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Checklist of native freshwater fish from Surabaya River, Indonesia

ABDUL R. FAQIH[1], RR. JUNI TRIASTUTI[2], DITA WISUDYAWATI[3], SEPTI ANITASARI[1], VIOL D. KHARISMA[4], RAHMI RAHAYU[5], HERI CAHYONO[6], JILA SULIASTINI[7], R. ADHARYAN ISLAMY[1], FITRI S. VALEN[8], MUHAMMAD B. TAMAM[9], PRIGI ARISANDI[10], JOSIE SOUTH[11], AHMAD S. KAMARUDIN[12], ALIFA K. WIJAYA[3], VERYL HASAN[3,12,13,♥]

[1]Department of Aquatic Resources Management, Faculty of Fisheries and Marine Sciences, Universitas Brawijaya. Jl. Veteran, Malang 65145, East Java, Indonesia
[2]Department of Marine, Faculty of Fisheries and Marine, Universitas Airlangga. Jl. Dr. Ir. Sukarno, Surabaya 60115, East Java, Indonesia
[3]Department of Aquaculture, Faculty of Fisheries and Marine, Universitas Airlangga. Jl. Dr. Ir. Sukarno, Surabaya 60115, East Java, Indonesia. Tel.: +62-31-5914042, Fax.: +62-31-5915551, ♥email: veryl.hasan@fpk.unair.ac.id
[4]Doctoral Program in Mathematics and Natural Science, Faculty of Science and Technology, Universitas Airlangga. Jl. Dr. Ir. Sukarno, Surabaya 60115, East Java, Indonesia
[5]Graduate Program of Fisheries and Marine Biotechnology, Universitas Airlangga. Jl. Dr. Ir. Sukarno, Surabaya 60115, East Java, Indonesia
[6]Mola Molly Aquatic. Jl. Soekarno Hatta 270, Ponorogo 63411, East Java, Indonesia
[7]Technical Service Unit of Fish and Environmental Health Laboratory. Bajang, Sidepan, Winongan, Pasuruan 67182, East Java, Indonesia
[8]Department of Aquaculture, Faculty of Agriculture, Fisheries and Biology, Universitas Bangka Belitung. Jl. Kampus Terpadu UBB, Bangka 33127, Bangka Belitung, Indonesia
[9]Department of Biology, Faculty of Science, Technology and Education, Universitas Muhammadiyah Lamongan. Jl. Raya Plalangan KM 02, Lamongan 62218, East Java, Indonesia
[10]Ecological Observation and Wetland Conservation (ECOTON). Kandangasin, Wringinanom, Gresik 61176, East Java, Indonesia
[11]School of Biology, Faculty of Biological Sciences, University of Leeds. Woodhouse, Leeds LS2 9JT, United Kingdom
[12]School of Animal Science, Aquatic Science and Environment, Universiti Sultan Zainal Abidin. Besut Campus, Besut 22200, Terengganu, Malaysia
[13]Research Group of Environmental and Fisheries Resources Management, Faculty of Fisheries and Marine Sciences, Universitas Airlangga. Jl. Dr. Ir. Sukarno, Surabaya 60115, East Java, Indonesia

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Abstract. *Faqih AR, Triastuti RRJ, Wisudyawati D, Anitasari S, Kharisma VD, Rahayu R, Cahyono H, Suliastini J, Islamy RA, Valen FS, Tamam MB, Arisandi P, South J, Kamarudin AS, Wijaya AK, Hasan V. 2026. Checklist of native freshwater fish from Surabaya River, Indonesia. Biodiversitas 27 (3): d270327. https://doi.org/10.13057/biodiv/d270327.* Surabaya River is a tributary of the Brantas River and is habitat to several freshwater fish species. The aim of this study was to provide information on the species composition of freshwater fish in the Surabaya River, one of the most important rivers in East Java, Indonesia. All samples used in this study were caught from December 25, 2025, to January 25, 2026. Sampling was conducted at three stations on the Surabaya River: the starting point of the bifurcation at Mlirip Sluice Gate, Mojokerto Regency (Station 1); Krian Sub-District, Sidoarjo Regency (Station 2); and the end of the river at Jagir Sluice Gate, Surabaya City (Station 3). Specimens were identified using specialized papers and books. This work recorded 35 fish species across 31 genera and 17 families. Cyprinidae was the dominant family, comprising 10 genera and 11 species. Station 1 had the highest species richness (34 species), while Station 3 had the lowest (17 species). Several species endemic of Java, such as Java walking catfish *Clarias batrachus*, Asian redtail catfish *Hemibagrus nemurus*, wrestling halfbeak *Dermogenys pusilla*, and spotted barb *Barbodes binotatus*, were found in this study, indicating that further attention is needed to preserve their habitat. The new information on freshwater fish diversity across different parts of the river will be useful for updating the current database on Javanese freshwater fish species diversity and for providing an updated native species inventory for three segments during the 2025-2026 sampling. Information on the habitat use and ecological interactions of fish occurring in the Surabaya River is urgently needed to make appropriate conservation decisions and plans.

Keywords: Aquatic ecosystem, biodiversity, Brantas Basin, conservation, Ichthyofauna

INTRODUCTION

Fish are a diverse group of vertebrates, representing more than 50% of all vertebrate species and occurring in almost all aquatic environments worldwide, including ocean and inland waters (Nelson et al. 2016). Sundaland, including Indochina, the Malay Peninsula, Borneo, Sumatra, and Java, is one of the regions with the highest freshwater fish biodiversity in the world (Roberts 1989; Rainboth 1996; Kottelat 2013). These regions contain several big rivers with varied topographies since the last glacial era (Voris 2000; Sathiamurthy and Voris 2006). On islands separated by rising sea levels, different speciation events occur as organisms adapt to geographic isolation. In Western Indonesia, Java is the smallest island but has a high species richness of freshwater fish, although lower than that of other islands (Kottelat et al. 1993; Hasan et al. 2022). Given the heterogeneity and complexity of tropical island freshwater systems, a thorough understanding of species trends and distributions in Java is essential, as many threatened species inhabit this island (Roberts 1993; Hasan et al. 2022). Java has high biodiversity not only in freshwater fish but also in other taxonomic groups. However, Java is the most populous island, with approximately 150 million people (Mardiansjah et al. 2023). Therefore, its natural environment and resources are under substantial anthropogenic pressure. Human activities, such as habitat modification, overfishing, and the introduction of alien species, as well as natural factors such as sea-level rise and global climate change, pose threats to ichthyofaunal diversity in freshwater systems (Widodo et al. 2020; Hasan et al. 2021a).

Java consists of limestone mountains with many rivers used by local communities as water sources and for inland fisheries (Hasan et al. 2021b; Setyanto et al. 2025). These fisheries are exploited along the river basin, from headwaters to lower reaches and the estuarine zone. Some species are estuarine migrants adapted to low salinity and can be found in the lower reaches of rivers. Riverside communities have long used these fish as a source of animal protein, while some are also traded as aquarium fish. Previous research by Hasan et al. (2022) collected data on freshwater fish in the Brantas River from upstream to downstream. However, research on its tributaries, especially the Surabaya River, which passes through the Fish Sanctuary area, has not been recorded in detail.

One of the main rivers in Java is the Surabaya River in East Java, a branch of the Brantas River. A small section of the Surabaya River, approximately 11 km from the starting point, has been designated as a fish protection sanctuary according to Governor's Decree No. 188/229/KPTS/013/2014 (Dewantari et al. 2022). This highlights the importance of the Surabaya River as a natural habitat for freshwater fish. The river flows from Mojokerto Regency to Surabaya City for approximately 50 km. The Surabaya River is crucial for local communities because it is the largest supplier of raw water for Surabaya City and the surrounding areas (Dewantari et al. 2022). It also provides socio-economic value because it is widely used for domestic activities, tourism, agriculture, and other economic purposes (Dewantari et al. 2022; Fahmi et al. 2025).

Like most rivers in Java, the Surabaya River is subject to high anthropogenic pressure, including inland fisheries for human consumption (Valen et al. 2020; Widodo et al. 2020). There is no recent data on the fish assemblage of the Surabaya River, especially across three river segments: the beginning of the branch with the main river (Brantas River), the middle of the river, and the end of the river before entering the estuary. Apart from the accumulation of environmental pressures, freshwater fish have a tolerance to salinity, so that the further downstream they go, the lower their diversity becomes. Current data on freshwater fish species diversity is the basis for conservation programs because diversity patterns are indicators of the health of aquatic ecosystems and the balance of food webs. This information is useful for conservation programs, such as domestication or the creation of fish conservation area and developing sustainable inland fisheries management policies to support socio-ecological systems. This research aims to inventory fish in the Surabaya River and determine the composition of native fish species across three segments.

MATERIALS AND METHODS

Study area

This study was carried out in three segmentation areas of Surabaya River, East Java, Indonesia: Mlirip Sluice gate (Station 1), the mid-river at Krian Sub-District (Station 2), and the end of the river at Jagir Sluice gate (Station 3). Figure 1 and Table 1 show the position of Surabaya River, estimated distances between three stations, and a general description of the sampling site.

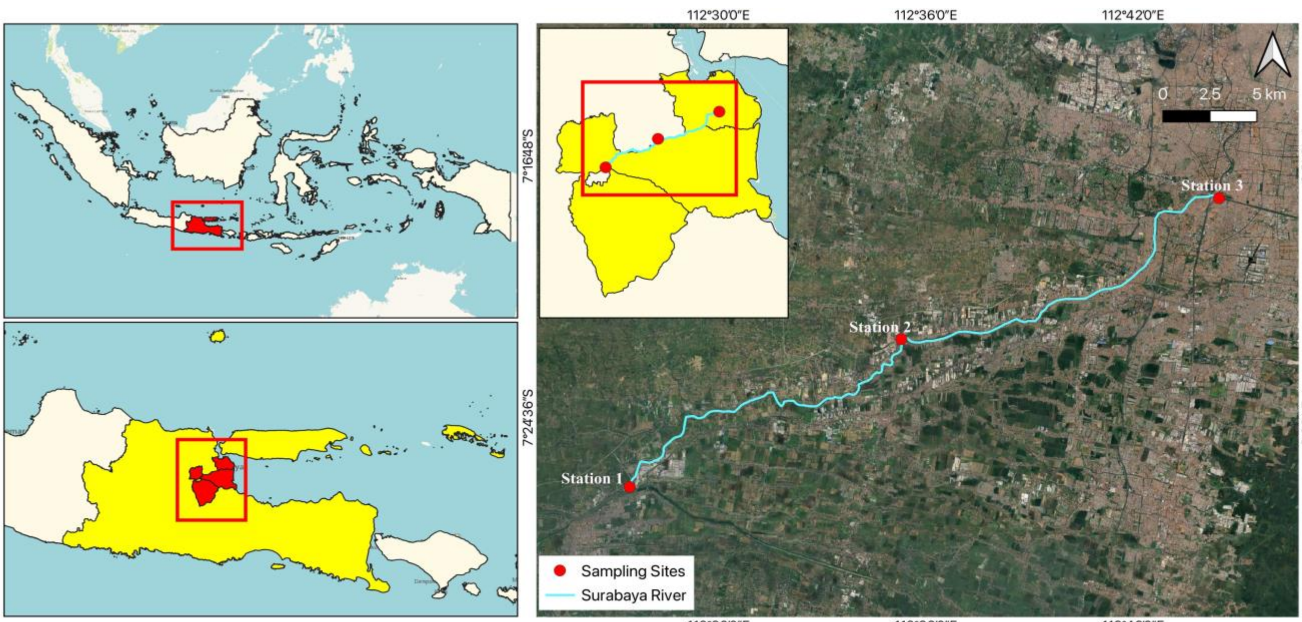

Figure 1. Collecting sites of Surabaya River, East Java, Indonesia. Mlirip Sluice gate, Mojokerto Regency (Station 1), Krian Sub-District, Sidoarjo Regency (Station 2), and the end of the river at Jagir Sluice gate, Surabaya City (Station 3), East Java, Indonesia

Table 1. Coordinates, river segmentation, and description of the sampling sites

Station	Coordinates	Location	Administrative area	Site description
1	7°26'39.8"S 112°27'25.9"E	Mlirip Sluice Gate	Mojokerto Regency	Wide 25m, riverbank consists of medium vegetation, fast water flow, with sandy substrate
2	7°22'15.3"S 112°35'17.7"E	Krian Sub-District	Sidoarjo Regency	Wide 30m, riverbank consists of dense vegetation, medium fast water flow, with sandy mud substrate
3	7°18'02.9"S 112°44'29.5"E	Jagir Sluice Gate	Surabaya City	Wide 35m, there is no vegetation on the riverbank, only a concrete wall to prevent landslide, fast water flow, with mud substrate

Water quality

The water quality parameters temperature (°C), pH, dissolved oxygen (DO) (ppm), and water flow (m/s) were measured at three locations immediately after specimen collection. Water quality measurement does not use a kit; instead, a portable tool (temperature, pH, and DO) is used, with calibration for each measurement. Specifically for water flow, use a current meter without calibration. Observations were conducted under optimal and minimum water conditions to obtain a range of data that described overall water quality. Water quality measurements are taken at the morning and afternoon sampling times to determine the difference in distance. Observations were made when the sluice gates were closed.

Fish collection and species identification

The specimens were collected using cast nets (ca. 2 cm mesh size, 12 feet wide). This net size allows catching adult and sub-adult fish (2-3 cm TL) with landing nets (ca. 5 feet, mesh 0.5 cm). Apart from using nets, some fish are caught using medium hooks and fish traps. Fishing time is 2 hours per day. In one day, 3 stations were directly sampled with a repetition interval of about one week. Selectivity, habitat coverage (main river only; no tributary streams), and seasonal window (1 month). All fish samples were identified morphologically according to Kottelat et al. (1993). Sampling was conducted in the main river, not in smaller streams. Samples were limited to native fish, so non-native fish, particularly Cichlids and Loricariids, were not recorded (Widodo et al. 2021; Islamy et al. 2026). The current taxonomic classification of each species was checked in Fricke et al. (2022a, 2022b). The specimens were preserved in 10% formalin. Selected specimens were deposited in the Anatomy Laboratory, Faculty of Fisheries and Marine, Universitas Airlangga, Surabaya, Indonesia. One specimen voucher is kept for each species. The specimens were collected from December 25, 2025, to January 25, 2026. This research does not require special permission because it is a public catchment area for the community.

Data analysis

Fish sampling efficiency was assessed using a species accumulation curve in R with the "vegan" package (Oksanen et al. 2025), comparing observed species values (Sobs) with Michaelis-Menten and Chao1, and the Abundance-based Coverage Estimator (ACE) (Clarke and Gorley 2015). Visualization was performed using "iNext" (Hseih et al. 2025).

RESULTS AND DISCUSSION

Fish species found in the Surabaya River

This work recorded 35 species (Figure 2) divided into 31 genera and 17 families (Table 2). Sampling efficiency was near complete with S_{obs}: 35, Chao1: 35, ACE: 35, and Michaelis Menten: 36.97, suggesting slight incompleteness. The sampling covered 94% of expected species based on the curves from observed fish species values (S_{obs}) (Figure 3). Using the R package vegan, we calculated the observed species richness (S_{obs}) and fit the Michaelis-Menton species accumulation model to random accumulation curves across sampling sites to determine the expected total species richness (36.98). Therefore, the observed richness covers 94% of the expected richness.

Considering all the freshwater fish recorded in this study, some of them were widespread across the river and occurred in all three stations: *Rasbora argyrotaenia*, *Barbodes binotatus*, *Cyclocheilichthys apogon*, *Labeo chrysophekadion*, *Labiobarbus leptocheilus*, *Mystacoleucus obtusirostris*, *Osteochilus vittatus*, *Systomus rubripinnis*, *Barbonymus gonionotus*, *Barbonymus balleroides*, *Hampala macrolepidota*, *Oxyeleotris marmorata*, *Osphronemus goramy*, *Hemibagrus nemurus*, *Mystus singaringan*, *Mystus nigriceps*, *Mystus abbreviatus*, *Glossogobius giuris*, *Trichopodus trichopterus*, *Pangasius djambal*, *Pseudolais micronemus*, *Monopterus javanensis*, *Anabas testudineus*, *Dermogenys pusilla*, *Channa striata*, and *Aplocheilus armatus.*

On the other hand, some species were rarer, being recorded only in one of the three stations, such as *Neolissochilus soro*, *Laides hexanema*, *Oryzias javanicus*, and *Rasbora* cf. *lateristriata* (AMNH166). The assignment of a special number to *R.* cf. *lateristriata* because this individual requires further research. Most fish genera in the Surabaya River have only one species (31 genera), while the genus with the most species is *Mystus*, namely *M. singaringan*, *M. nigriceps*, and *M. abbreviatus*.

Figure 2. Freshwater fish collected from Surabaya River, East Java, Indonesia. A. *Notopterus notopterus*, B. *Rasbora argyrotaenia*, C. *Rasbora* cf. *lateristriata*, D. *Barbodes binotatus*, E. *Barbonymus balleroides*, F. *Barbonymus gonionotus*, G. *Cyclocheilichthys apogon*, H. *Labeo chrysophekadion*, I. *Labiobarbus leptocheilus*, J. *Mystacoleucus obtusirostris*, K. *Osteochilus vittatus*, L. *Systomus rubripinnis*, M. *Neolissochilus soro*, N. *Hampala macrolepidota*, O. *Hemibagrus nemurus*, P. *Mystus singaringan*, Q. *Mystus nigriceps*, R. *Mystus abbreviatus*, S. *Glossogobius giuris*, T. *Clarias batrachus*, U. *Pangasius djambal*, V. *Pseudolais micronemus*, W. *Laides hexanema*, X. *Anabas testudineus*, Y. *Trichopodus trichopterus*, Z. *Trichopsis vittata*, AA. *Osphronemus goramy*, AB. *Channa striata*, AC. *Oxyeleotris marmorata*, AD. *Mastacembelus unicolor*, AE. *Macrognathus aculeatus*, AF. *Monopterus javanensis*, AG. *Oryzias javanicus*, AH. *Aplocheilus armatus*, AI. *Dermogenys pusilla*

Table 2. Fishes recorded by this study

Family	Genera	Species	Station			IUCN
			1	2	3	
Notopteridae	*Notopterus*	*Notopterus notopterus* (Pallas 1769)	✓	✓	X	LC
Danionidae	*Rasbora*	*Rasbora argyrotaenia* (Bleeker 1849)	✓	✓	✓	LC
		Rasbora cf. *lateristriata**	✓	X	X	-
Cyprinidae	*Barbodes*	*Barbodes binotatus* (Valenciennes 1842)	✓	✓	✓	LC
	Barbonymus	*Barbonymus balleroides* (Valenciennes 1842)	✓	✓	✓	LC
		Barbonymus gonionotus (Bleeker 1849)	✓	✓	✓	LC
	Cyclocheilichthys	*Cyclocheilichthys apogon* (Valenciennes 1842)	✓	✓	✓	LC
	Labeo	*Labeo chrysophekadion* (Bleeker 1849)	✓	✓	✓	LC
	Labiobarbus	*Labiobarbus leptocheilus* (Valenciennes 1842)	✓	✓	✓	LC
	Mystacoleucus	*Mystacoleucus obtusirostris* (Valenciennes 1842)	✓	✓	✓	LC
	Osteochilus	*Osteochilus vittatus* (Valenciennes 1842)	✓	✓	✓	LC
	Systomus	*Systomus rubripinnis* (Valenciennes 1842)	✓	✓	✓	LC
	Neolissochilus	*Neolissochilus soro* (Valenciennes 1842)	✓	X	X	LC
	Hampala	*Hampala macrolepidota* (Kuhl & van Hasselt 1823)	✓	✓	✓	LC
Bagridae	*Hemibagrus*	*Hemibagrus nemurus* (Valenciennes 1840)	✓	✓	✓	LC
	Mystus	*Mystus singaringan* (Bleeker 1846)	✓	✓	✓	LC
		Mystus nigriceps (Valenciennes 1840)	✓	✓	✓	LC
		Mystus abbreviatus (Valenciennes 1840)	✓	✓	✓	LC
Gobidae	*Glossogobius*	*Glossogobius giuris* (Hamilton 1822)	✓	✓	✓	LC
Clariidae	*Clarias*	*Clarias batrachus* (Linnaeus 1758)	✓	✓	X	LC
Pangasiidae	*Pangasius*	*Pangasius djambal* (Bleeker 1846)	✓	✓	✓	LC
	Pseudolais	*Pseudolais micronemus* (Bleeker 1846)	✓	✓	✓	LC
Ailiidae	*Laides*	*Laides hexanema* (Bleeker 1852)	✓	X	X	LC
Anabantidae	*Anabas*	*Anabas testudineus* (Bloch 1792)	✓	✓	✓	LC
Osphronemidae	*Trichopodus*	*Trichopodus trichopterus* (Pallas 1770)	✓	✓	✓	LC
	Trichopsis	*Trichopsis vittata* (Cuvier 1831)	✓	✓	X	LC
	Osphronemus	*Osphronemus goramy* (Lacepède 1801)	✓	✓	✓	LC
Channidae	*Channa*	*Channa striata* (Bloch 1793)	✓	✓	✓	LC
Eleotridae	*Oxyeleotris*	*Oxyeleotris marmorata* (Bleeker 1852)	✓	✓	✓	LC
Mastacembelidae	*Mastacembelus*	*Mastacembelus unicolor* (Cuvier 1832)	✓	✓	X	LC
	Macrognathus	*Macrognathus aculeatus* (Bloch 1786)	✓	✓	X	LC
Synbranchidae	*Monopterus*	*Monopterus javanensis* (Zuiew 1793)	✓	✓	✓	LC
Adrianichthyidae	*Oryzias*	*Oryzias javanicus* (Bleeker 1854)	X	X	✓	LC
Aplocheilidae	*Aplocheilus*	*Aplocheilus armatus* (van Hasselt 1823)	✓	✓	✓	-
Zenarchopteridae	*Dermogenys*	*Dermogenys pusilla* (Kuhl & van Hasselt, 1823)	✓	✓	✓	DD

Notes: *species requiring further identification

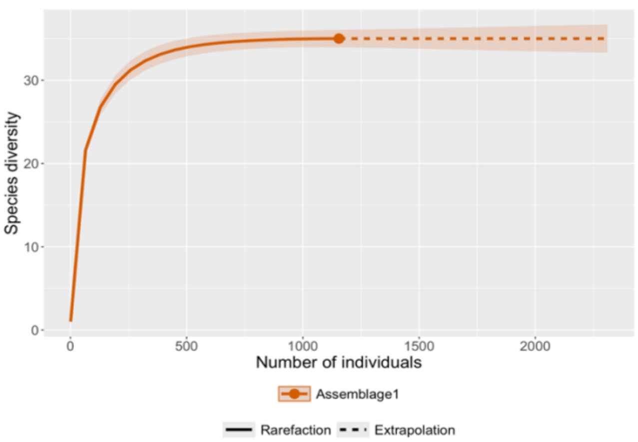

Figure 3. Species accumulation curve using rarefaction and extrapolation for Surabaya River, East Java, Indonesia

Cyprinidae was the dominant family, comprising 10 genera and 11 species. This family is widespread from Station 1 to Station 2. The dominance of Cyprinidae is supported by other studies conducted in several locations in Southeast Asia (Rainboth 1996; Kottelat et al. 2013). Cyprinidae have a wide distribution range and are tolerant of less extreme environmental changes. Another advantage is their high survival rate with relatively high fecundity (Efizon et al. 2021). These factors may support the dominance of Cyprinidae in Java. These fish are considered quite adaptable to environmental pressures, as they persist in all segments of the Surabaya River, although their populations can fluctuate at each station. Most of these fish are omnivorous, offering a broader diet. Furthermore, they can spawn year-round, resulting in a more rapid life cycle (Nelson et al. 2016).

Neolissochilus soro and *L. hexanema* are rarely found in the Surabaya River because they are most vulnerable to environmental changes and require a high oxygen current, especially in the mahseer species *N. soro*, while environmental pressures in the Surabaya River downstream are increasing (Nelson et al. 2016). This is why both fish were only recorded at Station 1 as the starting point of the river, where environmental pressure is relatively less. A special case of *O. javanicus* was found only at Station 3 because this fish is a brackish-water species that can adapt to fresh water. This species can move to fresh water because it is carried by tidal currents (Mokodongan et al. 2020, 2025).

Data on population dynamics, habitat use, ecological interactions of fish in the Surabaya River, and fishing pressure are essential for making informed conservation decisions consistent with sustainable resource management. This needs to be done at the watershed level due to the connectivity and pressures within the system. Therefore, we recommend increased sampling in the Surabaya River watershed. Sampling studies using eDNA analysis will improve sampling effectiveness, and research combining morphological and molecular data will help uncover taxonomic uncertainties in cryptic species. This is the case with *R.* cf. *lateristriata*. This species is a species complex, and its status remains uncertain because the native *R. lateristriata* is limited to mountainous areas in West Java. It is strongly suspected that the *R.* cf. *lateristriata* species in the Surabaya River is a separate species, or synonym, of *R. baliensis*, which was previously separated from *R. lateristriata* (Hubert et al. 2019).

Water parameters

The water quality parameters varied between the stations (Table 3). In general, the water parameters in all Surabaya River stations are in the range of freshwater fish habitat quality standards (Boyd 2000), except for the speed of the current, this is because the floodgates make the current faster than usual. These stations possess reasonable water quality suitable for freshwater fish. However, given the high rates of specialization in freshwater fishes, any environmental degradation will likely exert environmental filtering on the assemblage, with implications for the ecological functioning of the freshwater system. Further research is needed on water quality using more specific parameters, such as turbidity, total dissolved solids, total organic matter, and heavy metal pollution. Temperature, pH, DO, and water flow are the basic parameters sufficient to describe air quality for wild fish, while other parameters, such as ammonia, nitrite and nitrate, are more suitable for water quality in aquaculture (Boyd 2000).

Table 3. Water parameters at each Station

Parameters	Station 1	Station 2	Station 3	Boyd (2000)
Temperature (°C)	29-31	29-31	30-32	28-32
pH	7.1-7.3	6.8-7.0	6.5-6.8	6.8-8.5
DO (mg/L)	6.0-6.8	5.5-6.2	6.6.-6.8	>4
Water flow (m/s)	1.2-1.5	0.3-0.5	1.0-1.5	0.2-0.5

Discussion

Conservation status

According to the IUCN Red List, the majority of fish species inhabiting the Surabaya River have a conservation status of Least Concern (LC), except that *R.* cf. *lateristriata* has not been assessed because its status is still cryptic. *N. notopterus* is only partially protected by the Indonesian government (Ministry of Maritime Affairs and Fisheries Indonesia 2024), even though this species is a major raw material for common foods in Indonesia. We suggest conducting an urgent fisheries assessment to determine the population of *N. notopterus* in East Java (Hasan et al. 2022). *N. soro* is the only remaining mahseer species in the Surabaya River. In general, mahseer is the rarest species of fish in Indonesia and requires special conditions, such as high oxygen levels (Haryono 2006).

Several species have been recorded (since Pieter Bleeker 1842-1860) but are not represented in this study, such as *Cyclocheilos enoplos* (Bleeker 1863), *Pangasius macronema* (Bleeker 1862; Jenkins et al. 2020), *Lepidocephalichthys hasselti* (Bleeker 1863), *Leptobarbus hoevenii* (Bleeker 1863), *Kalimantania lawak* (Bleeker 1863; Lumbantobing 2020b), *Crossocheilus cobitis* (Bleeker 1863), *Crossocheilus oblongus* (Bleeker 1863; Doi 1997), *Barbichthys laevis* (Bleeker 1863), *Cyclocheilichthys armatus* (Bleeker 1863; Weber and de Baaufort 1916), *Luciosoma setigerum* (Bleeker 1863), *Systomus brevis* (Bleeker 1863; Lumbantobing and Allen 2020), and *Homalopteroides wassinkii* (Bleeker 1863; Roberts 1989; Lumbantobing 2019a). 12 fish species were not found in this study and should be present in the Surabaya River, so more extensive searches are needed in the future. However, the fact that this species can adapt to the water quality of the Surabaya River is encouraging. Currently, most of them are categorized as Least Concern (LC). Therefore, we suggest that the conservation status of these species should be reviewed. This fish is threatened by declining water quality, as it requires stable conditions and the integrity of environmental flows, while Java is one of Indonesia's most polluted islands.

Several species considered to have restricted ranges in Java, such as *H. nemurus*, *C. batrachus*, *B. binotatus*, and *D. pusilla*, were reported in this study (Ng and Low 2019; Ng 2020; Sayer 2020; Kottelat and Lim 2021). The habitat of these fish should be protected, as they are at higher risk of extinction due to their limited distribution area in Java. An example that demonstrates this urgency is the Javan native species such as *Chitala lopis*, *Hemileiocassis panjang*, *Pangio robiginosa*, *B. platysoma*, *Kryptopterus mononema*, and *Lobocheilos lehat* (Lumbantobing 2019b, 2020; Ng 2019a, 2019b; Daniels 2020; Ng 2020b), which are considered extinct globally. Furthermore, changes in river function and connectivity resulting from the construction of floodgates without fish passages, illegal mining, and deforestation have negatively impacted water quality and communities. Freshwater fish are among the species most vulnerable to global biodiversity loss because freshwater environments have limited dispersal potential. There is a significant potential for any changes to result in the loss of keystone and bioindicator species. Maintaining relevant wetland collections of these species is crucial for understanding the historical and contemporary ecological roles of the fish assemblages in the Surabaya River. Therefore, further investigation and taxonomic collection are recommended before rapid environmental change leads to more extinction events.

Threat

Another major threat to Surabaya River fish is the entry of foreign species, especially those from America and Africa. Alien species introductions as a result of aquaculture have occurred exponentially in the last five decades, disrupting the native species communities across the predation. Alien species cause negative ecological impact on native species directly through predation and indirectly through competition for resources and niches. Furthermore, the Surabaya River has multiple obstructions in the form of several large sluice gates without fishways which prevent migratory species carrying out seasonal and reproductive migrations. A similar case of sluice gate construction also occurred in the Mekong River, which crosses Thailand, Laos, Cambodia and Vietnam, causing the loss of mega aquatic fauna, such as the giant Mekong catfish *Pangasianodon gigas*, giant barb *Catlocarpio siamensis*, and the giant freshwater whipray *Urogymnus polylepis* (Hogan 2011a, 2011b; Grant et al. 2021).

Establishing a sanctuary as part of in-situ conservation is crucial to maintaining the survival of freshwater fish in the Surabaya River. In addition, ex-situ conservation through domestication is important for increasing fish populations through restocking programs. Finally, developing a periodic fisheries assessment to monitor the status of population and socio-economically important species across the Surabaya River is recommended to support the Sustainable Development Goals (SDGs) of Life Below Water and Zero Hunger (Lynch et al. 2020).

In conclusion, this study provides an updated, segment-based baseline checklist of native freshwater fishes in the Surabaya River and highlights both its remaining biodiversity value and emerging conservation priorities under strong anthropogenic pressure. Sampling across three river segments recorded 35 species (31 genera, 17 families), with Cyprinidae as the dominant family (11 species), and a clear longitudinal decline in richness from the upstream bifurcation zone (Station 1, 34 species) to the downstream end near the estuary (Station 3, 17 species). Species accumulation analyses indicated near-complete sampling (≈94% of expected richness), supporting confidence in the checklist for the surveyed period, while also implying that additional effort could still detect a small number of unrecorded taxa. The occurrence of several Javan endemic or range-restricted native species, alongside rare taxa recorded only upstream (e.g., *N. soro* and *L. hexanema*) and brackish-tolerant species confined downstream (e.g., *O. javanicus*), underscores strong environmental filtering along the river continuum and the importance of maintaining habitat quality and connectivity. Although basic water parameters were generally within suitable ranges, the manuscript emphasizes the need for expanded water-quality assessments and urgent evaluation of fishing pressure, population status, and ecological interactions—especially given barriers such as sluice gates without fishways and increasing risks from alien species introductions. Overall, the results support strengthening in-situ protection (including sanctuary effectiveness), targeted ex-situ measures (domestication/restocking where appropriate), and periodic fisheries monitoring to prevent further biodiversity loss and to inform sustainable river management in East Java.

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