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Inventory of Fish Captured in the Komering River Sukadarma Village Jejawi District Ogan Komering Ilir Regency

Inventaris Ikan Tertangkap di Perairan Sungai Komering Desa Sukadarma Kecamatan Jejawi Kabupaten Ogan Komering Ilir

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ABSTRACT

Information on fish species composition is essential for evaluating the ecological condition of river ecosystems and providing a scientific basis for sustainable fisheries management. However, data on fish diversity in the Komering River, particularly in Sukadarma Village, Jejawi District, Ogan Komering Ilir Regency, remain limited. Therefore, this study aimed to inventory fish species caught in the Komering River and assess their diversity, evenness, and dominance. The research was conducted from February to May 2024 at five observation stations using a purposive sampling approach. Fish sampling was carried out four times per month for three consecutive months. Data were analyzed using the Shannon–Wiener diversity index (H'), evenness index (E), and Simpson's dominance index (C). A total of 635 individual fish representing 21 species were recorded during the study. The diversity index ranged from 1.03 to 3.42, indicating moderate diversity at Stations 1–4 (H' = 1.03–2.78) and high diversity at Station 5 (H' = 3.42). Evenness values ranged from 0.51 to 0.98, indicating that fish individuals were generally distributed evenly among species. Dominance index values ranged from 0.18 to 0.62, with only Station 3 showing species dominance (C = 0.62), while the remaining stations exhibited no dominant species. These findings indicate that the Komering River in Sukadarma Village still supports relatively stable freshwater fish communities with moderate to high biodiversity, providing important baseline information for fisheries resource management and biodiversity conservation.

Keywords: *fish inventory, sukadarma village, fish diversity*

ABSTRAK

Informasi mengenai komposisi jenis ikan penting untuk mengevaluasi kondisi ekologis ekosistem sungai serta menjadi dasar ilmiah dalam pengelolaan perikanan yang berkelanjutan. Namun, data mengenai keanekaragaman ikan di Sungai Komering, khususnya di Desa Sukadarma, Kecamatan Jejawi, Kabupaten Ogan Komering Ilir, masih terbatas. Oleh karena itu, penelitian ini bertujuan untuk menginventarisasi jenis ikan yang tertangkap di Sungai Komering serta menganalisis tingkat keanekaragaman, kemerataan, dan dominansinya. Penelitian dilaksanakan pada bulan Februari hingga Mei 2024 di lima stasiun pengamatan dengan menggunakan metode *purposive sampling*. Pengambilan sampel ikan dilakukan sebanyak empat kali setiap bulan selama tiga bulan berturut-turut. Analisis data dilakukan menggunakan indeks keanekaragaman *Shannon–Wiener* (H'), indeks kemerataan (E), dan indeks *Dominansi Simpson* (C). Selama penelitian diperoleh 635 individu ikan yang terdiri atas 21 spesies. Nilai indeks keanekaragaman berkisar antara 1,03–3,42, yang menunjukkan kategori sedang pada Stasiun 1–4 (H' = 1,03–2,78) dan kategori tinggi pada Stasiun 5 (H' = 3,42). Nilai indeks kemerataan berkisar antara 0,51–0,98, yang menunjukkan bahwa individu ikan tersebar relatif merata pada setiap

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spesies. Nilai indeks dominansi berkisar antara 0,18–0,62, dengan hanya Stasiun 3 yang menunjukkan adanya spesies yang mendominasi (C = 0,62), sedangkan pada stasiun lainnya tidak ditemukan spesies yang dominan. Hasil penelitian menunjukkan bahwa Sungai Komering di Desa Sukadarma masih memiliki komunitas ikan air tawar yang relatif stabil dengan tingkat keanekaragaman sedang hingga tinggi. Temuan ini memberikan informasi dasar yang penting sebagai acuan dalam pengelolaan sumber daya perikanan dan upaya konservasi keanekaragaman hayati perairan.

Kata Kunci: inventarisasi ikan, desa sukadarma, keanekaragaman ikan

INTRODUCTION

Freshwater ecosystems are currently undergoing one of the most severe rates of biodiversity decline worldwide (Zieritz *et al*., 2024). Biodiversity plays a critical role in maintaining ecosystem balance and contributes significantly to resilience against climate change and environmental disturbances (Zhou *et al*., 2025). Information on fish species composition in riverine ecosystems provides an essential basis for understanding aquatic biodiversity and assessing the sustainability of fish stocks, which are directly linked to ecological stability. Environmental conditions strongly influence the behavior and growth of freshwater fish, particularly under conditions of elevated salinity (Leite *et al*., 2022) and rising water temperatures (Boltaña *et al*., 2017). Increasing human populations and growing demand for freshwater resources have resulted in substantial alterations to river ecosystems, including the construction of reservoirs that modify natural flow regimes, reductions in groundwater that contribute to channel desiccation, and nutrient pollution that degrades water quality (Santee *et al*., 2024). The diversity of riverine fish serves as an indicator of environmental quality and ecosystem stability. In the Mesuji River watershed, anthropogenic activities particularly during the dry season have been shown to contribute to significant water pollution (Rosid *et al*., 2025).

River ecosystems play a vital role in maintaining environmental balance and serve as an important source of fishery resources. The Komering River, particularly in Sukadarma Village, Jejawi District, Ogan Komering Ilir Regency, is one of the waters utilized by local communities for fishing activities. As one of the major rivers in South Sumatra Province, the Komering River flows into the Musi River and holds significant ecological and economic importance. Inventories of fish species can provide valuable insights into fisheries potential, while extensive research in various rivers offers baseline data for assessing the condition of aquatic ecosystems. (Helmizuryani *et al*., 2025) reported that fish diversity in the Bikang and Kurau Rivers of Bangka, identified using environmental DNA (eDNA) techniques, consisted of 3 species, while direct fishing methods yielded 18 species, with 1 species detected by both approaches. In the swamp waters of Kuro Village, Pampangan District, Ogan Komering Ilir Regency, 15 species were recorded during the dry season, representing 3 orders, 8 families, and 12 genera from a total of 159 individuals (Junaidi *et al*., 2021). (Budiman *et al*., 2021) found that the fish diversity index (H´) of the Batang Uleh River in Jambi was categorized as moderate, with 13 species recorded. Similarly, (Harmilia *et al*., 2024) reported a moderate fish diversity index in the Ogan River, Pemulutan District, Ogan Ilir, where 24 species from 14 families were identified. Research by (Muslim & Syaifudin, 2022) recorded 1,509 individuals from 17 families and 24 species in the Kelekar floodplain swamp, with moderate diversity. In addition, (Khoirunisyah *et al*., 2024) documented 1,398 individuals from 4 orders, 13 families, 25 genera, and 32 species in Teluk Benderas Lake, Riau. Beyond Indonesia, studies in three tropical Australian rivers demonstrated that water withdrawals during the dry season reduced banana shrimp yields by up to 53%, highlighting the importance of maintaining minimum flows for fisheries sustainability and water resource management (Broadley *et al*., 2020).

Research employing the Thomson and Bell length-based model reported that tilapia (*Oreochromis niloticus*) dominated the catch in Jatibarang Reservoir by 72%; however, its stock exhibited signs of decline despite routine restocking efforts (Triharyuni *et al*., 2023). A study conducted in the upper Yellow River using an integrated model assessed the impact of climate change on the habitat of *Gymnocypris eckloni* and revealed that increases in water discharge and temperature expanded suitable habitat areas, particularly during spawning and juvenile stages (Zhao *et al*., 2024). Catch data play a critical role in identifying protected areas, ensuring that riverine fish—as an important protein source for local communities—contribute to stabilizing fish production and maintaining biodiversity (Poissant *et al*., 2023). To date, data on fish species composition in the Komering River, particularly in the Sukadarma Village area, remain undocumented. Information on species composition and abundance is essential as a foundation for fisheries resource management. Such data are necessary to evaluate fish population status, detect environmental changes driven by human activities, and provide references for sustainable management and conservation of fish resources.

Therefore, the present study aims to inventory fish species caught in the Komering River at Sukadarma Village, Jejawi District, Ogan Komering Ilir Regency.

RESEARCH METHOD

Time and Place

This research was conducted from February to May 2024 in the Komering River, Sukadarma Village, Jejawi District, with five observation stations coded ST.

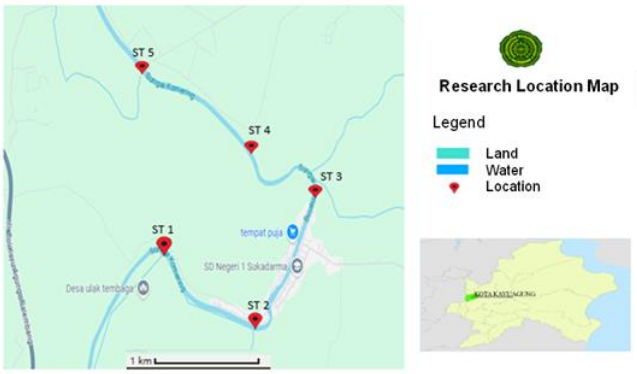

Figure 1. Research Location Map
Source: google maps dan krsumsel

Research methods

This research was conducted using a survey method by collecting fish samples from the Komering River in Sukadarma Village, Jejawi District, Ogan Komering Ilir Regency. Sampling was carried out four times per month over a three-month period.

Fish sampling employed a purposive sampling technique, in which observation stations were intentionally selected to represent the diversity of habitat characteristics along the Komering River. The descriptions of the five observation stations are as follows:

a. Station 1 (3°07'06.2"S; 104°50'25.5"E) was located at the confluence of a tributary near a plantation area, characterized by wetlands and influenced by agricultural activities.
b. Station 2 (3°07'36.5"S; 104°51'13.1"E) was situated in a densely populated area with strong interactions between human activities and the aquatic environment.
c. Station 3 (3°06'36.7"S; 104°51'46.5"E) was located at the confluence of tributaries surrounded by oil palm and rubber plantations.
d. Station 4 (3°06'20.1"S; 104°51'06.6"E) was situated near a swampy area characterized by dense aquatic vegetation and riparian trees along the riverbanks.
e. Station 5 (3°05'54.2"S; 104°50'14.6"E) was located at the confluence of the Ogan and Komering Rivers, characterized by relatively intact natural vegetation and high biodiversity.

Research Procedures

Fishing activities were conducted using fishing gear such as trawls and nets. Fish species were identified at the sampling sites based on morphological characteristics, including body shape, length, scale type, color pattern, mouth shape, fin shape, and tail shape. Water quality parameters were measured directly at each observation site, including pH (using a pH meter), temperature (using a thermometer), and water clarity (using a Secchi disk).

Statistical Analysis

1. Diversity

Diversity is calculated using the Shannon-Wiener calculation formula Odum (1993)

$$H' = \sum_i^S Pi\ In\ Pi$$

Description :
H': Diversity Index
Pi: The ratio of individuals of the i-th species to the total number of individuals
Ni: The number of individuals of the i-th species
N: The total number of individuals of the species
Diversity outcome criteria based on Krebs, 1989:
H'–<1 = low diversity
H' – 1 <H'≤ 3 = moderate diversity
H' –≥ 3 = high diversity

2. Evenness Index

Analysis of the evenness index of fish species using the formula Odum (1993) :

$$E = \frac{H'}{H'maks}$$

Description:
H': Shannon-Wiener Diversity Index
E: Evenness Index
H'max: Maximum Diversity Index
S: Number of species
If the value is:
(E) close to 0 (≤ 0.5) = the distribution of the number of individuals tends to be uneven; (E) close to 1 (> 0.5) = the distribution of the number of individuals tends to be even

3. Dominance Index

To determine dominance, the Simpson dominance index (1949) in Odum (1993) is used, with the following equation:

$$D = \sum (ni/N)^2$$

Description:
D: Dominance index
Ni: Number of individuals per species
N: Number of individuals of all species
Ranging index value:
If the C value is close to 0 (<0.5), then no species dominates. If the C value is close to 1 (>0.5), then there is a dominant species.

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RESULT AND DISCUSSION

RESULTS

a. Fish Caught

The results of the study obtained 21 types of fish caught, with a total number of fish caught of 635. The number of fish per station is St.1 as many as 165 fish from 9 types of fish, St.2 as many as 149 fish from 10 types of fish, St.3 as many as 65 fish from 4 types of fish, St.4 as many as 112 fish from 11 types of fish, and St.5 as many as 144 fish from 12 types of fish (Figure 2; Figure 3).

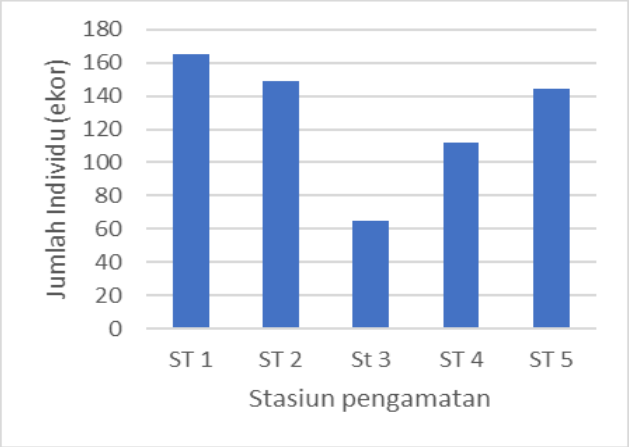

Figure 2. Number of Individual Fish at 5 stations

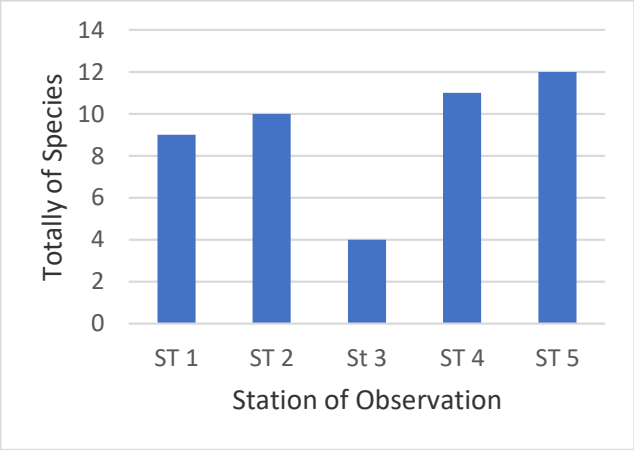

Figure 3. Number of types Fish at 5 stations

Figure 4 presents the total abundance of fish species recorded in the study area. The observed abundance varied substantially among species, with *Rasbora argyrotaenia* showing the highest number of individuals, while several species were represented by only a small number of individuals. These differences reflect the variation in species composition and relative abundance of the fish community.

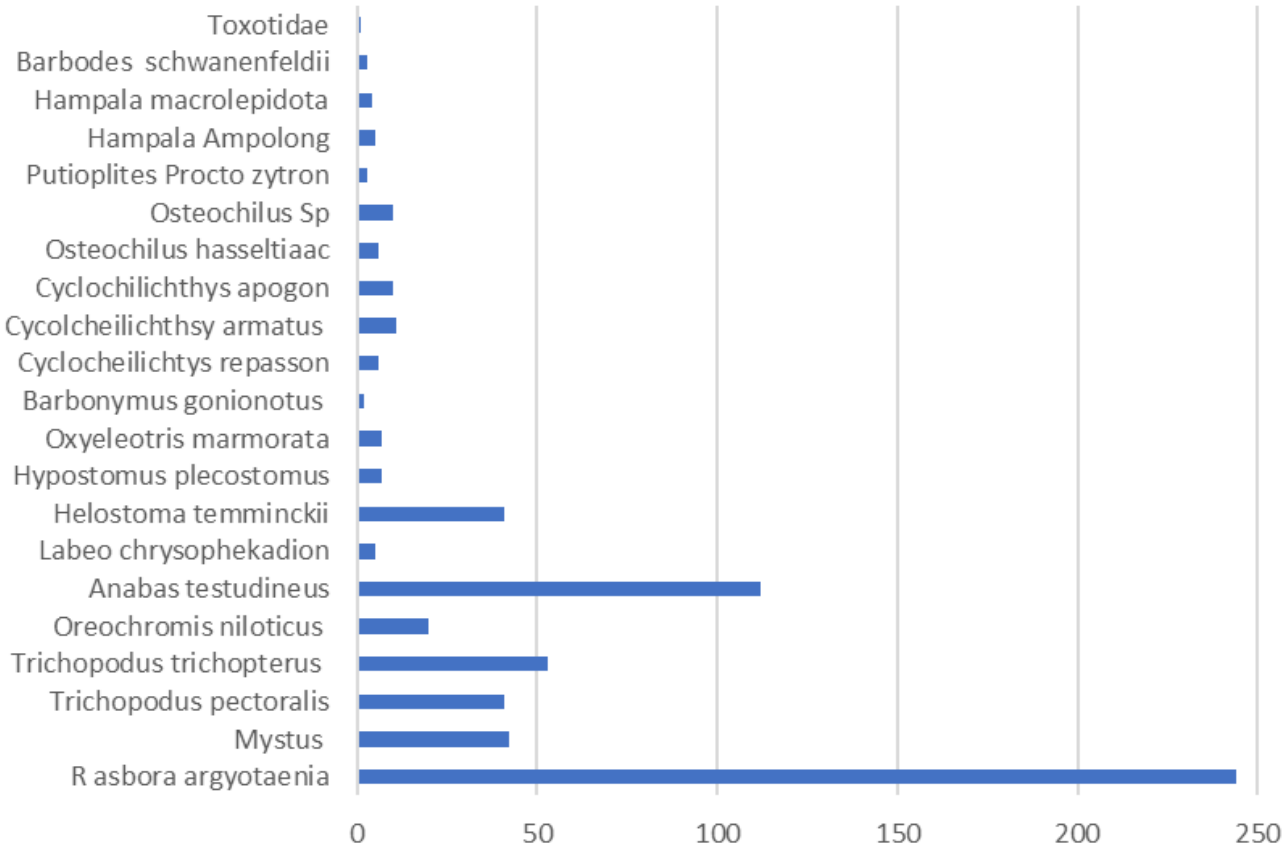

Figure 4. Types and total number of fish caught

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The results of the analysis for the Diversity Index (H'), Evenness (E), and Dominance (C) are presented in Table 1, and the water quality parameters are presented in Table 2. The fish species obtained from the catch are shown in Figure 5.

Table 1. Diversity Index (H'), Evenness (E), Dominance (C)

Station	**H'**	Diversity	**E(%)**	Evenness	**C**	Dominance
1	2.74	Medium	0.86	Evenly	0.18	No
2	2.46	Medium	0.74	Evenly	0.25	No
3	1.03	Medium	0.51	Evenly	0.62	Yes
4	2.78	Medium	0.80	Evenly	0.19	No
5	3.42	high	0.98	Evenly	0.32	No

Table 2. Water Quality Parameters

Parameter	station 1	station 2	station 3	station 4	station 5
pH	6.9	7.0	7.2	7.7	7.5
Temp (°C)	28.3	28.5	28.7	27.6	28.4
Water depth	4-20	3-15	5-15	6-20	6-20

Figure 4. Types of fish caught
Source: personal document

DISCUSSION

The results showed that the most frequently captured fish in the Komering River, Sukadarma Village, belonged to the Cyprinidae family, particularly the seluang fish (*Rasbora agyrotaenia*). The dominance of the Cyprinidae family indicates that this group has a high adaptability to dynamic riverine environmental conditions. Cyprinid fish are known to tolerate fluctuations in water quality, including changes in temperature, pH, and dissolved oxygen (Cahyono *et al.*, 2018). These findings are consistent with the environmental characteristics of the Komering River at the study site, which exhibited a relatively neutral pH range (6.9–7.7) and fairly stable water temperatures (27.6–28.7°C). Such conditions are still favorable for the survival of tropical freshwater fish, particularly species with high environmental tolerance. In addition, the high abundance of seluang fish suggests that the aquatic habitat continues to provide adequate natural food resources and suitable living space for members of the Cyprinidae family.

The dominance of the Cyprinidae family observed in this study is consistent with the findings of Noonin *et al.* (2022) in the Tapee River, Southern Thailand, and Kamrul *et al.* (2021) in Bangladesh, both of which reported Cyprinidae as the family with the highest species richness and abundance in tropical river ecosystems. This similarity suggests that members of the Cyprinidae family possess strong ecological adaptability, enabling them to utilize a wide range of river habitats, particularly waters with diverse flow conditions, substrates, and riparian vegetation. In the Komering River, the presence of vegetated riverbanks and hydrological connectivity with flooded swamp areas are likely important factors supporting the abundance and distribution of cyprinid fish.

The diversity index results showed that Stations 1, 2, 3, and 4 were categorized as having moderate diversity, while Station 5 exhibited a high level of diversity (H’ = 3.42). The high diversity value at Station 5 indicates that the habitat conditions at this station are relatively more stable and capable of supporting a greater variety of fish species. Field observations revealed that Station 5 had the highest number of fish species among all observation stations, with a total of 12 species recorded. This condition is likely associated with the more complex habitat characteristics at the site, including variations in water depth, the presence of aquatic vegetation, and current conditions that facilitate the formation of diverse microhabitats suitable for different fish species.

Fish diversity in the Komering River is strongly influenced by habitat heterogeneity and hydrological conditions. Increased water levels during the study period, caused by rainfall, likely expanded inundated areas and enhanced connectivity among aquatic habitats. These conditions enable fish to migrate more freely and utilize a wider range of food resources and shelter areas. Aprilia and As (2023) reported that habitats with more complex aquatic vegetation generally support higher levels of organism diversity compared to habitats with sparse vegetation. In addition, riparian vegetation along the watershed plays an important role in maintaining habitat stability by contributing organic matter, protecting riverbanks, and reducing erosion and sedimentation processes.

Differences in habitat characteristics among stations are also presumed to contribute to variations in fish composition. Ali *et al.* (2013) and Purwati *et al.* (2021) reported that topography, current velocity, and habitat conditions along a watershed significantly influence fish community structure. In this study, Station 3 exhibited the lowest species richness and the highest dominance index value (C = 0.62), indicating greater ecological pressure or more limited habitat conditions compared to the other stations. The low number of fish species recorded at Station 3 suggests that the habitat may only support certain species that are tolerant of specific environmental conditions. The dominance of the seluang fish, at this station further indicates that species with high adaptability are more capable of surviving under such conditions than other, more sensitive species.

The relationship between the diversity and dominance indices in this study demonstrates a clear pattern: higher diversity values were associated with lower dominance values. This pattern is evident at Station 5, which exhibited high diversity accompanied by a low dominance index. In contrast, Station 3 showed a high dominance value along with low species richness. These findings are consistent with the study of Ulfah *et al.* (2019), which reported that communities with high diversity are generally not dominated by a single species, resulting in a more stable community structure. Such conditions indicate a more balanced distribution of individuals among species and reflect better ecological stability within the aquatic ecosystem.

Hydrological factors are suspected to be the primary drivers influencing fish distribution in the Komering River. Hossain *et al.* (2012) explained that temperature and rainfall are important factors determining the distribution of fish in river ecosystems. In addition, river flow conditions, water depth, and habitat position within the watershed also play significant roles in shaping fish community structure (Febriani *et al*., 2019). In the Komering River, water depth varied among stations, ranging from 3 to 20 meters, thereby creating different habitat conditions for fish communities. Stations with greater depth variation tended to support higher fish species richness because they provide a wider range of ecological niches. Sirait *et al*. (2018) further stated that hydrological factors often exert a stronger influence on aquatic communities than water chemical parameters.

Although the results of this study indicate that the condition of the Komering River remains relatively good, anthropogenic pressures still have the potential to affect the sustainability of fish communities in the future. Agricultural activities and land use changes around the watershed may increase sedimentation and contribute to water pollution. Schürings *et al.*

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(2022) reported that agricultural activities are among the major drivers of freshwater biodiversity decline through alterations in river morphology and increased pollutant inputs. In addition, sedimentation can modify riverbed structure and reduce the quality of fish habitats (Servanzi *et al*., 2024). Such conditions may result in the loss of spawning grounds, nursery habitats, and natural food resources essential for fish survival and reproduction.

In addition to physical and chemical environmental factors, ecological interactions among organisms also influence the structure of fish communities in the Komering River. Erika *et al.* (2018) reported that the presence of predators and competition for food resources can affect the stability of fish communities. The occurrence of introduced species such as Nile tilapia (*Oreochromis niloticus*), and suckermouth catfish (*Hypostomus Plecostomus*), at the study site requires particular attention because these species may disrupt the balance of local fish communities through competition for habitat space and food resources. If environmental pressures and anthropogenic activities continue to increase, gradual changes in fish community composition may occur, especially among native species that are sensitive to habitat alteration.

This study revealed that the Komering River in Sukadarma Village still possesses habitat conditions capable of supporting a variety of freshwater fish species, with moderate to high levels of diversity. However, differences in community structure among observation stations indicate that the ecological conditions of the river habitat are not entirely homogeneous. Therefore, management of the Komering River should prioritize the sustainability of habitats, maintenance of water quality, and preservation of hydrological conditions in order to support fish community stability and conserve aquatic biodiversity.

CONCLUSION

This study recorded 635 individual fish representing 21 species inhabiting the Komering River in Sukadarma Village, Jejawi District, Ogan Komering Ilir Regency, indicating that the river still supports relatively high freshwater fish diversity. The diversity analysis showed moderate diversity at Stations 1–4 (H' = 1.03–2.78) and high diversity at Station 5 (H' = 3.42). Evenness values (E = 0.51–0.98) indicated that fish individuals were generally distributed evenly among species, while dominance analysis showed that only Station 3 was dominated by a single species (C = 0.62), whereas no dominant species occurred at the other stations.

These findings suggest that habitat conditions in most sections of the Komering River remain ecologically stable and capable of supporting diverse fish communities. Therefore, the fish inventory and biodiversity information generated by this study provide an important baseline for monitoring fish community dynamics and developing sustainable fisheries management and freshwater biodiversity conservation strategies in the Komering River.

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