is more dominant compared to the long growth called allometric positive. The Length-Weight relationships of *H. nemurus* have value isometric (b = 3) indicating an increase in their weight. And vice versa if b-3 (allometric) also shows the increase in the length of the fish is not balanced with the increase in weight. If weight gain is faster than long increase (b-3), then it is called positive allomemetric growth whereas when long increase is faster than weight gain (b < 3), eating growth is called allometric negative growth (Nasution & Dimenta, 2021); (Khairul et al., 2019); (Machrizal et al., 2019).

According to (Dwiponggo 1982; Harahap & Djamali 2012; Xi et al., 2017) The speed of this growth pattern can also be influenced by the genetic, physiological of fish, disease, and the main factors of catching and availability of food in the environment of *H. nemurus* live, because the speed of growth patterns in *H. nemurus* will differ from year to year, especially in young fish when the speed is relatively faster compared to the already large fish. This is due to the environmental conditions

that affect growth and there may still be many possible disturbances to asian redtail catfish in the river of large river streams and sand mines used by the community so that fish life can be disrupted.

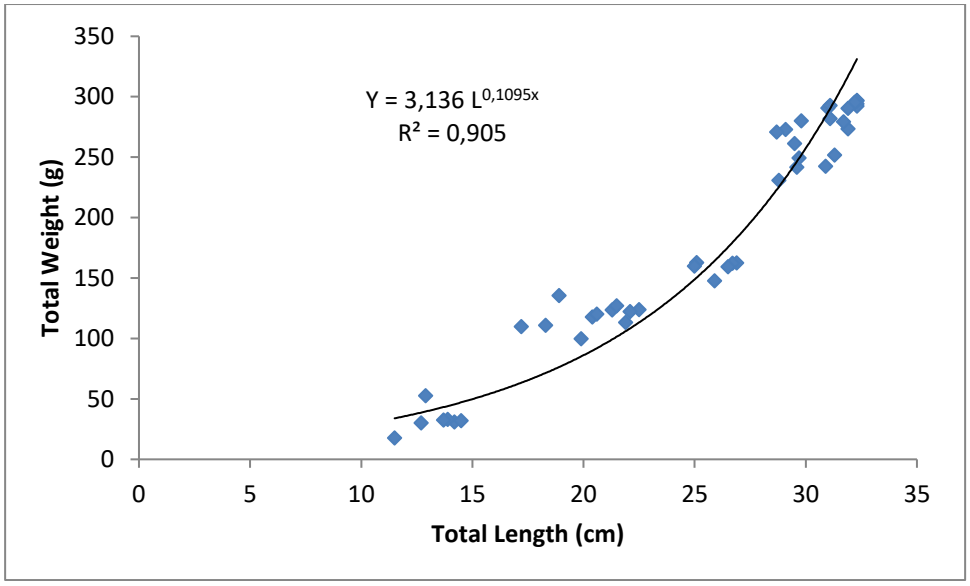

Figure 2. Length-Weight Relationships of *H. nemurus*

According to Susanto & farida (2017); Sugihartono et al., (2016); Effendi (2002) explaining about according to the concept that the growth will run slowly, then will run fast also then will run slowly until it reaches the length, then the growth runs constantly. This research was also conducted by Iksan & Irham (2009) in North Maluku watershed get different results i.e. growth patterns or length increase is not balanced with weight gain.

Population Density

The density of *H. nemurus* populations in the central Bilah River is obtained between 0.03-0.07 individuals /m². More data can be found following graphic on figure 3, The density of *H. nemurus* fish population is categorized as low, it is thought that the Bilah river waters have changed due to pollution due to garbage. This is in line with opinion (Heltonika et al., 2021; Kusmini et al., 2018; Nugroho et al., 2012). that the source of pollution in onshore waters, including rivers, is in the form of household and industrial waste. The pollution leads to worsening water quality and impacts the decline of fish populations in a waterway. In addition, according to Kusmini et al., (2019); Akbar (2012); Muflikhah et al., (2006) The highest human activities along the

river flow (watershed) such as settlements, transportation, agriculture, industry, power plants, and recreational locations can affect the structure of fish populations.

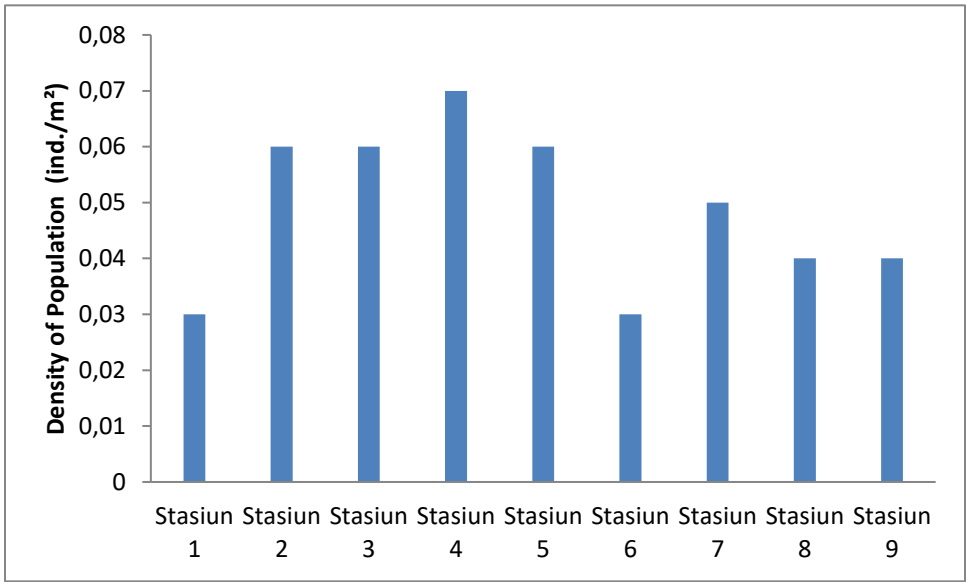

Figure 3. Population Density of *H. nemurus*

As for the low level of population density in the location of research in the Bilah river that is due to the high rate in fishing by the local population because *H. nemurus* is much in demand of the community, while the community uses infriendly fishing tools such as picking up fish using stun and because there are also communities making sand mining in the Bilah river then it will also affect the reduced population of *H. nemurus* due to the decrease in the density of *H. nemurus* population in the Bilah river. According to Heltonika & Karsih (2017); Roza et al., (2014); Saputra et al., (2019); Suin (1994). It is that a close relationship between *H. nemurus* population density and subtract levels exists, as this is related to population density and vice versa also the density of asian redtail catfish fish populations in the Bilah river from high, medium or to abundant.

CONCLUSION

The results of the research data can be concluded that The growth pattern of asian redtail catfish *H. nemurus* in Bilah river in all stations is categorized as low and asian redtail catfish population density is categorized as low, because male has more widely obtained than female fish. The amount of *H. nemurus* male obtained by 30 individual/m^2 while the amount of female obtained by 14 ind/m^2 in the pattern of growth and population density.

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