

Differences in Eel (*Monopeterus albus*) Catch Results Using Fishing Gear Traps with Different Baits in Lopak Alai Village, Kumpeh Ulu District

Dhea Alfebrianti¹, Afriani H², Rizky Janatul Magwa^{1*}, Bagus Pramunsintha², Bs Monica Arfiana¹, Ainun Rohmawati Bareta¹

¹Department of Fisheries, University of Jambi, Indonesia

²Department of Animal Husbandry, University of Jambi, Indonesia
Jambi-Muara Bulian Road KM. 15, Mendalo Indah, Jambi Luar Kota District,
Muaro Jambi Regency, Jambi

Correspondence:

rizkymagwa@unja.ac.id

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ABSTRACT

Eel (*Monopeterus albus*) is one of the freshwater fishery products that has high economic value which is widely caught in Lopak Alai Village, Kumpe Ulu District using bubu fishing gear. This study aims to determine the differences in eel catches using bubu fishing gear with different baits in Lopak Alai Village, Kumpe Ulu District. This research was conducted in Lopak Alai Village, Kumpeh Ulu District on January 12th - February 07th, 2025. The research method used was the experimental method. The total of bubu used in this study was 60 bubu with each placement of 5 meters, the size of the bubu used was 100 cm which consisted of 2 treatments, namely using earthworm bait and golden snail bait weighing 10 grams, each bait was placed into 30 bubu with 20 repetitions. The results of the study showed that the total of eel catches (*Monopeterus albus*) with earthworm bait was 123 with an average weight of 611 g and an average length of 45 cm, while with golden snail bait it was 204 with an average weight of 1,393 g and an average length of 49 cm. The results of the t-test analysis showed that there were differences in the catches of eels with earthworm and golden snail bait.

INTRODUCTION

Lopak Alai Village, Kumpeh Ulu District, which utilizes the potential of swamp waters to carry out eel catching activities. Swamp waters are a natural habitat that supports the survival of various species including eels. Eels are one of the catches in Lopak Alai Village, Kumpeh Ulu District. Eels (*Monopeterus albus*) are one of the freshwater fishery products that have high economic value (Nuryadin *et al.*, 2020). Eels contain animal protein which is highly recommended for consumption by all ages, eels also have a distinctive taste and delicious texture when used as food or snacks. As carnivorous animals, eels usually eat small creatures such as: worms, golden snails and baby fish. The community in Lopak Alai Village usually catches eels not only for consumption but also for sale, eels can be caught using traditional fishing gear such as fishing rods and traps.

The fishing gear that is usually used by fishermen to catch eels in Lopak Alai Village, Kumpeh Ulu District is a bubu. Bubu is known among fishermen because it is environmentally friendly and the catch is still alive (fresh), in general, bubu fishing gear is used to catch types of fish that are economically important (Nugroho & Mulyono, 2017). Bubu (trap) is tool catcher fish which installed permanently in the water with time period which has determined with the aim of make it easier fish enter and to complicate fish go out (Bakari *et al.*, 2018). Tool catch trap is tool catch which nature passive because method its operation installed then abandoned and then the next day the day new lifted. Tool catch trap can made from materials such as wicker bamboo (bamboo netting), wicker rattan (rattan netting), wicker wire (wire netting, and plastic netting (Sumaryam, 2018). The shapes vary, some are shaped like: cylinders, half circle, four rectangle long, triangle elongated, and so on, in its operation there is use bait or without bait.

Bait is a type of stimulus that has chemical and physical properties and can provide a response to the organism concerned during the fishing process. Bait functions as a lure so that fish or other animals around the trap are attracted and caught into the trap. The bait used is bait that can stimulate fish or other animals that can utilize the sense of smell when looking for food (Susanto *et al.*, 2014). The use of bait in the process of catching fish with traps is very common among people or fishermen (Hidayatullah, 2019). In using bait, it is better to provide a fragrant and pungent aroma so that it stimulates eels to enter the trap. Bait is very effective in catching fish on fishing gear. In addition, bait is also a determining factor in the success of fishing (Sormin *et al.*, 2024).

Fishermen in Lopak Alai Village, Kumpe Ulu District usually use fishy-smelling earthworm bait to attract eels into the trap. Because the land is dry, fishermen have difficulty finding earthworms used as bait when catching eels. If earthworms are found in small numbers, they cannot support one fishing operation, because fishermen set traps in large numbers every day so that some of the traps installed do not use bait, therefore it will have an impact on the catch obtained by fishermen.

According to Saisar *et al.* (2019), earthworm bait is an effective bait for catching freshwater fish. As their natural home, earthworms often live in moist soil that is rich in organic compounds and natural minerals from human waste. In addition worm land, snail too can used as alternative bait for fisherman if worm land difficult for obtained. Snail can made into bait for catch eel because snail own aroma the strong one so that can interesting attention eel and trigger it for trapped. Snail can with easy found because in Lopak Alai Village, Kumpeh Ulu District, there are many fish farming ponds which are the habitat of golden snails. Based on description on need done observation and study with title "Differences in eel (*Monopterus albus*) catches using traps with different baits in Lopak Alai Village, Kumpe Ulu District".

METHODS

Place and Time

Research on differences in eel (*Monopterus albus*) catches using traps with different baits in Lopak Alai Village, Kumpe Ulu District. This activity was carried out from January 12 to February 7, 2025.

Materials and Equipment

The materials used during this study were the catch of eels (*Monopterus albus*) using a trap with different baits, namely earthworms and golden snails. The equipment used in this

study was a trap to catch eels, a camera to take pictures, a scale with an accuracy of 1 gram to measure the weight of the eel, a meter to measure the length, a laptop, stationery to record the catch of eels and a red rapia rope to mark the trap with earthworm bait.

Research Methods

The method used in this research is the experimental method., namely conducting direct fishing operations with local fishermen using bubu fishing gear. Sugiyono (2011) also stated that the experimental method is a research method used to determine the effect of a specific treatment on another variable under controlled conditions. A total of 60 bubu traps were used in this study, each placed at 5-meter intervals. The traps measured 100 cm in length. Two treatments were applied: 30 traps baited with earthworms (marked with red raffia rope), and 30 traps baited with golden snails. Each treatment was repeated 20 times. One capture was conducted per day, starting at 08.00 AM and retrieved the following day at the same time (24-hour setting). This experimental setup refers to the field design used by Aji *et al.* (2020), who applied a similar method involving 60 dome-shaped bubu traps and multiple bait types to assess catch composition under 24-hour soak times. The bait used for each bubu was cut into pieces with each weighing 10 grams and for the earthworm bait, a little soil was added so that the worms could not move out of the bubu while the golden snails were not given any additional soil.

Data Analysis

The catch data of the total, length, and weight of the catch are tabulated in the form of a table. To see the difference in catch results with different baits, the analysis uses a t-test analysis with the help of the Microsoft Excel application. According to Supadi (2000), to compare or distinguish two types of treatments is generally done using a t-test. This study was conducted by comparing the differences in eel catch results using 2 treatments, namely with earthworm bait and golden snail bait.

T-test

The T-test analysis is calculated using the following formula (Sudjana, 2005):

$$S_1^2 = \frac{n (\sum x_1^2 - (\sum x_1)^2)}{n - (n - 1)}$$

$$S_2^2 = \frac{n (\sum x_2^2 - (\sum x_2)^2)}{n - (n - 1)}$$

$$S_2^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

$$T \text{ hit} = \frac{\bar{X}_1 - \bar{X}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where:

X1 = average catch on earthworm bait (tail)

X2 = average catch on golden snail bait (tail)

n1 = total of samples in earthworm bait

n2 = total of samples in the golden snail bait

n = result of n1+n2

S = standard deviation

S₁² = Earthworm bait sample room

S_2^2 = Golden snail bait sample room

According to Gurusinga & Sibarani (2011), the formula for finding the standard deviation is as follows:

$$S = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

Where:

S = Standard deviation

x_i = Value of x -i

\bar{x} = Average

n = Total of samples

RESULTS

Research Location

The Research Location in Lopak Alai Village Kumpeh Ulu District can be seen in Figure 1.

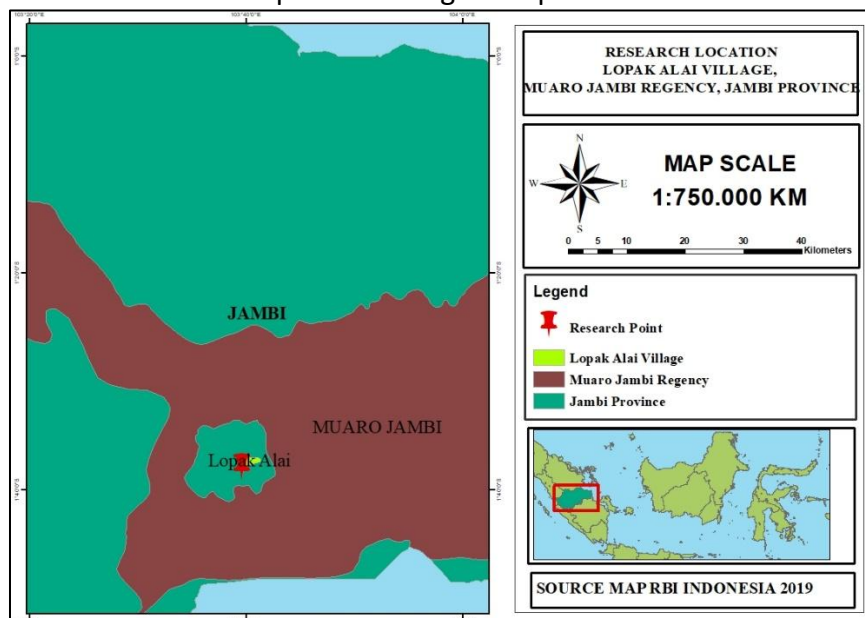
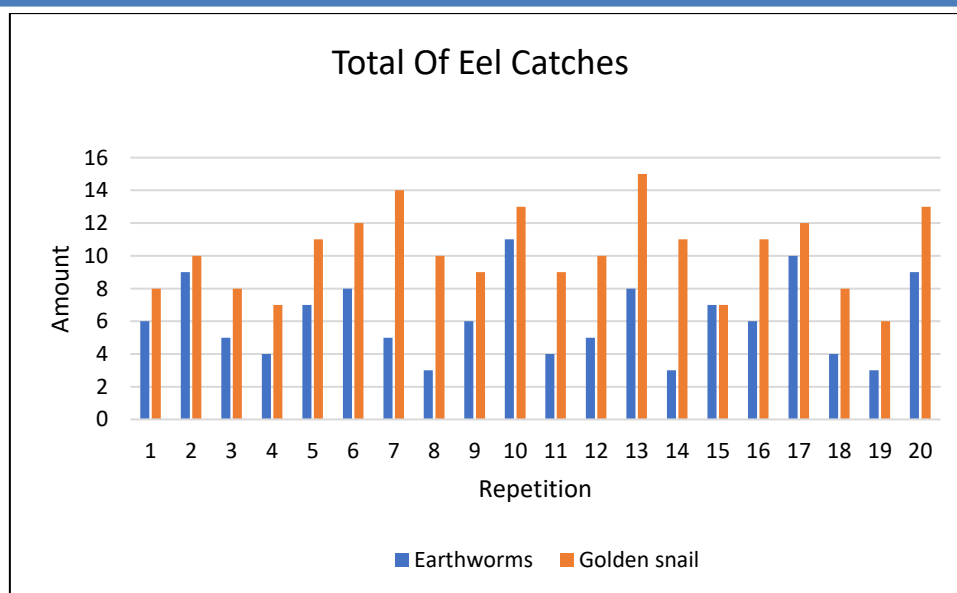


Figure 1. Map of Research Location in Lopak Alai Village Kumpeh Ulu District

Total of Eel Catches

Bubu is a fishing tool used by local fishermen to obtain eel catches. The total of eel catches in Lopak Alai Village, Kumpeh Ulu District can be seen in Figure 2.

Figure 2. Total of Eel Catches (*Monopterus albus*)

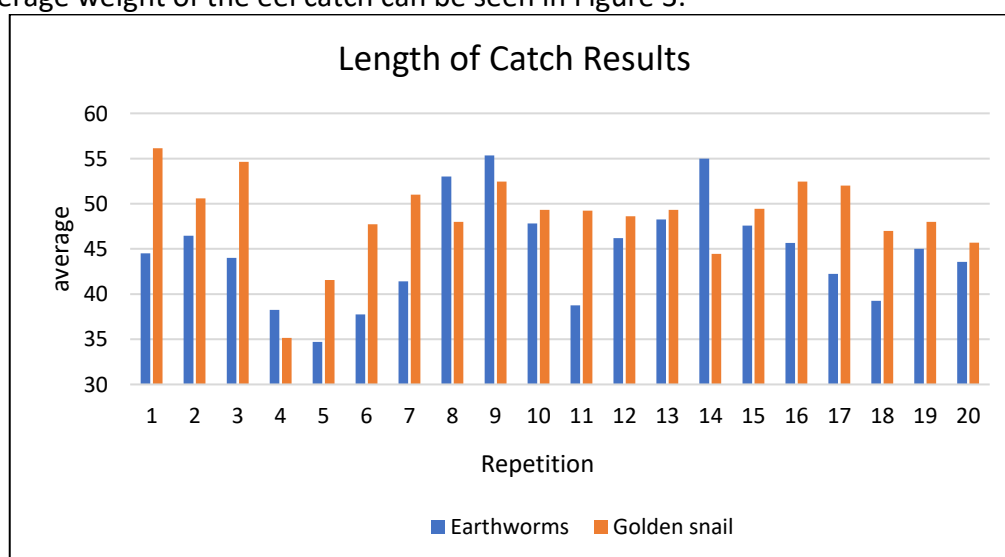
Complete data on the total of eel catches using trap fishing gear with different baits in Lopak Alai Village, Kumpeh Ulu District can be seen in Table 1.

Table 1. Total of Eel Catches Using Fishing Traps With Different Baits

Difference in bait	Total of catches (tails)	Average catch (fish/day)	T hit	T table	Stdev
Earthworms	123	6	7.78096	2.09302	2.41214
Golden snail	204	10			2.483631

Length of Catch Results

The length of the catch is the length of the fish species or types of marine or freshwater animals caught when operating the bubu fishing gear which is then measured using a meter. The average weight of the eel catch can be seen in Figure 3.

Figure 3. Average Length of Eels (*Monopterus albus*)

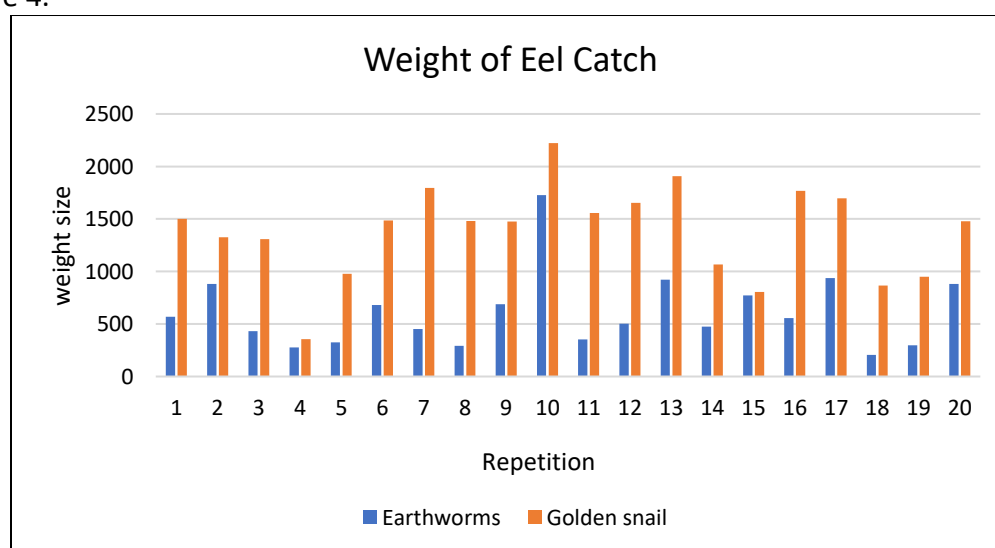
Complete data on the length of eel catches using trap fishing gear with different baits in Lopak Alai Village, Kumpeh Uluh District can be seen in Table 2.

Table 2. Length of Catch Results Using Fishing Gear with Different Baits

Difference in bait	Average length of catch (cm/day)	T hit	T table	St. dev
Earthworms	45	8.83054	2.09302	109.22
Golden snail	49			120.13

Weight of Eel Catch

The weight of the catch is the weight of the fish species or types of marine and freshwater animals caught when operating the bubu fishing gear which will be weighed using a digital scale with an accuracy of 1 gram per tail. The total weight of the eel catch can be seen in Figure 4.

Figure 4. Total Weight of Eel Catch (*Monopterus albus*)

Complete data on the weight of eel catches using trap fishing gear with different baits in Lopak Alai Village, Kumpeh Uluh District can be seen in Table 3.

Table 3. Weight of Eel Catch Using Bubu Fishing Gear with Different Baits

Difference in bait	Total weight of catch (grams)	Average weight of catch (gr/day)	T hit	T table	Stdev
Earthworms	12.323	611	9.67368	2.09302	351.68
Golden snail	27.865	1.393			439.44

DISCUSSION

Research Location

Lopak Alai Village, Kumpeh Ulu District is one of the areas in Jambi Province where the majority of the population is farming. Muara Jambi Regency consists of 11 sub-districts, one of which is Kumpe Ulu District which consists of 18 villages (Central Statistics Agency of Muaro Jambi Regency, 2023). Kumpeh Ulu District is a sub-district in Muara Jambi Regency which is known as one of the areas that has great potential in agricultural and fisheries activities. This can be seen from the majority of people in the Kumpe Ulu District, some of whom work as farmers and some also work as fishermen.

The potential of fishery resources in the Lopak Alai Village area, Kumpeh Ulu District itself is by utilizing swamp waters to carry out fishing or eel catching activities (Agricultural Training Agency, 2021), the swamp waters in Lopak Alai Village are irrigation because they are on the banks of the Kumpeh River, which is a branch of the Batang Hari River which is the largest river in Jambi Province that divides the city of Jambi. Other potentials in Lopak Alai Village, Kumpeh Ulu District, which are quite large, namely there are patin fish cultivation ponds and are managed as large enough cultivation areas to be developed and managed as residential areas, industrial areas, (Muaro Jambi Regency Fisheries and Livestock Service, 2020), and management of fishery products in the Lopak Alai Village area, Kumpeh Ulu District properly as one of the supporters of economic activities in the area.

Fishermen in Lopak Alai Village use traps as a fishing tool and the catch is eels. Eels are a catch that has high economic value, so fishermen often adjust the price based on the area if they are to be sold to collectors, that is, the price of eels will be higher if they are brought to areas that are not close to areas where it is difficult to find eels, while in areas close to fishermen they will adjust the normal price to other fishermen.

Total of Eel Catches

From Figure 2, the total of eel catches that are greater are found in the golden snail bait compared to the total of eel catches using earthworm bait. In the earthworm bait, the largest total of catches is 11 which is found in the 10th repetition and for the smallest total of catches with the total of catches 3 which is found in the 8th, 14th and 19th repetitions. While in the golden snail bait, the largest total of catches is 15 which is found in the 13th repetition and for the smallest total of catches with the total of catches 3 which is found in the 19th repetition. This can be influenced by the golden snail bait which has a strong fishy smell so that it can attract the attention of eels and for the catch that is caught more is the golden snail bait. This is supported by the statement of Alditia *et al.* (2014), this can happen because the fishing gear that uses golden snail bait can provide a fresh aroma to fish or eels so that the eels are attracted and come closer and then enter the trap fishing gear. The results of this research are in line with Purnomo *et al.* (2024) who stated that strong-smelling bait can increase the response of target fish to trap fishing gear. In the research of Efraldo *et al.* (2014), the use of golden snail bait can be used as an alternative bait for fishermen to catch fish or eels because golden snails have a strong aroma so they can attract the attention of fish or eels, golden snails also have an effectiveness value of 63.15% of the total catch.

Based on table 1, the total of eel catches using traps with earthworm bait is 123 with an average of 6/day. While with golden snail bait as many as 204 with an average of 10/day, where the golden snail bait has a greater total of catches compared to earthworm bait. The results of the T-test analysis show that there are differences in catch results using trap fishing gear with different baits in Lopak Alai Village, Kumpeh Ulu District with a T hit value = 7.78096 which is greater than T tab = 2.09302, then it was decided to reject H₀ and accept H₁. Where the use of different types of bait there are differences in the results of eel catches (*Monopterus albus*). The success factor of fishing or eel catching, especially for passive fishing gear such as traps is largely determined by the right bait to attract the attention of eels into the trap. This is reinforced by Susanto *et al.* (2015), bait plays an important role in attracting the attention of eels because fish or eels have a sense of smell and sight that are usually used in looking for food, the presence of bait that can attract eels to enter the trap with movement, color, taste, and smell of bait.

Length of Catch Results

From Figure 3, the longest eel size was found in the 9th and 14th repetitions on earthworm bait with an average length of 55 cm and the lowest eel length was found in the 5th repetition with an average length of 35 cm. While the longest eel length on golden snail bait was found in the 1st repetition with an average length of 56 cm and the lowest length was found in the 4th repetition with an average length of 35 cm. The length of the catch with golden snail bait was longer with an overall average of 49, while the earthworm bait had an overall average of 45 cm. The average length of the eels caught was very large when compared to Halim (2018) study with an average length of eels caught of 30 cm. This shows that the catches of rice field eels and swamp eels have differences in the length of the catch which is influenced by their different habitats. This is reinforced by Sitompul (2017) who explained that eels (*Monopterus albus*) are a group of fish shaped like snakes that are included in the synbranchidae family. According to Iqbal (2011), swamp eels have a round, elongated body shape with a length of more than 50 cm.

Based on Table 2, the length of the catch of eels using golden snail bait is an average of 45 cm. While with golden snail bait, the average is 49 cm longer with golden snail bait compared to earthworm bait. The results of the T-test analysis show that the difference in eel catch results using trap fishing gear with different baits has a difference in the length of eel catch results in Lopak Alai Village, Kumpeh Ulu District with a T hit value = 8.83054 which is greater than T tab = 2.09302, then it was decided to reject H and accept H. The length and shortness of the fish or eels caught can be affected by different bait treatments. This is supported by the statement of Supriyadi *et al.* (2013), the high and low growth in length size is due to the bait treatment given having high absorption capacity. This is reinforced by Sunarno & Syamsunarno (2017) who added that fish growth is closely related to the availability of protein in feed and also the absorption capacity which will affect growth. According to Herawati *et al.* (2018), golden snails have a high protein content of 51%, while earthworms range from 64–76%. Worms are superior in protein content, but golden snails are still effective. In addition to protein content, aroma factors and fatty acid content can play a role in attraction, explaining why golden snails are effective despite their lower protein content.

Weight of Eel Catch

From figure 4, the heaviest eel weight was in the 10th repetition on earthworm bait weighing 1.727 grams and the lowest eel weight was in the 18th repetition weighing 205 grams. While the heaviest eel weight on golden snail bait was in the 10th repetition weighing 2.222 grams and the lowest weight was in the 4th repetition weighing 355 grams. The weight of the catch with golden snail bait was higher because the eels caught were larger than those with earthworm bait. This can be observed during the study when carrying out eel catching activities using golden snail bait, the bait was completely eaten by the eels. This is supported by the statement of Herawati *et al.* (2016) that the protein content of golden snail meat is 75.68% higher when compared to the protein of silk worms which is 66.26%. This is supported by Kordi (2011), the protein content of golden snail meat is 57.76% higher when compared to earthworm protein which is 45.7%. This is reinforced by Idawati *et al.* (2018) that golden snails as bait previously gave a positive growth response to fish.

Based on Table 3, the weight of the eel catches with earthworm bait produced 123 eels with a total weight of 12.232 grams with an average of 612 grams, while with golden snail bait it produced 204 eels with a total weight of 27.865 grams with an average of 1.393 grams, which is heavier with golden snail bait than with earthworm bait. The results of the T-test

analysis show that the difference in eel catches using trap fishing gear with different baits has a difference in the weight of the eel catch in Lopak Alai Village, Kumpeh Ulu District with a T-value of $t_{hit}=9.67368$ greater than $T_{tab}=2.09302$, then it was decided to reject H_0 and accept H_1 . This is because the high value of the weight of the eel catch in the trap with golden snail bait is due to the total of catches in the trap with golden snail bait being greater, so the total weight will be greater. This is in accordance with the opinion of Rahmad (2019) who stated that the greater the total of catches, the heavier the catch. Strengthened by the opinion of Insani *et al.* (2021), that the total weight of the catch obtained is directly proportional to the total of catches so that the total of catches affects the total weight of the catch.

CONCLUSION

This research shows that the use of different baits in the trap fishing gear significantly affects the catch of eels (*Monopterus albus*) in Lopak Alai Village, Kumpeh Ulu Regency. The use of golden snail bait resulted in a higher number of catches, length, and weight of eels compared to the use of earthworm bait. This is influenced by the strong aroma of golden snails which is more effective in attracting eels. Thus, golden snails can be recommended as a more effective alternative bait for eel fishing activities, especially when the availability of earthworms is limited.

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