Population of Tambra Fish (*Tor tambra*) in Batang Gadis River Mandailing Natal North Sumatra

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Abstract. Tambra Fish (*Tor tambra*) is a commodity of freshwater fish with a high economic rate, therefore the community takes tambra fish continuously. The cultivation of tambra fish from Batang Gadis river Mandailing Natal has not been done, this research aims to find out the population of tambra fish and physical-chemical factors in Batang Gadis river. This type of research is descriptive. The location of the study was determined using purposive random sampling at every 4 (four) stations. The results showed that the population of *Tor tambra* in Batang Gadis river Mandailing Natal is classified as medium with the population structure is mostly the size of a small fish. The condition of the habitat of tambra fish in Batang Gadis river Mandailing Natal in general is still good enough for the life of tambra fish.

1. Introduction

Tambra Fish (*Tor tambra*) is a type of freshwater fish that has a high economic value, so that the community continuously makes arrests against this type of fish. tambra fish groups are the inhabitants of rivers in tropical forests, especially in mountainous areas. The native habitat of tambra fish is generally in the upstream part of the river in hilly areas with clear water and strong currents [1]. The distribution of tambray fish is in the regions of Sumatra, Java, Malaya, Burma, Thailand and Indochina [2]. Tor sp. is widespread in mountainous rivers throughout the Malay Peninsula and Indonesian islands including Sumatra, Kalimantan and Java [3]. Tambra fish populations in nature are rare, even feared to have come close to extinction. On the other hand, its exploitation continues to take place massively and there has been no cultivation activity. The basic data of this biology is also not widely known. According to Kottelat, Whitten, Kartikasari and Wirjoatmodjo [4] tambra fish are among the endangered species of fish due to deforestation and overfishing. The damage to the forest was caused by the felling of trees in the forest and on the banks of the river.

Batang Gadis River is included in Batang Gadis Watershed which is the largest watershed in Mandailing Natal area with an area of 369,963 ha or about 55.88% of the area of Mandailing Natal Regency. In Mandailing Natal area there are 6 (six) watersheds, namely: Batang Gadis watershed, Batang Batahan watershed, Batang Natal watershed, Batang Tabuyung watershed, Batang Bintuas watershed and Batang Toru watershed. The six watersheds are down to the West Coast, the Indonesian Ocean [5].

The results of the study Hidayati *et al.* [6] inform that the quality of Batang Gadis River water in accordance with government regulation number 82 of 2001 through the measurement of physical parameters of the water chemistry states that. Batang Gadis River has been polluted namely at station...
II i.e. tamiang village is lightly polluted while at stations III and IV (Tambang Bustak and Dalan Lidang) are moderately polluted while at station I (Simpang Banyak) is declared unpolluted.

Batang Gadis River as a living habitat of various organisms including fish whose existence began to decrease due to the presence of fishing activities and other activities in the area. This is in line with the cases that occur in Malaysia namely environmental degradation such as river pollution, forest damage and watershed erosion suspected of causing damage to the natural habitat of fish. Overfishing activity is also very influential in reducing the number of fish populations\(^7\)

Therefore, research needs to be done to find out The Population of tambra fish (\textit{Tor tambra}) and the chemical - physics factor of the waters in Batang Gadis River Mandailing Natal North Sumatra

2. Materials and Methods

This research was conducted in Batang Gadis River Gadis Mandailing Natal in Bula June-July 2020. The research method is descriptive exploration by conducting a survey first. Determination of sampling place using purposive sampling method at four specified stations. with an area of sampling area of 100 m\(^2\). Fishing techniques per unit area using scattered mesh fishing equipment and gill mesh. Sampling twice for gill net capture equipment is morning (06.00 wib), afternoon (18.00 wib), and for net capture tool sampling is done in the afternoon to night (17.00- 19.00 wib).

Fish caught are sorted, measured in length and body weight and calculated in number. Some caught fish are preserved in a 4\% formaldehyde solution. Water quality measured \textit{in that way} includes temperature, brightness, noise, depth, current speed, pH, DO, CO2. As for cod samples, BOD was taken to the laboratory for analysis using ice at a temperature of about 4\(^\circ\)C ahead of laboratory observations\(^8\). Population calculation uses the \textit{catch method per unit of effort}\(^9\).

3. Results and Discussion

In the study, tambray fish caught as many as 43 tails with a total length of between 9.2 cm - 39 cm and body weight between 18.2 grams - 700 grams. More fish caught range from 20- 28 cm to 22 (51.6\%). Female fish caught by 18 tails and 10 male fish and the remaining 15 are unknown (Table 1). From the results of the study in Table 1 can be seen the structure of the population of tambra fish in batang gadis river mandailing natal consists of puppies fish with a body length below 30 cm as much 36 fish, the size of a juvenile with a body length range of 31-40 cm as much as 6 fish and no found adult tambra fish with a body length above 51 cm. The number of puppies caught is higher than juvenile and adult fish. In this study, tambra fish were found only in the categories of puppies and adolescents. At the time of the research included into the rainy season so that the size of the teenagers until the inductees are thought to be many to the deeper part of the river. The caught tambra is about 39 cm long and weighs 700 g (Figure 1). The size of the fish caught is not maximum because according to interviews with the local people in around Batang Gadis River sometimes still caught tambra fish weighing 2 kg.

| Total Length Class | Number (tail) | Males | Gender |
|--------------------|--------------|-------|--------|
| I (1-10 cm)        | 10           | *     | *      |
| II (11-20 cm)      | 5            | *     | *      |
| III (21-30 cm)     | 22           | 9     | 13     |
| IV (31-40 cm)      | 6            | 1     | 5      |

Description: *: has not yet been identified by gender.
Density is one of the parameters of population observation that must be done. In this study, the density of tambra fish populations in Batang Gadis River different at each sampling location. Highest population density found at station I (Muarasipongi) (Table 2).

**Table 2.** Population Density of Tambra Fish in Batang Gadis River Mandailing Natal

| Station         | Amount | Density |
|-----------------|--------|---------|
| I (Muarasipongi)| 19     | 0,19    |
| II (Bustak Mine)| 12     | 0,12    |
| III (Muara Mais)| 5      | 0,05    |
| IV (Laru)       | 7      | 0,07    |
| Total           | 43     | 0,43    |
| Average Density |        | 0,1     |
The result of observation of the population density of tambra fish in batang gadis river is rare with the number of catches per unit of effort of 10 tails, where the other types of fish population density is quite high i.e. abundant (11-15 tails) (Table 3). The density of the tambra fish population at Station I is higher than the other three stations because the food source is more adequate than the rest of the zone. In addition to the feeding source in zone I also has a rock substrate and a heavy flow so that tambra fish are more found at the station because on the rocky subtrat more moss is found attached to the rock. This is in accordance with the opinion of Kiat (2004) in Haryono and Subagja \cite{1} that the group of tambra fish /mahseer is a river dweller in tropical forests especially in mountainous areas. The natural habitat of tambra fish is generally in the upstream part of the river in hilly areas with clear water and strong currents.

The density of tambray fish populations is influenced by the continued fishing by the population because this type of fish is the main target of their catch. This is due to the good taste of tambra fish meat and the high selling price in the market. Moreover, the development of logging, gold mining and community activities in batang gadis river has an effect on the reduced population of tambra fish, due to the decrease in the water quality of the river.. Atifah, et al \cite{10} reported that there was pesticide pollution in the river stems found in the water, soil sediments and fish of the organophosphate group (diazinon, malation, and chlorosyrifos) and from the organochlorine group (aldrin, dieldrin and endosulfan). In addition Atifah and Lubis \cite{11} also reported on the discovery of heavy metal pollution Hg, Cd, and Pb in the river trunk girl with content Hg < 0.0008, Cd < 0.003 and Pb <0,005. The value of this heavy metal level is still below the maximum limit. The pollution of heavy metals and pesticides will cause a decrease in the quality of the water and affect the biota that lives in the river, especially tambra fish.

| No | Specie                  | Population |
|----|-------------------------|------------|
| 1  | Mystacoleucus marginatus| Abundant   |
| 2  | Myrtus nemurus          | Medium     |
| 3  | Clarias batrachus       | Medium     |
| 4  | Cyprinus carpio         | Medium     |
| 5  | Puntius binotatus       | Abundant   |
| 6  | Rasbora argyrotaenia    | Abundant   |
| 7  | Nemacheilus fasciatus   | Abundant   |
| 8  | Barbymnus gonionotus    | Rarely     |
| 9  | Hyposarcs pardsalis     | Rarely     |

Description: population density, i.e. very rare: 1-2 tails, rarely: 3-5 tails, medium 6-10 tails, abundant: 11-15 tails, very abundant >15 tails.

The physical-chemistry quality of the water of the batang gadis river is still quite good as a place to live fish that is with an average temperature of 23.75 °C, pH 5.22, DO 5.50, BOD 2.77, depth 30-200 cm, current 0.05-0.1 m/sec (Table 4). According to Effendi \cite{12} the optimal temperature range for the life of organisms in tropical waters is 20°C - 30°C, and according to Cholik et al, \cite{13} Tor sp fish can only live in clear water that continues to flow rapidly with a relative temperature of 21-24°C. The habit of this fish is grouping and ringing or schooling.
Table 4. Physical and Chemical Factors of Batang Gadis River Mandailing Natal

| Physical-Chemical Parameters | Unit | Station | Average |
|------------------------------|------|---------|---------|
| Temperature                  | °C   | I       | II      | III     | IV      | 23.75   |
| pH                           |      | 6.2     | 5.7     | 4.5     | 4.5     | 5.22    |
| DO                           | mg/l | 6.2     | 5.1     | 5.5     | 5.2     | 5.50    |
| Bid                          | Mg/l | 2.0     | 2.7     | 3.4     | 3.0     | 2.77    |
| Depth                        | Cm   | 30-50   | 50-80   | 80-100  | 80-200  |         |
| Arus                         | m/s  | 0.1     | 0.07    | 0.09    | 0.05    | -       |
| Turbidity                    | NTU | 10.2    | 15.2    | 34.2    | 28.5    | 22.02   |

BOD values of each station in the waters of Batang Gadis River range from 2.0-3.5 mg/l. The lowest BOD value is at station I of 2.0 mg/l and the highest BOD is at station IV at 3.5 mg/l. The low bod value at station I is because this area is an area that is free of community activity or control areas so the amount of oxygen needed to decipher organic compounds is low.

The high value of BOD at station IV because this area is a dam area in which a lot of organic material content is dissolved load and is the estuary of many tributaries. Effendi [12] states BOD is an overview of organic material content which is the amount of oxygen needed by aerobic microbes to oxidize organic matter in water.

The lowest noise is at station I of 10.2 NTU, this is due to the low activity that occurs in this area. While the highest noise is at station III and station IV. Reduced area of forest area as well as the wider ground level of open watersheds cause surface erosion to become larger so that the sediment transport of surface flow sediments increases. The level of river raw water noise with the maximum standard of clean water is 25 NTU so that stations III and IV are already at a bad level.

The depth value of each research station in the waters of Batang Gadis River ranges from 30-200 m. The presence of fish in batang gadis river is heavily influenced by depth. For example, tambra fish when the condition of the river deepens, the more tambra fish are found, while at shallow depths it is very difficult to find.

The current speed of each river stream varies. This is due to the physical condition and different location of the river. Batang Gadis River has current speeds ranging from 0.05 – 0.1 m/sec. The speed of current on batang gadis river greatly affects the life of the fish that live on the river.

The observations in Table 3 show this corresponds to the results of tambra fishing found in location 1 where the location is upstream marked by clear water and the surrounding environment in the form of primary forest which is a viable location for the life and breeding of tambra fish.

4. Conclusion
The population of tambra fish in the trunk river is relatively moderate with the population structure largely the size of a child. The quality of the chemical physics of the water Batang Gadis river is still quite good as a place to live fish that is with an average temperature of 23.75 °C, pH 5.22, DO 5.50, BOD 2.77, depth 30-200 cm, current 0.05-0.1 m/second.

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