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Review

Checklist of Ichthyofaunal diversity of Nagaland, India

Wewa-U • Ponglen Sukha • Kangkan Jyoti Sarma

Division of Fish & Fishery Biology, Department of Zoology, School of Biological Sciences, University of Science & Technology Meghalaya, RiBhoi, Meghalaya, India

Correspondence
Kangkan Jyoti Sarma; Division of Fish & Fishery Biology, Department of Zoology, School of Biological Sciences, University of Science & Technology Meghalaya, RiBhoi, Meghalaya, India
mailtoksarma@gmail.com

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Abstract
This study compiles a checklist to summarize findings from systematic studies and researches on the freshwater fish faunal resources including of various rivers and aquatic resources of the north eastern state of Nagaland, India utilizing multiple data sources, comprising of local scientific research surveys and specialized fishery databases. The need of such a review is of utmost importance as systematic status of many of the species has changed, and reorganization and updating of the published information has become essential for future ichthyofaunal studies in the state. The total confirmed fish species as per the scientific review of literature of the state of Nagaland consists of 216 species belonging to 29 families. The most diverse family is Cyprinidae with 89 species (41.2%), followed by Sisoridae with 23 species (10.6%), Nemacheilidae with 20 species (9.3%), Bagridae with 12 species (5.6%) while the remaining 25 families account for rest of the species in the list. This paper will help in making appropriate conservation and management planning for fisheries in all the rivers of Nagaland and would also be helpful in looking at the various degenerative reasons for population decline of fishes.

Keywords: checklist; conservation; fish diversity; freshwater ichthyofauna; Nagaland

1 | INTRODUCTION

The North East region of India is considered to be one of the major hotspots of freshwater fish biodiversity in the world (Kottelat and Whitten 1996; Ramanujam *et al.* 2010). One of the most important states of this part is Nagaland a hilly mountainous state, in the north eastern corner of the country situated between 26.1584°N, 94.5624°E, with 16,579 km^2 of total area and has many hill streams and rivers and rich exotic fish fauna. Nagaland shares its fish genetic resources with that of Indo-Gangetic plains and to a lesser extent with the Myanmar and South Chinese fauna (Bhattacharjya *et al.* 2018). A large number of fish species of the state inhabit both the lotic and lentic water bodies with climatic conditions ranging from temperate regions to lower foothill plains (Goswami *et al.* 2012). The fish resources in the lotic systems have not been completely explored because many of the rivers are located in unapproachable mountainous steep terrain with dense forest cover. The topographic and climatic diversity coupled with intriguing network of drainage systems support many commercial species. The major rivers of Nagaland and its tributaries are Doyang, Dikhu and Dhansiri flowing into the Brahmaputra River, Tizu River flows into the Chindwin river of Myanmar. The other rivers and tributary forms are Milak, Dzu, Langlong, Zungki, Likimro, Lanye, Dzuza. Manglu, Tsurong, Nanung, Tsurang, Tsumok and Menung (Bhattacharjya *et al.* 2018). One of the earliest known fishery resources studied in the state of Nagaland recorded 18 species from similar streams in the southern watershed (Chindwin drainage)

of the Naga Hills (Hora and Mukerji 1935; Hora 1936) followed by many scientific studies and surveys have been done to survey and assess various aquatic resources of Nagaland but a comprehensive report of all the species together is not available so the present review has been envisaged to enlist all of the fish fauna of Nagaland from such available works of scientific literature.

2 | METHODOLOGY

The present review is based on the available primary literature available online in the form of research articles, technical reports, technical bulletins, annual reports and books were performed using a combination of words such as "specific name of the river + fish faunal diversity, ichthyofaunal diversity, fisheries". The collected secondary data were compiled, collated and arranged to obtain fish diversity data of Nagaland. The authors also envisaged their search base through offline resources for dissertational studies but are not included for the lack of their scientific support. The prepared checklist has been prepared only on the basis of authenticated journal resources indexed in Scopus or Web of Science. With the given keywords, the search were mostly found related to the following datasets for the checklist of the fishes: Hora and Mukerji (1935); Acharjee *et al.* (2012); Goswami *et al.* (2012); Odyuo and Nagesh (2012); Imnatoshi and Ahmed (2013); Humtsoe and Bordoloi (2014); Baidya and Biswas (2018); Kumzuk (2021); Konyak (2022) and Praveenraj *et al.* (2022). We have not taken into consideration any description that has appeared in a predatory journal where the peer review has been compromised for the purposes of the current checklist (Beall 2015). Besides, for the fish classification and IUCN status, Talwar and Jhingran (1991), Jayaram (2010) and the valid nomenclature of species was adopted as per Eschmeyer's catalog of fishes (Eschmeyer *et al.* 2021) and Fishbase (Froese and Pauly 2021) has been referred and utilized.

3 | RESULTS AND DISCUSSION

This review work recorded a total of 216 species belonging to 29 families from the state of Nagaland. Cyprinidae is the highest species inhabited family comprising of 89 species followed by Sisoridae with 23, Nemacheilidae with 20, Bagridae with 12, Siluridae with 8 species (Table 1). As per the IUCN Red list category, 144 numbers of species are in the category of Least Concern, 17 into Data Deficient, 6 are in Endangered category, 28 Vulnerable, 17 in Near Threatened and 4 in Not Evaluated categories. The IUCN categorization of the fishes showing 144 species in Least Concern category clearly shows the high and pristine water quality and availability of enough food resources for the fishes. This high number can also be attributed to the geographical location of the rivers which remain scarcely inaccessible for any type of anthropogenic activities. But on the other hand, many rivers and aquatic resources in Nagaland may have been affected as their environment is threatened by habitat damage, over fishing, use of electro fishing and dynamic bombing activities (Konyak 2022). This high number can also be attributed to the geographical location of the rivers which remain scarcely inaccessible for any type of anthropogenic activities. But on the other hand, many rivers and aquatic resources in Nagaland may have been affected as their environment is threatened by habitat damage, over fishing, use of electro fishing and dynamic bombing activities (Konyak 2022). Pesticides especially organophosphate randomly used in the bank side paddy fields can affect the fish population (Acharjee *et al.* 2012). According to Kottelat and Whitten 1996), drastic reduction in abundance of the freshwater fishes in the north eastern region is due to destruction of the habitat, overexploitation and other anthropogenic effects. Frequent changes in the course of channels, bank erosion and coal mining (Semy and Singh 2021) followed by a high rate of siltation have been identified as major threats to the riverine biota (total aquatic organisms) as they have a great bearing on the faunal composition of the river. But studies performed on plankton diversity and abundance in selected rivers of Nagaland (Gurumayum *et al.* 2014) and presence of some pollution tolerant species have shown their dominance during the influx of rainwater proving the lack of impact of anthropogenic activities in major rivers of Nagaland.

TABLE 1 Annotated checklist of fishes in Nagaland state, India.

Serial	Family and scientific name	Common name	Sources	IUCN status
	Cyprinidae			
1.	*Pethia dikhuensis* Praveenraj *et al.* 2022	--	Praveenraj *et al.* 2022	NE
2.	*Labeo dero* (Hamilton, 1822)	Kursha	Odyuo and Nagesh 2012;	LC
3.	*Puntius ticto* (Hamilton, 1822)	Ticto barb	Hora and Mukerji 1935; Acharjee *et al.* 2012; Odyuo and Nagesh 2012; Humtsoe and Bordoloi 2014	LC
4.	*Tor putitora* (Hamilton, 1822)	Putitor mahseer	Goswami *et al*. 2012; Acharjee *et al.* 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Kumzuk 2021	EN

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
5.	*Amblypharyngodom mola* (Hamilton, 1822)	Mola carplet	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Baidya and Biswas 2018	LC
6.	*Bangana dero* (Hamilton, 1822)	Kalabans	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
7.	*Devario affinis* (Blyth, 1860)	NK	Baidya and Biswas 2018	DD
8.	*Devario regina* (Fowler, 1934)	Queen danio	Baidya and Biswas 2018	LC
9.	*Devario assamensis* (Barman, 1984)	NK	Baidya and Biswas 2018	VU
10.	*Salmostoma phulo* (Hamilton, 1822)	Finescale razorbelly minnow	Baidya and Biswas 2018	LC
11.	*Labeo boga* (Hamilton, 1822)	Boga	Goswami *et al*. 2012	LC
12.	*Barilius barnoides* **(**Vinciguerra, 1890)	-	Goswami *et al*. 2012	DD
13.	*Chagunius chagunio* (Hamilton, 1822)	Chaguni	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
14.	*Aspidoparia morar* (Hamilton, 1822)	Aspidoparia	Kamarkar and Das 2005; Goswami *et al.* 2012	LC
15.	*Chagunius nicholsi* (Myers, 1924)	Chagunius nicholsova	Goswami *et al*. 2012; Baidya and Biswas 2018; Kumzuk 2021	LC
16.	*Chela cachius* (Hamilton, 1822)	Silver hatchet chela	Goswami *et al.* 2012	LC
17.	*Chela laubuca* (Hamilton, 1822)	Blue laubuca	Goswami *et al*. 2012	NT
18.	*Ctenopharyngodon idella* (Valenciennes, 1844)	Grass carp	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
19.	*Cirrhinus mrigala* (Hamilton, 1822)	White carp	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
20.	*Cirrhinus reba* (Hamilton, 1822)	Reba carp	Goswami *et al*. 2012	LC
21.	*Crossocheilus burmanicus* Hora, 1936	Burmese latia	Goswami *et al*. 2012; Baidya and Biswas 2018; Kumzuk 2021	LC
22.	*Crossocheilus latius* (Hamilton, 1822)	Gangetic latia	Hora and Mukerji 1935; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
23.	*Cyprinion semiplotum* (McClelland, 1839)	Assamese king fish	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	VU
24.	*Cyprinus carpio* Linnaeus, 1758	Common carp	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	VU
25.	*Barilius barila* (Hamilton, 1822)	Barred baril	Hora and Mukerji 1935; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018; Kumzuk 2021	LC
26.	*Barilius vagra* (Hamilton, 1822)	Korang	Goswami *et al.* 2012; Kumzuk 2021	LC
27.	*Barilius clavatus* (Hamilton, 1822)	NK	Hora and Mukerji 1935	NE
28.	*Labeo angra* (Hamilton, 1822)	Angra labeo	Kamarkar and Das 2005; Goswami *et al*. 2012	LC
29.	*Labeo bata* (Hamilton, 1822)	Minor carp	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
30.	*Labeo ariza* (Hamilton, 1807)	Reba	Goswami *et al*. 2012	VU
31.	*Labeo calbasu* (Hamilton, 1822)	Kalbasu	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
32.	*Gibelion catla* (Hamilton, 1822)	Catla	Goswami *et al*. 2012; Kumzuk 2021	LC

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
33.	*Labeo dyocheilus* (McClelland, 1839)	Ghora loach	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
34.	*Labeo fimbriatus* (Bloch, 1795)	Fringed lipped carp	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	LC
35.	*Labeo gonius* (Hamilton, 1822)	Kuria labeo	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
36.	*Labeo pangusia* (Hamilton, 1822)	Pangusia labeo	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	NT
37.	*Labeo rohita* (Hamilton, 1822)	Rohu fish	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
38.	*Esomus danricus* (Hamilton, 1822)	Indian flying barb	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Baidya and Biswas 2018; Kumzuk 2021	LC
39.	*Danio dangila* (Hamilton, 1822)	Dangila danio	Hora and Mukerji 1935; Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Kumzuk 2021	LC
40.	*Danio rerio* (Hamilton, 1822)	Zebra fish	Goswami *et al*. 2012; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018	LC
41.	*Devario acuticephala* (Hora, 1921)	Manipur danio	Hora and Mukerji 1935; Goswami *et al*. 2012	VU
42.	*Devario aequipinnatus* (McClelland, 1839)	Giant danio	Hora and Mukerji 1935; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018; Kumzuk 2021	LC
43.	*Devario devario* (Hamilton, 1822)	Bengal danio	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
44.	*Devario naganensis* (Chaudhuri, 1912)	NK	Hora and Mukerji 1935; Goswami *et al*. 2012; Kumzuk 2021	VU
45.	*Hypophthalmichthys molitrix* **(**Valenciennes, 1844**)**	Silver carp	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	NT
46.	*Hypophthalmichthys nobilis* (Richardson, 1845)	Bighead carp	Goswami *et al*. 2012	DD
47.	*Garra rupecula* (McClelland, 1839)	Mishmi garra	Hora and Mukerji 1935; Goswami *et al*. 2012	NT
48.	*Garra lamta* (Hamilton, 1822)	Lamta garra	Goswami *et al*. 2012	VU
49.	*Garra kempi* Hora, 1921	Kemp garra	Hora and Mukerji 1935; Goswami *et al*. 2012; Humtsoe and Bordoloi 2014	LC
50.	*Garra notata* (Blyth, 1860)	Tenasserim garra	Goswami *et al*. 2012	LC
51.	*Garra mcclellandi* (Jerdon, 1849)	Cauvery garra	Goswami *et al.* 2012; Baidya and Biswas 2018; Kumzuk 2021	LC
52.	*Oreinus molesworthi* (Chaudhuri, 1913)	Blunt-nosed snowtrout	Hora and Mukerji 1935	DD
53.	*Garra lissorhynchus* (McClelland, 1842)	Khasi garra	Hora and Mukerji 1935; Goswami *et al*., 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Kumzuk 2021	LC
54.	*Garra naganenesis* Hora, 1921	Naga garra	Hora and Mukerji 1935; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013	LC
55.	*Garra nasuta* (McClelland, 1838)	Khasi garra	Goswami *et al*. 2012	LC
56.	*Garra gotyla* Gray, 1830)	Gotyla	Acharjee *et al.* 2012; Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
57.	*Garra annandalei* Hora, 1921	Annandala garra	Goswami *et al*. 2012	LC
58.	*Garra gravelyi* (Annandale, 1919)	Burmese garra	Imnatoshi and Ahmed 2013	NT
59.	*Raiamas bola* (Hamilton, 1822)	Trout barb	Goswami *et al*. 2012	VU
60.	*Salmostoma bacaila* (Hamilton, 1822)	Large razor-belly minnow	Goswami *et al*. 2012	LC
61.	*Salmostoma acinaces* (Valenciennes, 1844)	Silver razor-belly minnow	Goswami *et al*. 2012	LC
62.	*Schizothorax richardsonii* (Gray, 1832)	Snowtrout	Goswami *et al*. 2012; Kumzuk 2021	VU
63.	*Systomus sarana* (Hamilton, 1822)	Olive barb	Kumzuk *et al.* 2019	LC
64.	*Osteobrama cotio* (Hamilton, 1822	Cotio Hafua	Goswami *et al*. 2012	NT
65.	*Puntius chola* (Hamilton, 1822)	Swamp barb	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
66.	*Puntius terio* (Hamilton, 1822)	Onespot barb	Goswami *et al*. 2012	LC
67.	*Puntius sophore* (Hamilton, 1822)	Pool barb	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018; Kumzuk 2021	LC
68.	*Pethia conchonius* (Hamilton, 1822)	Rosy barb	Hora and Mukerji 1935; Acharjee *et al.* 2012; Goswami *et al*. 2012; Baidya and Biswas 2018	LC
69.	*Puntius sarana* (Hamilton, 1822)	Olive barb	Goswami *et al*. 2012	VU
70.	*Pethia ticto* (Hamilton, 1822)	Ticto barb	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
71.	*Puntius shalynius* (Hamilton, 1822)	Shalyni barb	Goswami *et al*. 2012	VU
72.	*Poropuntius clavatus* (McClelland, 1845)	Stedman barb	Hora and Mukerji 1935; Goswami *et al*. 2012	NT
73.	*Rasbora daniconius* (Hamilton, 1822)	Slender rasbora	Goswami *et al*. 2012	LC
74.	*Raiamas guttatus* (Day, 1870)	Burmese trout	Goswami *et al*. 2012	LC
75.	*Rasbora rasbora* (Hamilton, 1822)	Seluang fish	Hora and Mukerji 1935; Goswami *et al*. 2012	LC
76.	*Neolissochilus hexagonolepis* (McClelland, 1839)	Chocolate mahseer	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	NT
77.	*Neolissochilus hexastichus* (McClelland, 1839)	McCleland's Bokar	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	NT
78.	*Dawkinsia filamentosa* (Valenciennes, 1844)	Blackspot barb	Goswami *et al*. 2012	VU
79.	*Tor progeneius* (McClelland, 1839)	Jungha pithia	Goswami *et al*. 2012; Odyuo and Nagesh 2012	EN
80.	*Tor chelynoides* (McClelland, 1839)	Dark masheer	Goswami *et al*. 2012	VU
81.	*Tor tor* (Hamilton, 1822)	Mahseer	Hora and Mukerji 1935; Goswami *et al*., 2012; Odyuo and Nagesh 2012; Acharjee *et al.,*2012; Kumzuk 2021	DD
82.	*Labeo catla* (Hamilton, 1822)	Catla	Acharjee *et al.* 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013	LC

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
83.	*Barilius barna* (Hamilton, 1822)	Barna baril	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018; Kumzuk 2021	LC
84.	*Barilius tileo* (Hamilton, 1822)	Tileo baril	Kamarkar and Das 2005; Goswami *et al*. 2012; Odyuo and Nagesh 2012	LC
85.	*Barilius bendelisis* (Hamilton, 1807)	Hamliton's baril	Hora and Mukerji 1935; Goswami *et al.* 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Baidya and Biswas 2018; Kumzuk 2021	LC
86.	*Barilius dogarsinghi* (Hora, 1921)	Manipur baril	Hora and Mukerji 1935; Kamarkar and Das 2005; Goswami *et al*. 2012	VU
87.	*Barilius shacra* (Hamilton, 1822)	Shacra baril	Goswami *et al*. 2012	LC
88.	*Cyprinus carpio specularis* Linnaeus, 1758	Eurasian carp	Odyuo and Nagesh 2012	VU
89.	*Cyprinus carpio communis* Linnaeus, 1758	Eurasian carp	Odyuo and Nagesh 2012	VU
	Balitoridae			
90.	*Balitora brucei* Gray, 1830	Gray's stone loach	Goswami *et al*. 2012	NT
91.	*Balitora burmanica* Hora, 1932	Burmese stone loach	Goswami *et al*. 2012; Odyuo and Nagesh 2012	LC
	Nemacheilidae			
92.	*Homalopteroides rupicola* (Prashad & Mukerji, 1929)	Balitora skaliskova	Goswami *et al*. 2012	LC
93.	*Schistura corica* (Hamilton, 1822)	Polka dotted Bengal loach	Baidya and Biswas 2018	LC
94.	*Schistura beavani* (Günther, 1868)	Creek loach	Goswami *et al*. 2012; Baidya and Biswas 2018	LC
95.	*Schistura kangjupkhulensis* (Hora, 1921)	Stone loaches	Hora and Mukerji 1935; Kamarkar and Das 2005	EN
96.	*Schistura manipurensis* (Chaudhuri, 1912)	Manipur loach	Hora and Mukerji 1935; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Humtsoe and Bordoloi 2014; Kumzuk 2021	NT
97.	*Schistura multifasciatus* (Day, 1878)	Stone loach	Baidya and Biswas 2018; Kumzuk 2021	LC
98.	*Schistura nagaensis* (Menon, 1987)	Naga käärtrull	Goswami *et al*. 2012	VU
99.	*Schistura savona* (Hamilton, 1822)	Half banded loach	Goswami *et al*. 2012	LC
100.	*Schistura scaturigina* McClelland, 1839	McClelland loach	Goswami *et al*. 2012	LC
101.	*Schistura sikmaiensis* (Hora, 1921)	Sikmai loach	Hora and Mukerji 1935; Goswami *et al*. 2012	LC
102.	*Schistura prashadi* (Hora, 1921)	Mustura prashadi	Hora and Mukerji 1935; Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	VU
103.	*Schistura rupicula* McClelland, 1838	Stone loach	Hora and Mukerji 1935	LC
104.	*Schistura reticulofasciata* (Singh & Bănărescu, 1982)	Stone loach	Kumzuk 2021	VU
105.	*Schistura vinciguerrae* (Hora, 1935)	Stone loach	Goswami *et al*. 2012; Humtsoe and Bordoloi 2014	LC
106.	*Schistura sijuensis* (Menon, 1987)	Stone loach	Goswami *et al*. 2012	EN
107.	*Nemacheilus botia* (Hamilton, 1822)	Mottled loach	Hora and Mukerji 1935, Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Baidya and Biswas 2018	LC
108.	*Schistura singhi* Menon, 1987	Stone loach	Goswami *et al*. 2012	VU

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
109.	*Paracanthocobitis zonalternans* (Blyth, 1860)	Dwarf zipper loach	Hora and Mukerji 1935; Goswami *et al*. 2012	LC
110.	*Schistura subfusca* (McClelland, 1839)	–	Hora and Mukerji 1935	LC
111.	*Neonoemacheilus assamensis* (Menon, 1987)	–	Imnatoshi and Ahmed 2013	NT
	Botiidae			
112.	*Botia almorhae* Gray, 1831	Tiger loach	Goswami *et al*. 2012	LC
113.	*Botia dario* (Hamilton, 1822)	Bengal loach	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
114.	*Botia histrionica* Blyth, 1860	Golden zebra loach	Goswami *et al*. 2012	LC
115.	*Botia rostrata* Günther, 1868	Gangetic loach	Goswami *et al*. 2012	VU
	Cobitidae			
116.	*Lepidocephalichthys annandalei* Chaudhuri, 1912	Tilak loach	Goswami *et al*. 2012	LC
117.	*Lepidocephalichthys berdmorei* (Blyth, 1860)	Burmese loach	Hora and Mukerji 1935; Goswami *et al*. 2012; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018; Kumzuk 2021	LC
118.	*Lepidocephalichthys guntea* (Hamilton, 1822)	Guntea loach	Hora and Mukerji 1935; Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014	LC
119.	*Lepidocephalichthys irrorata* Hora, 1921	Loktak loach	Goswami *et al*. 2012	LC
120.	*Canthophrys gongota* (Hamilton, 1822)	Gongota loach	Goswami *et al*. 2012; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018	LC
121.	*Pangio pangia* (Hamilton, 1822)	Cinnamon loach	Hora and Mukerji 1935; Goswami *et al*. 2012; Baidya and Biswas 2018	LC
	Psilorhynchidae			
122.	*Psilorhynchus balitora* (Hamilton, 1822)	Torrent stone carp	Goswami *et al*. 2012; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018	LC
123.	*Psilorhynchus homaloptera* Hora & Mukerji, 1935	Homaloptera minnow	Hora and Mukerji 1935; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Kumzuk 2021	LC
124.	*Psilorhynchus sucatio* (Hamilton, 1822)	River stone carp	Goswami *et al*. 2012; Humtsoe and Bordoloi 2014	LC
	Sisoridae			
125.	*Gagata cenia* (Hamilton, 1822)	Indian gagata	Goswami *et al*. 2012	LC
126.	*Glyptothorax cavia* (Hamilton, 1822)	Heart throat catfish	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	LC
127.	*Glyptothorax coheni* (Jenkins, 1910)	–	Goswami *et al*. 2012	LC
128.	*Glyptothorax dorsalis* Vinciguerra, 1890	–	Baidya and Biswas 2018	LC
129.	*Glyptothorax indicus* Talwar, 1991	Catfish	Goswami *et al*. 2012	LC
130.	*Glyptothorax manipurensis* (Menon, 1955)	–	Goswami *et al*. 2012	VU
131.	*Glyptothorax ngapang* Vishwanath & Linthoingambi, 2007	–	Baidya and Biswas 2018	LC
132.	*Glyptothorax platypogonides* (Bleeker, 1855)	–	Goswami *et al*. 2012	LC
133.	*Glyptothorax saisii* (Jenkins, 1910)	–	Goswami *et al*. 2012	VU
134.	*Glyptothorax siamensis* Hora, 1923	–	Baidya and Biswas 2018	DD

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
135.	*Glyptothorax sinensis* (Regan, 1908)	–	Goswami *et al*. 2012	DD
136.	*Glyptothorax telchitta* (Hamilton, 1822)	Pahari tellah	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Baidya and Biswas 2018; Kumzuk 2021	LC
137.	*Glyptothorax trilineatus* Blyth, 1860	Three-lined catfish	Goswami *et al*. 2012; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018; Kumzuk 2021	LC
138.	*Exostoma berdmorei* Blyth, 1860	–	Goswami *et al*. 2012	DD
139.	*Exostoma labiatum* (McClelland, 1842)	Burmese bat catfish	Hora and Mukerji 1935; Goswami *et al*. 2012; Humtsoe and Bordoloi 2014	LC
140.	*Exostoma stuarti* (Hora, 1923)	–	Goswami *et al*. 2012	DD
141.	*Exostoma vinciguerrae* Regan, 1905	–	Goswami *et al*. 2012	DD
142.	*Bagarius yarrelli* (Hamilton, 1822)	Goonch	Goswami *et al*. 2012; Odyuo and Nagesh 2012	VU
143.	*Myersglanis jayarami* Vishwanath & Kosygin, 1999	–	Goswami *et al*. 2012	VU
144.	*Nangra nangra* (Hamilton, 1822)	Kosi nangra	Goswami *et al*. 2012	LC
145.	*Pseudecheneis sulcata* (McClelland, 1842)	Suker throat catfish	Goswami *et al*. 2012; Baidya and Biswas 2018	LC
146.	*Sisor rabdophorus* Hamilton, 1822	Whip tailed catfish	Goswami *et al*. 2012	LC
147.	*Pseudecheneis nagalandensis* Shangningam & Kosygin, 2020	–	Shangningam and Kosygin 2020	NE
	Bagridae			
148.	*Mystus armatus* (Day, 1865)	Kerala mystus	Goswami *et al*. 2012	LC
149.	*Mystus bleekeri* (Day, 1877)	Day's mystus	Hora and Mukerji 1935; Goswami *et al*. 2012	LC
150.	*Mystus cavasius* (Hamilton, 1822)	Gangatic mystus	Acharjee *et al.* 2012; Goswami *et al*. 2012	LC
151.	*Mystus tengara* (Hamilton, 1822)	Tengara catfish	Acharjee *et al.* 2012; Goswami *et al*. 2012	LC
152.	*Mystus vittatus* (Bloch, 1794)	Striped dwarf catfish	Acharjee *et al.* 2012; Goswami *et al*. 2012	LC
153.	*Mystus ngasep* Darshan, Vishwanath, Mahanta & Barat, 2011	–	Baidya and Biswas 2018	NE
154.	*Olyra burmanica* Day, 1872	Longtail catfish	Goswami *et al*. 2012	DD
155.	*Olyra horae* (Prashad & Mukerji, 1929)	Hora olyra	Goswami *et al*. 2012	DD
156.	*Olyra kempi* Chaudhuri, 1912	Kempi olyra	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	LC
157.	*Olyra longicaudata* McClelland, 1842	Himalayan olyra	Goswami *et al*. 2012; Baidya and Biswas 2018; Kumzuk 2021	LC
158.	*Sperata aor* (Hamilton, 1822)	Long-whiskered catfish	Goswami *et al*. 2012; Odyuo and Nagesh 2012	LC
159.	*Sperata seenghala* (Sykes, 1839)	Giant river catfish	Kamarkar and Das 2005; Goswami *et al*., 2012; Odyuo and Nagesh 2012	LC
	Siluridae			
160.	*Pterocryptis berdmorei* (Blyth, 1860)	Burmese silurus	Goswami *et al*. 2012; Kumzuk 2021	LC
161.	*Pterocryptis gangelica* Peters, 1861	Afghanistan silurus	Kumzuk 2021	DD

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
162.	*Pterocryptis indicus* (Datta, Barman & ayaram, 1987)	Siluras catfish	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	DD
163.	*Pterocryptis afghana* (Günther, 1864)	–	Goswami *et al*. 2012	LC
164.	*Ompok bimaculatus* (Bloch, 1794)	Butter catfish	Hora and Mukerji 1935; Goswami *et al*. 2012; Kumzuk 2021	NT
165.	*Ompok pabda* (Hamilton, 1822)	Pabdah catfish	Acharjee *et al.* 2012; Goswami *et al*. 2012	NT
166.	*Ompok pabo* (Hamilton, 1822)	Pabo catfish	Kumzuk 2021	NT
167.	*Wallago attu* (Bloch & Schneider, 1801)	Wallago	Acharjee *et al.* 2012; Goswami *et al*. 2012	VU
	Erethistidae			
168.	*Erethistes hara* (Hamilton, 1822)	Moth catfish	Hora and Mukerji 1935; Goswami *et al*. 2012	LC
169.	*Erethistes horai* Misra, 1976	Elongated moth catfish	Goswami *et al*. 2012	LC
170.	*Erethistes jerdoni* Day, 1870	Sylhet hara	Goswami *et al*. 2012	LC
171.	*Erethistes pusillus* Müller & Troschel, 1849	Gaint moth catfish	Goswami *et al*. 2012	LC
172.	*Conta conta* (Hamilton, 1822)	Conta catfish	Hora and Mukerji 1935; Goswami *et al*. 2012	DD
	Schilbeidae			
173.	*Ailia coila* (Hamilton, 1822)	Gangetic ailia	Acharjee *et al.* 2012	NT
174.	*Clupisoma garua* (Hamilton, 1822)	Garua Bachcha	Goswami *et al*. 2012; Odyuo and Nagesh 2012	LC
175.	*Eutropiichthys vacha* (Hamilton, 1822)	Batchwa vacha	Goswami *et al*. 2012	LC
176.	*Eutropiichthys murius* (Hamilton, 1822)	Murius vacha	Goswami *et al*. 2012	LC
	Clariidae			
177.	*Clarias batrachus* (Linnaeus, 1758)	Walking catfish	Odyuo and Nagesh 2012; Acharjee *et al.* 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
178.	*Clarias magur* (Hamilton, 1822)	Magur	Goswami *et al*. 2012	EN
179.	*Clarias gariepinus* (Burchell, 1822)	North African catfish	Goswami *et al*. 2012; Odyuo and Nagesh 2012	LC
	Heteropneustidae			
180.	*Heteropneustes fossilis* (Bloch, 1794)	Stinging catfish	Goswami *et al*. 2012; Kumzuk 2021	LC
	Amblycipitidae			
181.	*Amblyceps apangi* Nath & Dey, 1989	Torrential cat fish	Acharjee *et al.* 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014	LC
182.	*Amblyceps arunachalensis* Nath & Dey, 1989	–	Humtsoe and Bordoloi 2014	EN
183.	*Amblyceps mangois* (Hamilton, 1822)	Indian torrents catfish	Hora and Mukerji 1935; Goswami *et al*. 2012	LC
	Channidae			
184.	*Channa barca* (Hamilton, 1822)	Barca snake head	Acharjee *et al.* 2012; Goswami *et al*. 2012	DD
185.	*Channa gachua* (Hamilton, 1822)	Dhok	Hora and Mukerji 1935; Humtsoe and Bordoloi 2014	LC
186.	*Channa marulius* (Hamilton, 1822)	Giant snakehead	Goswami *et al*. 2012	LC

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
187.	*Channa punctatus* (Bloch, 1793)	Spotted snakehead	Hora and Mukerji 1935; Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Kumzuk 2021	LC
188.	*Channa stewartii* (Playfair, 1867)	Assamese Snakehead	Goswami *et al*. 2012; Humtsoe and Bordoloi 2014; Baidya and Biswas 2018; Kumzuk 2021	LC
189.	*Channa striata* (Bloch, 1793)	Snakehead murrel	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
190.	*Channa orientalis* Bloch & Schneider, 1801	Asiatic snakehead	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	VU
	Mastacembelidae			
191.	*Mastacembulus armatus* (Lacepède, 1800)	Zig zag eel	Acharjee *et al.* 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Baidya and Biswas 2018; Kumzuk 2021	LC
192.	*Macrognathus aral* (Bloch & Schneider, 1801)	Spiny eel	Goswami *et al*. 2012	LC
193.	*Macrognathus pancalus* Hamilton, 1822	Striped spiny eel	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Kumzuk 2021	LC
	Ambassidae			
194.	*Chanda nama* Hamilton, 1822	Elongate glassy perchlet	Acharjee *et al.* 2012; Goswami *et al*. 2012	LC
195.	*Parambassis baculis* (Hamilton, 1822)	Himalayan glassy perchlet	Goswami *et al*. 2012	LC
196.	*Parambassis ranga* (Hamilton, 1822)	Indian glassy fish	Goswami *et al*. 2012	LC
	Osphronemidae			
197.	*Trichogaster chuna* (Hamilton, 1822)	Honey gourami	Goswami *et al*. 2012	LC
198.	*Trichogaster fasciatus* Bloch & Schneider, 1801	Banded gourami	Acharjee *et al.* 2012; Goswami *et al*. 2012	LC
199.	*Trichogaster lalius* (Hamilton, 1822)	Dwarf gourami	Goswami *et al*. 2012	LC
200.	*Osphronemus goramy* Lacepède, 1801	gourami	Goswami *et al*. 2012	LC
201.	*Macropodus cupanus* (Cuvier, 1831)	Spiketail paradisefish	Goswami *et al*. 2012	LC
	Notopteridae			
202.	*Notopterus Notopterus* (Pallas, 1769)	Bronze featherback	Acharjee *et al.* 2012; Odyuo and Nagesh 2012	LC
	Anguillidae			
203.	*Anguilla bengalensis* (Gray, 1831)	Indian mottled eel	Odyuo and Nagesh 2012; Kumzuk 2021	NT
	Belonidae			
204.	*Xenentodon cancila* (Hamilton, 1822)	Freshwater gar fish	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
205.	*Strongylura strongylura* (van Hasselt, 1823)	Gar fish	Goswami *et al*. 2012	LC

TABLE 1 Continued.

Serial	Family and scientific name	Common name	Sources	IUCN status
	Synbranchidae			
206.	*Monopterus albus* (Zuiew, 1793)	Rice swamp eel	Goswami *et al*. 2012; Imnatoshi and Ahmed 2013	LC
207.	*Monopterus cuchia* (Hamilton, 1822)	Cuchia	Acharjee *et al.,*2012; Goswami *et al*., 2012	LC
	Nandidae			
208.	*Nandus nandus* (Hamilton, 1822)	Beda	Goswami *et al*. 2012	LC
	Anabantidae			
209.	*Anabas testudineus* (Bloch, 1792)	Climbing perch	Goswami *et al*. 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Kumzuk 2021	LC
210.	*Anabas cobojius* (Hamilton, 1822)	Gangetic koi	Goswami *et al*. 2012	DD
	Badidae			
211.	*Badis badis* (Hamilton, 1822)	Dwarf chameleon fish	Hora and Mukerji 1935; Goswami *et al*., 2012; Odyuo and Nagesh 2012; Imnatoshi and Ahmed 2013; Humtsoe and Bordoloi 2014; Kumzuk 2021	LC
	Cichlidae			
212.	*Oreochromis mossammbicus* (Peters, 1852)	Mozambique tilapia	Odyuo and Nagesh 2012; Kumzuk 2021	VU
213.	*Oreochromis niloticus* (Linnaeus, 1758)	Tilapia	Goswami *et al*. 2012	LC
	Gobidae			
214.	*Glossogobius giuris* (Hamilton, 1822)	Tank goby	Acharjee *et al*. 2012; Goswami *et al*. 2012; Odyuo and Nagesh 2012;	LC
	Scianenidae			
215.	*Johnius coitor* (Hamilton, 1822)	Coitor croaker	Goswami *et al*. 2012	LC
	Mugilidae			
216.	*Rhinomugil corsula* (Hamilton, 1822)	Corsula mullet	Goswami *et al*. 2012	LC

IUCN Red List categories: DD, Data Deficient; EN, Endangered; LC, Least Concern; NE, Not Evaluated; NT, Not Threatened; VU, Vulnerable.

4 | CONCLUSIONS

This review presents the ichthyofaunal diversity of Nagaland state, India. As a measure of maintaining and conserving the ecosystem health and an understanding of the dynamics of fish biodiversity in response to various natural or man-made stressors, fish diversity must be regularly documented. Plans should be made for future research that focus on the major rivers of the state, preferably using a broader approach with respect to physico-chemical quality of water and fish diversity, in order to build a solid database for the species conservation.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

AUTHORS' CONTRIBUTION

WU and PS did the secondary survey, collected and analyzed the data and prepared the draft manuscript. KJS conceptualized and designed the study, supervised the work and finalized the manuscript.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available within the article.

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Wewa-U http://orcid.org/0009-0009-9021-4814
P Sukha https://orcid.org/0009-0002-2956-7310
KJ Sarma https://orcid.org/0000-0002-5073-2539