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Enrichment of Fish Resources with Artificial Habitat in Sepunjung Lake Rantau Baru Village, Pangkalan Kerinci, Pelalawan

Pengkayaan Sumber Daya Ikan dengan Habitat Buatan di Danau Sepunjung Desa Rantau Baru, Pangkalan Kerinci, Pelalawan

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Abstract

This research aims to determine the types of fish caught in Lake Sepunjung and in the Artificial Habitat equipment at Lake Sepunjung, Rantau Baru Village, Pangkalan Kerinci, Pelalawan, Riau Province. This research was conducted in January-March 2024 in Lake Sepunjung, Rantau Baru Village, Pangkalan Kerinci, Pelalawan, Riau. This research used a survey method to obtain primary data from water quality measurements and fish caught. Sampling was carried out every 2 weeks for 3 months. The results of this research obtained the value of the composition of the most common type of fish, namely the *Oxgaster anomalura*, with the highest percentage of 44.13%, and in Artificial Habitat, namely *Ompok hypothalamus* fish, with the highest percentage of 28%. The value of the diversity index (H') in Lake Sepunjung is 2.95 (moderate), and the value in Artificial Habitat is 2.83 (moderate). The value of the uniformity index (E) in Lake Sepunjung is 0.622 (low), and the value in Artificial Habitat is 0.894 (low). The value of the dominance index (C) obtained in Lake Sepunjung, namely 0.233 (low), and the value in Artificial Habitat, namely 0.165 (low).

Keywords: Artificial Habitat, Lake Sepunjung, Enrichment of Fish Resources.

Abstrak

Penelitian ini bertujuan untuk mengetahui jenis ikan yang tertangkap di Danau Sepunjung dan pada alat Habitat Artificial Danau Sepunjung, Desa Rantau Baru, Pangkalan Kerinci, Pelalawan, Riau. Penelitian ini dilakukan pada bulan Januari-Maret 2024 di Perairan Danau Sepunjung, Desa Rantau Baru, Pangkalan Kerinci, Pelalawan, Riau. Penelitian ini dilakukan dengan metode survei untuk mendapatkan data primer berupa hasil pengukuran kualitas air dan ikan yang tertangkap. Pengambilan sampel dilakukan 2 minggu sekali selama 3 bulan. Hasil dari penelitian ini diperoleh nilai komposisi jenis ikan yang banyak didapatkan pada Danau Sepunjung, yaitu ikan *Oxgaster anomalura* jenis ikan dengan presentase tertinggi 44,13% dan pada Artificial Habitat, yaitu ikan *Ompok hypopthalmus* dengan persentase tertinggi 28%. Nilai indeks keanekaragaman (H‘) di Danau Sepunjung, yaitu 2,95 (sedang) dan pada Artificial Habitat, yaitu 2,83 (sedang). Nilai indeks keseragaman (E) di Danau Sepunjung, yaitu 0,622 (rendah) dan pada Artificial Habitat, yaitu 0,894 (rendah). Nilai indeks dominansi (C) didapatkan di Danau Sepunjung, yaitu 0,233 (rendah) dan nilai pada Artificial Habitat, yaitu 0,165 (rendah).

Kata kunci: Habitat Buatan, Danau Sepunjung, Pengkayaan Sumberdaya Ikan

1. Introduction

Sepunjung Lake (Janda Lake) is an oxbow lake in Rantau Baru Village, Pangkalan Kerinci District, Pelalawan Regency, Riau Province. Sepunjung Lake is an oxbow lake formed as a result of disruption to the flow of the Kampar River. Sepunjung Lake is unique because it is reserved exclusively for widows in Rantau Baru Village who work as fishermen. Additionally, the local community utilizes the lake for fishing activities.

The catch from these fishermen serves as the local residents' primary income source. The higher the fish production, the better the welfare of the fishermen, their fishing activities, and the local government's revenue (Khaeruddin et al., 2018). The lake covers an area of 6.58 ha, comprising 4.52 ha of open water and 3.06 ha of water covered by aquatic plants. However, the lake faces declining water quality, siltation, and reduced water productivity due to being overgrown by aquatic plants.

Intensive fishing and water quality degradation also contribute to declining fishing production. Therefore, efforts to enrich public water resources, such as creating artificial habitats, are needed. One example of a thriving artificial habitat is the 'Fish Apartment,' which is vital in restoring the balance of coastal water ecosystems. Previous research on Artificial Habitats has been conducted by (Budijono et al., 2023) at Koto Panjang Reservoir. The application of Artificial Habitat devices at Koto Panjang Reservoir has been implemented, with the first report showing that more fish were caught using the raffia rope medium (56%) compared to the plastic bottle packaging medium (12%).

2. Materials and Methods

2.1. Time and Place

This study was conducted at Lake Sepunjung, Rantau Baru Village, Pangkalan Kerinci, Pelalawan, Riau Province (Figure 1), from January to March 2024.

Figure 1. Research location

2.2. Methods

The research method used was a survey, with fish sampling at Lake Sepunjung and fish identification at the Aquatic Biology Laboratory, Faculty of Fisheries and Marine Sciences, Universitas Riau. The primary and secondary data were obtained from field observations, interviews, and literature studies. According to Saanin (1994), fish identification was carried out using an identification guidebook.

2.3. Procedure

2.3.1. Determining the Sample Collection Location

Fish sampling was conducted based on fishermen's customary practice of catching fish outside artificial habitats in Lake Sepunjung (Lake Janda). For fish samples from artificial habitats, three observation points with distinct characteristics were selected at predetermined locations (Figure 1), with each sampling point as follows: Observation Point 1: Located in the area where the Kampar River flows into Oxbow Lake. Observation Point 2: Located in the curved part of the Oxbow Lake or the central area. Observation Point 3: Located at the tip of the Oxbow Lake.

2.3.2. Collection of Fish Samples

Fish sampling was conducted once every two weeks for three months. Fresh fish samples of different species and sizes ranging from small, medium, and large were collected. Fish samples were caught directly using fishing gear commonly used by local fishermen. The fishing gear used includes gill nets (jarring insane) with a net length of 100 m, width of 1.3 m, and mesh size of 1–3 inches, and Bubu (PxLxT) with dimensions of 100x75x60 cm and a mesh size of 5 cm. The equipment used in the artificial habitat is umbrella traps with eight holes, a diameter of 95 cm, an open height of 36 cm, a folded height of 61 cm, a hole width of 17 cm, and a hole height of 12 cm. The fish samples caught are placed in a coolbox and covered with ice to keep them fresh and durable.

2.3.3. Description of Fishing Gear and Artificial Habitat

The fishing gear used during the study were gill nets and traps made of wood and netting. The gill nets were 100 m long, 1.3 m wide, and had a 1-3 inches mesh size. The traps were made of wood and netting. The dimensions of the trap (L×W×H) are 100×75×60 cm, with a mesh size of 5 cm. The artificial habitat structures are vertical and horizontal floating structures consisting of three boxes (3 m³) made of PVC pipes. Each box has eight iron attractors and 50 strands of rope. The fishing gear installed is a specific type of umbrella net. Groups of artificial habitat structures are placed separately at a distance of 100 m (Figure 2).

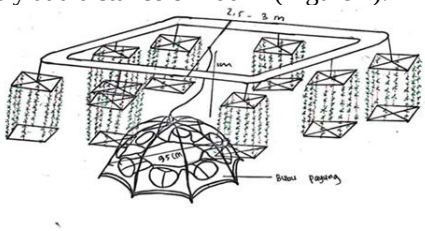

Figure 2. Artificial habitat

2.4. Data Analysis

The data were presented in narrative form, tables, and figures, then analyzed descriptively to determine fish species composition, diversity, uniformity, and dominance.

3. Result and Discussion

3.1. Types of Fish Caught in Lake Sepunjung (Lake Janda) and Types of Fish Caught in Artificial Habitats

Based on the results of sample fish catches conducted in Lake Sepunjung (Lake Janda) in Rantau Baru Village during the study, a total of 639 fish were caught in Lake Sepunjung (Lake Janda), belonging to 27 species, and 36 fish were caught in the artificial habitat in Lake Sepunjung (Lake Janda), belonging to 9 species.

Table 1. Types of fish caught in Lake Sepunjung, Rantau Baru Village

No.	Ordo	Famili	Genus	Spesies	Nama Lokal
1.	Cypriniformes	Cyprinidae	Hampala	*Hampala macrolepidota*	Barau
			Thynnichthys	*Thynnichthys leavis*	Motan
			Rasbora	*Rasbora sumatrana*	Pantau beras
			Luciosoma	*Luciosoma trinema*	Pantau seluang
			Barbodes	*Barbodes collingwoodi*	Umbut-umbut
				Barbodes binotatus	Puyau
			Oxygaster	*Oxgaster anomalura*	Sepimping
			Esomus	*Esomus metallicus*	Pantau jenggot
			Osteochilus	*Osteochilus melanopleura*	Kelabau
			Leptobarbus	*Leptobarbus hoeveni*	Kalomak
			Puntius	*Puntius bulu*	Subahan
			Amblyrhynchichthys	*Amblyrhynchichthys truncatus*	Tabingalan
2.	Cyprinodontiformes	Hemiramphidae	Hemiramphodon	*Hemiramphodon phaiosoma*	Julung-julung
3.	Perciformes	Channidae	Channa	*Channa lucius*	Bujuk
				Channa marulioides	Jalai
				Channa striata	Gabus
				Channa micropeltes	Toman
		Helostomatidae	Helostoma	*Helostoma temminckii*	Tuakang
4.	Siluriformes	Chandidae	Parambassis	*Parambassis wolffii*	Sipongkah
		Belontidae	Belontia	*Belontia hasselti*	Selincah
			Trichogaster	*Trichogaster leerii*	Sepat mutiara
		Pangasiidae	Pangasius	*Pangasius macronema*	Juaro rimbo
		Clariidae	Clarias	*Clarias batrachus*	Lele batrachus
		Bagridae	Mystus	*Mystus nigriceps*	Ingir-ingir
			Hemibagrus	*Hemibagrus nemurus*	Baung
		Siluridae	Ompok	*Ompok eugeneiatus*	Selais giabai
5.	Synbranchiformes	Synbrancidae	Monopterus	*Monopterus albus*	Belut
	Total				27 Types of fish

Table 1 shows that the most commonly found fish species belong to the Cyprinidae family, with 12 species found, the highest number found during the study. The high number of species from the Cyprinidae family is because this family is the most prominent freshwater fish family in every region of the world except Australia, Madagascar, South America, and New Zealand (Kottelat et al., 1993).

Table 2 shows that nine fish species were caught using artificial habitats in Lake Sepunjung (Lake Janda) during the study. Five species were from the Cyprinidae family, the most abundant family in the study. The high number of species from the Cyprinidae family is due to this family being the most prominent freshwater fish family in every region except Australia, Madagascar, South America, and New Zealand (Kottelat et al., 1993).

The most abundant fish caught in the artificial habitat was found on the raffia rope attractor, with 18 individuals, the most abundant species being the lake sells fish with six individuals, followed by the artificial habitat on the yellow rope, with 13 individuals, the most abundant species being the pearl gourami with four individuals.

Table 2. Types of Fish Caught in Artificial Habitat Media in Lake Sepunjung (Lake Janda)

No.	Ordo	Famili	Genus	Spesies	Nama Lokal
1.	Cypriniformes	Cyprinidae	Osteochilus	*Osteochilus melanopleura*	Kelabau
				Osteochilus hasselti	Paweh
			Puntius	*Puntius bulu*	Subahan
			Hampala	*Hampala macrolepidota*	Barau
		Channidae	*Luciosoma*	*Luciosoma trinema*	Pantau seluang
2.	Perciformes		Osprhronemus	*Osprhronemus gourami*	Gurame
		Belontidae	Trichogaster	*Trichogaster leerii*	Sepat mutiara
		Siluridae	Ompok	*Ompok hypothalamus*	Selais danau
3.	Siluriformes	Bagridae	Bagrichthys	*Bagrichthys micranodus*	Baung hitam
	Total				9 Types of fish

3.2. Diversity Index (H'), Uniformity Index (E), Dominance Index (C) of Fish Caught in Lake Sepunjung and Artificial Habitat

From the data analysis, the fish species diversity index (H') in Lake Sepunjung (Lake Janda) was 2.95, meaning the diversity is moderate. Similarly, the results of data analysis obtained from the Artificial Habitat Device showed a fish species diversity index (H') of 2.83, indicating moderate diversity with moderate distribution of individuals per species. According to Odum (1971), the classification of diversity values is as follows: H>3, high species diversity; 1<H<3, moderate diversity; and H<1, low diversity.

The species uniformity index (E) value in Lake Sepunjung (Lake Janda) was 0.622, which falls into the low category. Similarly, the results of the data analysis obtained from the Artificial Habitat Tool show that the species uniformity index (E) is 0.894. This value indicates that species uniformity in Lake Sepunjung, which has relatively few species or individuals of each species, is low. This is because the number of fish caught in each species is almost the same.

The results of the fish species dominance index (C) in Lake Sepunjung (Lake Janda) were 0.233, which is classified as low. Similarly, the results of the data analysis obtained from the Artificial Habitat Device for the fish species dominance index (C) were 0.165, which also falls into the low category. Both values fall into the low category, meaning no species dominates others or the stable community structure. The dominance index indicates the richness of the community and the balance of the number of individuals of each species.

4. Conclusions

Research conducted at Lake Sepunjung (Lake Janda), Rantau Baru Village, revealed that the fish species Oxygaster anomalura dominates with a percentage of 44.13%, while in the Artificial Habitat, it is dominated by the fish species Ompok hypophthalmus (28%). The diversity index (H') is classified as moderate, with a value of 2.95 in the lake and 2.83 in the Artificial Habitat. The evenness index (E) is low, at 0.622 and 0.894, respectively. The dominance index (C) is also low, at 0.233 in the lake and 0.165 in the artificial habitat.

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