Composition Analysis of Bubu Catches in the Napangga River, Tanjung Medan District, Rokan Hilir Regency

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Abstract

This study aims to determine the types of main catches and bycatch and to identify the dominant types and sizes of fish caught. This research was conducted from January to February 2023 in the waters of the Napangga River, Tanjung Medan Village, Tanjung Medan District, Rokan Hilir Regency. The method used in this study was a survey method by directly observing the catch of bubu and then identifying the type of fish, the number of individuals, and the weight of the fish. The results showed that the main catches were two types of fish, namely Kissing gourami (*Helostoma temminckii*) totaling 30 individuals, and *Ompok hypophthalmus* totaling 24 individuals. Bycatch caught were 8 types of fish with a total of 47 individuals

1. Introduction

Rokan Hilir Regency has an area of 8,881.59 km^2 which has 18 sub-districts. One of the sub-districts in Rokan Hilir is Tanjung Medan which has a population of 74,638. The topography of the Tanah Putih sub-district is relatively flat and is located at an altitude of 40 meters above sea level and there are lots of peat swamps (BPS Kabupaten Rokan Hilir, 2020).

Bubu fishing gear is a type of trap fishing gear (Traps). Traps are environmentally friendly fishing gear used in fishing. Does not damage the environment, does not endanger fishermen, catches are of good quality, catches do not harm consumers, and is socially accepted by many people. According to Von Brandt (2005), traps are fishing gear that is operated permanently in a place in the form of a cage. The fish can enter easily without being forced but it is difficult to get out of the cage.

Fishing activities in the Tanjung Medan sub-district use a lot of fishing gear. So that more attention needs to be given to maintaining the sustainability of fisheries, especially trap fishing gear. Basic data such as the types of fish caught, percentage of catch and size of fish are needed in assessing the sustainability of capture fisheries.

This study aims to determine the types of main catches and bycatch and to identify the dominant types and sizes of fish caught. While the benefits of this research can be information about the species that are the catch of the main target and by-products of the trap fishing gear and are expected to become basic data in the study of the sustainability of the trap fishery.

2. Methodology

2.1. Time, Place and Materials

This research was conducted from January to February 2023 in the waters of the Napangga River, Tanjung Medan Village, Tanjung Medan District, Rokan Hilir Regency.

The materials used in this study were 5 units of trap fishing gear that had mouths and trap valves, tape measure to measure trap fishing gear, baskets or buckets to place catches, ruler to measure fish, boats for access to travel to the fishing area, digital cameras were used to obtain documentation during the research, a stopwatch and an aqua bottle to measure current speed, a weighted rope to measure the depth of the waters, a seccidisk to measure brightness, and a set of writing instruments.

2.2. Method

The method used in this study is a survey method where data collection is carried out by direct observation in the field with fishermen to follow the fishing process starting from setting traps, hauling gear, and calculating the number of main and by-catch catches.

2.3. Procedure

The steps taken in this study were to prepare traps starting from boats, baiting oil palm seeds, and net traps with a trap length of 150 cm, a trap height of 150 cm, a trap width of 120 cm, and a trap mouth width of 55 cm. In determining the fishing area is still based on fishermen's habits. Measure environmental parameters on the surface of the waters such as current speed, temperature, brightness and water depth. Setting trap fishing gear at the edge of the waters. Trap fishing gear is immersion for 2 days. Lifting traps (hauling) and counting the catch, the number of individuals (fish), and the number of types of fish caught.

2.4. Data Analysis

The data obtained, such as the number and type of catch, were analyzed descriptively and presented in tabular form. To find out the composition of the catch, all catches during the study were tabulated, and then analyzed using statistical analysis. This data analysis uses a simple formula, namely:

$$\text{Maincatch} = \frac{\Sigma \text{ Maincatch}}{\text{Total of cacth}} \times 100\%$$

$$\text{Bycatch} = \frac{\Sigma \text{ Bycatch}}{\text{Total of catch}}$$

3. Result and Discussion

3.1. General Condition

Dumai City is astronomically located between the waters of the Napangga River which are the research sites located in Tanjung Medan Village, Tanjung Medan District, Rokan Hilir Regency. According to stories from local residents around the 1980-1990s, these waters were the only place the local community depended on before they became acquainted with gardening. Being a fisherman was the most common profession at that time with abundant and profitable catches. With this fishery potential, the existing community chooses the profession of being a fisherman.

During the research, the fishermen caught fish in the morning and the collectors would wait for the fishermen to return from the fishing location to carry out fish buying and selling activities. The catch and the rest are for self-consumption by fishermen. After returning from fishing activities, usually most fishermen will do other work such as farming and some are raising livestock to get additional income.

3.2. Bubu Catch Tool

The traps used in this study were traps made of nets with polyethylene (PE) mesh material which functions as a material for the trap body, with a wooden frame which is tied using nylon rope and nails are used to form stretchers in such a way that they are rectangular in shape. Bubu is rectangular in shape, consisting of a trap mouth, injab, trap body, and an exit which is tied and invisible. The trap's mouth serves as a place for the fish to enter which is located at the front of the trap's body. The bubu's mouth is 55 cm wide and 150 cm high.

At the mouth of the trap there is an injep (funnel) in the form of a wall which functions to herd the fish in and it is difficult for it to get out of the trap. The rectangular body of the trap serves to confine the fish that enter the trap. Inside the body of the trap there is a place for bait using a net and tied above and below so that it hangs in the middle of the body of the trap. Inside the trap's body there is also a float in the form of 4-5 bottles which functions so that the trap's parts are not completely submerged into the water. The types of fish that dominate in public waters are relatively small groups of fish in rivers, swamps, and lakes. Mostly from the Cyprinidae family with the dominance of small-sized group fish, there is pressure in the aquatic environment (Asyari *et al.*, 2002).

3.3. Bait

The use of bait in fishing activities needs to pay attention to several other supporting factors, namely the use of bait as an effort to attract fish to approach the fishing gear. However, not all tools used by the community in their fishing activities use bait. Bait is a material used in fishing operations whose function is to attract fish (Sudirman & Mallawa, 2004). The bait used is palm fruit (*Elaesis guineensis*). The amount of bait used in one trap is 20 pieces of palm fruit. This bait

is wrapped using a net and tied above and below so that its position is in the middle of the trap body.

According to Harsandi (2015) palm seed bait has a less pungent odor, but this bait has a weakness, namely the whole oil seed bait is protected by fiber so the aroma that comes out the process runs slowly. The advantage of palm seed bait is that the bait does not run out quickly because the components of the palm seed have a material that is a little hard and not too soft; this can be seen when lifting the fishing gear that all the bait eaten by the fish does not run out. In this case the sense of smell becomes a more important factor for fish in murky waters in reaching for the bait, while the sense of sight is only an auxiliary tool in finding the bait.

According to the test results conducted by the Bogor Agricultural Institute (IPB) on the composition of the nutritional content of oil palm fruit, it was found that the protein content ranges from 15-18%; contains about 10% content of essential amino acids; fat content of 9.5%; crude fiber 25.19%; and the Ca:P ratio is 1:2.4.

3.4. Bubu Operation Technique

The technique of operating the trap fishing gear in Tanjung Medan village consists of several stages, namely the preparation stage, bringing supplies such as food, drinks, and diesel fuel, then heading to the fishing ground, carrying out the setup, namely by tying the main rope to the reed stalks. Located on the water's edge, then hauling, namely by lifting the catch, then counting the number of catches. The capture of bubu is carried out once every 2 days.

During the process of operating and lifting traps, only 1 fisherman did it. The sequence of trap fishing activities consists of preparation, lying of bait, setting traps to the fishing area and lifting traps (hauling) gear. The distance from the fishing base to the fishing ground is ± 2 km towards the headwaters with a length of time taken by boat, which is ± 15 minutes. The consideration for determining the fishing point is from the fishermen's habits, each fisherman has their own location for installing their traps. Fishermen will choose fishing areas that are far from residential areas so as not to be disturbed by human activities such as bathing and washing clothes. Bubu is installed with the mouth facing downstream against the current. Bubu is placed in different locations.

After installing the fishing gear in the fishing area, the traps will be left or soaked in the water for about 2 days, and then the fishermen will take the catch they get and also check the bait that is still there or is no longer suitable for use and replaced for re-installing the fishing gear.

3.5. Catch Composition

Based on observations of catches during the study, 10 fish species were caught with seven repetitions of catching. The number of fish caught can be seen in Table 1

Table 1. Composition of the Number of Fish Caught (head)

No	Fish Name	Arrest Day							Amount
		1	2	3	4	5	6	7	
1	Kissing gourami	3	3	6	5	4	4	5	30
2	*Ompok hypophthalmus*	4	2	2	4	4	3	5	24
3	Asian Redtail Catfish	-	-	1	-	1	-	1	3
4	Snakeskin gourami	2	-	2	2	2	1	3	12
5	Giant featherback	-	-	-	1	-	-	-	1
6	*Osteochilus melanopleuora*	1	2	1	2	-	1	-	7
7	Hampala barb	2	-	2	3	1	-	2	10
8	Indonesian leaffish	1	2	3	1	1	-	2	10
9	*Channa lucius*	-	1	-	-	-	2	-	3
10	Striped catfish	-	-	-	-	-	1	-	1
	Total								101

3.6. Composition Based on Fish Type

There were 10 types of fish caught during the study, namely kissing gourami, *Ompok hypophthalmus*, Asian Redtail Catfish, Snakeskin gourami, giant featherback, *Osteochilus melanopleuora*, Hampala barb, Indonesian leaffish, *Channa Lucius*, and striped catfish (Table 2).

The average number of fish species caught during the study was 6,143. The highest number of fish species caught occurred in trips 3 and 4, namely 7 species and the few fish species caught occurred in trip 2, 5 species (Table 3).

Table 2. Types of Fish Caught

No	Fish Type	Latin name
1	kissing gourami	*Helostoma temminckii*
2	*Ompok hypophthalmus*	*Ompok hypophthalmus*
3	Asian Redtail Catfish	*Mystus nemurus*
4	Snakeskin gourami	*Trichogaster pectoralis*
5	Giant featherback	*Chitala lopis*
6	*Osteochilus melanopleuora*	*Osteochilus melanopleuora*
7	Hampala barb	*Hampala macrolepidota*
8	Indonesian leaffish	*Pristolepis grootii*
9	*Channa lucius*	*Channa Lucius*
10	Striped catfish	*Pangasius Pangasius*

Table 3. Composition of Fish Species

Arrest Day	Date and time	Number of Fish Types
1	Wednesday/February 1st	6 types
2	Friday/3 February	5 types
3	Sunday/February 5th	7 types
4	Tuesday/7th February	7 types
5	Thursday/9th February	6 types
6	Saturday/February 11th	6 types
7	Monday/February 13th	6 types
Average		6,143

3.7. Composition based on Fish Weight

The number of fish caught during the study was 38.98 kg with an average of 5.569 kg. The highest number of catches occurred on trip 3 with a total of 6.6 kg. The least weight of the catch occurred in trip 1 with a total of 4.55 kg. The data can be seen in the Table 4.

Table 4. Fish Weight Composition

Arrest Day	Weight (Kg)	Percentage (%)
1	4.55	11.67
2	4.58	11.75
3	6,6	16.93
4	6,3	16,16
5	5,1	13.08
6	6,3	16,16
7	5.55	14,29
Total	38.98	100
Average	5,569	

3.8. Composition Based on Individual Fish

The number of fish caught during the study was 101 fish with an average of 14,429. The highest number of individual fish caught occurred in trips 4 and 7 totaling 18 individuals. The least number of individual fish caught occurred in trip 2, totaling 10 fish. For more details, see (Table 5).

During this study, 30 tambakan fish were caught, 24 kissing gourami, 12 snakeskin gourami, 1 giant featherback, 7 *O.melanopleura*, 10 hampala, 10 indonesian leaffish 3 *C. lusius*, 1 striped catfish, and three Asian redtail catfish. Based on the number of individual fish caught during the study, it is known that the highest catches by trap fishing gear are pond fish with a catch percentage of

29.7% and the least catches are giant featherback 1% and catfish 1%.

Table 5. Composition of individual fish

Arrest Day	Individual (fish)	Percentage %
1	13	12.87
2	10	9,9
3	17	16.83
4	18	17,82
5	13	12.87
6	12	11.88
7	18	17,82
Total	101	100
Average	14,429	

3.9. Catch Composition Based on Main Catch and By-catch

The main catch for this fishing gear is kissing gourami and Ompok. While the by catch is the other fish caught. Kissing gourami fish are native Indonesian fish which are found in several rivers in Sumatra and Kalimantan. Such as the regions of Nanggroe Aceh Darussalam, North Sumatra, West Sumatra, Riau, West Kalimantan, Central Kalimantan, South Kalimantan and East Kalimantan. These fish live in rivers, tributaries and puddles in the upstream and downstream areas, even at the mouths of rivers which are hilly and forested on the sides. This fish has high economic value, has prospects for developing aquaculture with great opportunities, the selling price is quite expensive, is an important commodity in the freshwater fish business but this fish is still rarely cultivated to date (Alem, 2016).

Table 6. Main Catch and Bycatch Catch Results

Composition	Fish Type	Latin name
Main catch	Kissing gourami	*Helostoma temminckii*
	Ompok	*Ompok hypophthalmus*
Bycatch	Asian Redtail Catfish	*Mystus nemurus*
	Snakeskin gourami	*Trichogaster pectoralis*
	Giant featherback	*Chitala lopis*
	O.melanopleuora	*Osteochilus melanopleuora*
	Hampala barb	*Hampala macrolepidota*
	Indonesian leaffish	*Pristolepis grootii*
	Channa lucius	*Channa Lucius*
	Striped catfish	*Pangasius Pangasius*

The growth of pond fish populations in nature is highly dependent on reproductive strategies and responses to environmental changes. During the rainy season (floods), these fish generally enter inland waters to swamp areas for spawning. Fishing in public waters tends to be out of control, because the catch is a priority for fishermen. Not infrequently fish that are mature and ready to spawn are also caught and some people use the eggs of this kissing gourami in traditional ceremonies. This is why the monk fish eggs are expensive; the price reaches IDR 250.000/kg (Ubamnata *et al*. 2015). This can lead to a decrease in population growth. It is feared that in the future the existence of certain types of fish will be threatened, such as in the form of extinction or genetic decline.

The main catch, results obtained were 30 kissing gourami and 24 ompok. So the main catch (HTU) in this study was 53.465%. While the by-catch obtained from 8 types of fish, a total of 47 individuals. So the by-catch in this study is 46.535%. So it can be concluded that the main catch and by-catch in this study are close to equal.

4. C**onclusion**

The number of fish that were mostly caught was kissing gourami (*Helostoma temminckii*) totaling 30 fish and *O.hypophthalmus* totaling 24 fish. The fewest

fish caught were Giant featherback (*C.lopis*) totaling 1 fish and striped catfish totaling 1 fish. Main catch the fishing gear for traps during this study were Kissing gourami with a total of 30 fish caught and Ompok with a total of 24 fish caught. The bycatch found during the study were three Asian Redtail Catfish (*Mystus nemurus*), 12 Snakeskin gourami (*Trichogaster pectoralis*), 1 Giant featherback (*Chitala lopis*), 7 *O.melanopleuora*, Hampala (*Hampala macrolepidota*) totaled 10 individuals, Indonesian leaffish (*Pristolepis grootii)* totaled 10 individuals, *Channa lucius* totaled 3 individuals, and striped catfish (*Pangasius pangasius*) totaled 1 individual. Therefore, many types of fish are caught, namely 10 types of fish.

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