



An Inventory of Ichthyofauna of Kolhapur District

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Abstract

There is need of comprehensive systematic updated inventory of fishes available in Kolhapur district for sustainable development of fisheries, aquaculture and ornamental fish industry and more importantly for conservation purpose. Hence, an attempt was made in the present study to provide an inventory of ichthyofauna of Kolhapur district. A systematic and comprehensive review of available literature was made along with collections made by authors and specimens available at Zoological Survey of India, Pune to carry out the Meta-analysis of all the published (both peer reviewed and non-peer reviewed) literature and collections. The present inventory comprises of total 110 fish species belonging to 10 orders, 27 families and 62 from Kolhapur district. Cypriniformes is the dominant order represented by 69 species, followed by Siluriformes (22 species), Anabantiformes (5 species), Cyprinodontiformes and Synbranchiformes (3 species each). While Belontiiformes, Cichliformes and Mugiliformes were represented by two species each, Anguilliformes and Gobiiformes were represented by one species each. A list of further 19 species earlier recorded in literature with explanation for its deletion is provided. As per the IUCN Red list of Threatened Species, Sixty six species assessed as Least Concern, whereas Five species assessed as Data Deficient, Six species as Near Threatened, Eight as Vulnerable and Nine as Endangered (IUCN 2024). Three Species were Not Evaluated, Three Transplanted and Ten Exotic species. The present work will form a baseline for future studies.

Keywords:

Kolhapur district, Ichthyofauna, Panchganga

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Introduction

India possesses maximum number of endemic freshwater fishes (De Silva *et al.*, 2007); comprising 397 species (Mishra *et al.*, 2013). With high level of endemism in North East India and Western Ghats, comprising 152 and 149 species respectively (Mishra *et al.* 2013). Molur *et al.* (2011), reported 189 endemic freshwater fish species from Western Ghats assessment region (including Western Ghats and associated river basins; Narmada, Tapi, Godavari, Krishna, Cauvery and all other river systems in southern India). The Western Ghats of India show unique and phylogenetically-diverse, endemic and exotic fish diversity, contributing a total of 355 freshwater fish species (Sajan, 2015).

The Kolhapur district is located in the Southern part of Maharashtra State between 15° 43' and 17° 17' North latitudes and 73° 40' and 74° 42' East longitudes lies in the Northern parts of Western Ghats. Tributaries of Krishna River originate west of the Sahyadri ranges in the district and drain north-eastwardly. The important rivers in the district are Warna, Panchganga, Dudhganga, Vedhganga, Hiranyakeshi and Ghatprabha (Kalwar & Kelkar, 1956). Due to lack of extensive taxonomic work the northern Western Ghats were known to be species

poor (Kumar et al., 2021) and the same is true for the waters of Kolhapur district.

The first gazetteer of Kolhapur district published by Campbell 1886 mentions only local name of fishes, later Kulkarni (1951) described three new species and Kulkarni, 1952 again described a new species and genus of Schilbeid catfish *Neotroplus khavalchor* from Krishna River near Islampur, District Satara, and Panchaganga river near Kolhapur then Bombay State (Kulkarni, 1952). The first account on fishes of Kolhapur was given by Kalwar & Kelkar (1956) reporting 72 species and then by Gazetteer of the Kolhapur Distri (1960) reporting 67 species. Pawar, 1986 reported 48 species from river Panchganga. To the best of our knowledge for almost 25 years there is no literature available during the period 1989 – 2011. Karmakar et al. (2012) reported 33 species and Mohite and Samant (2013) reported 42 species from Warana river basin, Jadhav & Jadhav (2014) reported 20 species from Radhanagari Wildlife Sanctuary, Tejas et al. (2015) reported 23 species from different rivers in Kolhapur district, Kumkar et al. (2017), reported 57 species from Hiranyakeshi river in southern parts of Kolhapur district.

In addition to this confirmation of distributional records of species like *Balitora laticauda* (Bhoite, Jadhav & Dahanukar, 2012; Kumkar et al., 2016) and range extension of *Clarias dussumieri* and newly described species *Oreochthys duospilus* (Kumkar et al., 2017) along with validation of existence of *Pterocryptis wyanaadensis* described by Arunachalam et al. (2000) was made in recent studies. New species discoveries like *Pethia longicauda* (Katwate, et al., 2014), *Pethia sahit* (Katwate et al., 2018) and *Schistura hiranyakeshi* (Praveenraj et al. 2020),

Indoreonectes rajeevi (Kumka et al., 2021) further justifies need of more taxonomic studies in this region as pointed by Kumar et al. (2017).

Review of literature reveals that the five interacting freshwater biodiversity threat categories, viz: invasion by exotic species; overexploitation; water pollution; flow modification; destruction or degradation of habitat; and (Dudgeon et al., 2006), with more or less varying severity are observed in the freshwaters systems of the Maharashtra state (Molur et al., 2011). Kumkar et al. (2017) reported the same from Hiranyakeshi river.

In addition to this, invalid specific names are also considered valid and few specific names are not accepted scientifically as they are described without following codes and hence constitute 'nomina nuda' are still in use (Dahanukar et al., 2004; Molur et al., 2011; Patil et al., 2018) further the species with no geographical distributional range are also sometimes enlisted in earlier works. Hence, there is need of comprehensive systematic updated inventory of fishes available in Kolhapur district for development of Fisheries sector, Aquaculture and Ornamental fish industry and more importantly for conservation purpose. In the present study an attempt is made, to make an inventory of ichthyofauna of Kolhapur district.

Material and Methods

To prepare the present inventory on ichthyofauna of Kolhapur district (Fig. 1), we carried out a comprehensive review of available literature during years 1866–2023 (Campbel, 1866; Kulkarni, 1951; Kulkarni, 1952; Kalwar & Kelkar, 1956; Pathak, 1960; Pawar, 1986; Karmakar et. al., 2012; Mohite and

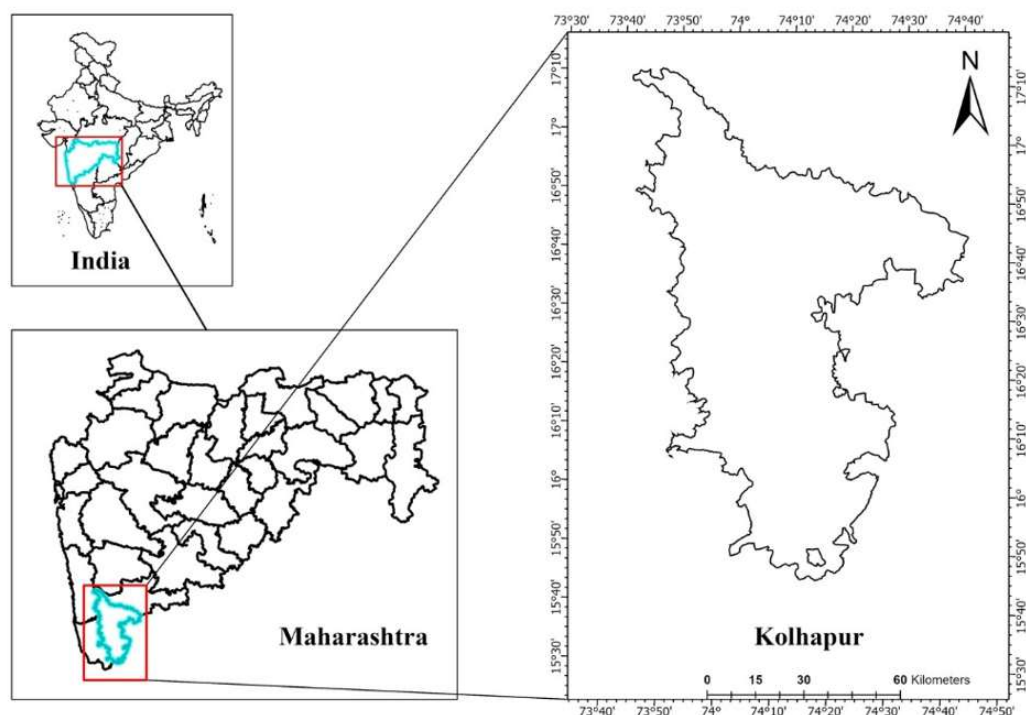


Fig. 1 Kolhapur District

Samant, 2013; Jadhav and Jadhav 2014; Tejas et al., 2015; Kumkar et al., 2017) along with collections made by authors and available at Zoological Survey of India, Pune. Further Meta-analysis of all the published (both peer reviewed and non-peer reviewed) literature was carried out. Systematic revision of the taxonomic status was made as per the nomenclature for Family, Generic and Species name based on Van der Laan & Fricke (2024) and Fricke et al., (2024). Further, according to Van der Laan et al., (2024) the classification was revised. The threat status and distributional range of the fish species was checked as per IUCN (2024). The threat status of transplanted and exotic species is not provided. A discussion on the taxa earlier recorded in literature with explanation for its deletion is provided in order to avoid repetition.

Results and Discussion

About 110 fish species belonging to 10 orders 27 families and 62 genera from Kolhapur district (Table 1). Cypriniformes is the dominant order represented by 69 species, followed by Siluriformes (22 species), Anabantiformes (5 species), Cyprinodontiformes and Synbranchiformes (3 species each). While Belontiiformes, Cichliformes and Mugiliformes were represented by two species each, Anguilliformes and Gobiiformes were represented by one species each.

Table 1: List of ichthyofauna having distributional range in Kolhapur district

Order, Family, Species	IUCN Status
Order: Anguilliformes	
Family: Anguillidae	
1 <i>Anguilla bengalensis</i> (Gray 1831)	NT
Order: Cypriniformes	
Family: Botiidae	
2 <i>Botia striata</i> Narayan Rao, 1920	EN
Family: Cobitidae	
3 <i>Lepidocephalichthys thermalis</i> (Valenciennes, 1846)	LC
Family: Balitoridae	
4 <i>Balitora laticauda</i> Bhoite, Jadhav & Dahanukar, 2012	LC
Family: Nemacheilidae	
5 <i>Indoreonectes evezardi</i> (Day, 1872)	LC
6 <i>Indoreonectes rajeevi</i> Pradeep Kumkar, Manoj Pise ¹ , Pankaj A. Gorule, Chandani R. Verma and Lukáš Kalous, 2021	NE
7 <i>Nemacheilus anguilla</i> Annandale, 1919	LC
8 <i>Nemachilichthys ruppelli</i> (Sykes 1839)	LC
9 <i>Paracanthocobitis botia</i> (Hamilton, 1822)	LC
10 <i>Paracanthocobitis mooreh</i> (Sykes, 1839)	LC
11 <i>Schistura denisoni</i> (Day 1867)	LC
12 <i>Schistura hiranyakeshi</i> Praveenraj,	NE
Thackeray & Balasubramanian 2020	
Family: Cyprinidae	
13 <i>Bangana nukta</i> (Sykes 1839)	EN
14 <i>Cirrhinus mrigala</i> (Hamilton, 1822)	T
15 <i>Cirrhinus reba</i> (Hamilton, 1822)	LC
16 <i>Cyprinus carpio</i> Linnaeus, 1758	Ext
17 <i>Garra bicornuta</i> Narayan Rao, 1920	NT
18 <i>Garra gotyla</i> (Gray, 1830)	LC
19 <i>Garra mullya</i> (Sykes, 1839)	LC
20 <i>Gymnostomus ariza</i> (Hamilton 1807)	LC
21 <i>Gymnostomus fulungee</i> (Sykes 1839)	LC
22 <i>Hypselobarbus carnaticus</i> (Jerdon, 1849)	LC
23 <i>Hypselobarbus curmuca</i> (Hamilton, 1807)	EN
24 <i>Hypselobarbus dobsoni</i> (Day 1876)	DD
25 <i>Hypselobarbus jerdoni</i> (Day, 1870)	LC
26 <i>Hypselobarbus kolus</i> (Sykes, 1839)	VU
27 <i>Hypselobarbus mussullah</i> (Sykes, 1839)	EN
28 <i>Labeo bata</i> (Hamilton, 1822)	LC
29 <i>Labeo boggut</i> (Sykes, 1839)	LC
30 <i>Labeo calbasu</i> (Hamilton, 1822)	LC
31 <i>Labeo catla</i> (Hamilton, 1822)	T
32 <i>Labeo fimbriatus</i> (Bloch, 1795)	LC
33 <i>Labeo pangusia</i> (Hamilton, 1822)	NT
34 <i>Labeo porcellus</i> (Heckel, 1844)	LC
35 <i>Labeo potail</i> (Sykes, 1839)	EN
36 <i>Labeo rohita</i> (Hamilton, 1822)	T
37 <i>Oreochromis mossambicus</i> Knight and Kumar 2015	LC
38 <i>Osteobrama neilli</i> (Day, 1873)	LC
39 <i>Osteobrama peninsularis</i> Silas 1952	DD
40 <i>Osteobrama vigorsii</i> (Sykes 1839)	LC
41 <i>Osteochilichthys thomassi</i> (Day, 1877)	LC
42 <i>Parapsilorhynchus discophorus</i> Hora, 1921	VU
43 <i>Parapsilorhynchus tentaculatus</i> (Annandale, 1919)	LC
44 <i>Pethia longicauda</i> Katwate, Paingankar, Raghavan & Dahanukar, 2014	VU
45 <i>Pethia ticto</i> (Hamilton, 1822)	LC
46 <i>Puntius amphibius</i> (Valenciennes 1842)	DD
47 <i>Puntius fraseri</i> (Hora&Misra, 1938)	EN
48 <i>Pethia sahit</i> Katwate, Kumkar, Raghavan & Dahanukar 2018	EN
49 <i>Puntius sophore</i> (Hamilton, 1822)	LC
50 <i>Puntius stigma</i> (Valenciennes 1844)	NE
51 <i>Rohtee ogilbii</i> Sykes, 1839	LC
52 <i>Systemus sarana</i> (Hamilton, 1822)	LC
53 <i>Tor khudree</i> (Sykes, 1839)	LC
54 <i>Waikhomia sahyadriensis</i> (Silas 1953)	LC
Family: Danionidae	

55	<i>Barilius evezardi</i> Day, 1872	DD	Family: Pangasiidae	
56	<i>Cabdio morar</i> (Hamilton, 122)	LC	92	<i>Pangasianodon hypophthalmus</i> (Sauvage, 1878) Ext
57	<i>Chela cachius</i> (Hamilton 1822)	LC		Order: Gobiiformes
58	<i>Danio rerio</i> (Hamilton, 1822)	LC		Family: Gobiidae
59	<i>Devario aequipinnatus</i> (McClelland, 1839)	LC	93	<i>Glossogobius giuris</i> (Hamilton, 1822) LC
60	<i>Devario malabaricus</i> (Jerdon, 1849)	LC		Order: Synbranchiformes
61	<i>Opsarius bendelisis</i> (Hamilton 1807)	LC		Family: Mastacembelidae
62	<i>Opsharius barna</i> (Hamilton, 1822)	LC	94	<i>Mastacembelus armatus</i> (Lacepède, 1800) LC
63	<i>Rasbora daniconius</i> (Hamilton, 1822)	LC	95	<i>Macrogathus pancalus</i> Hamilton, 1822 LC
64	<i>Rasbora dandia</i> (Valenciennes 1844)	LC		Family: Synbranchidae
65	<i>Salmostoma balookee</i> (Sykes, 1839)	LC	96	<i>Ophichthys indicus</i> (Silas & Dawson, 1961) VU
66	<i>Salmostoma boopis</i> (Day 1874)	LC		Order: Anabantiformes
67	<i>Salmostoma novacula</i> (Valenciennes 1838)	LC		Family: Osphronemidae
68	<i>Salmostoma phulo</i> (Hamilton, 1822)	LC	97	<i>Osphronemus goramy</i> Lacepède, 1801 Ext
	Family: Xenocypridae			Family: Channidae
69	<i>Ctenopharyngodon idella</i> (Valenciennes, 1844)	Ext	98	<i>Channa gachua</i> (Hamilton, 1822) LC
70	<i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844)	Ext	99	<i>Channa marulius</i> (Hamilton, 1822) LC
	Order: Siluriformes		100	<i>Channa punctata</i> (Bloch, 1793) LC
	Family: Ailiidae		101	<i>Channa striata</i> (Bloch, 1793) LC
71	<i>Proeutropiichthys taakree</i> (Sykes, 1839)	LC		Order: Cichliformes
	Family: Horabagridae			Family: Cichlidae
72	<i>Pachypterus atherinoides</i> (Bloch 1794)	LC	102	<i>Oreochromis mossambicus</i> (Peters, 1852) Ext
73	<i>Pachypterus khavalchor</i> (Kulkarni 1952)	DD	103	<i>Oreochromis niloticus</i> (Linnaeus 1758) Ext
	Family: Bagridae			Order: Cyprinodontiformes
74	<i>Mystus bleekeri</i> (Day, 1877)	LC		Family: Aplocheilidae
75	<i>Mystus malabaricus</i> (Jerdon, 1849)	NT	104	<i>Aplocheilus lineatus</i> (Valenciennes, 1846) LC
76	<i>Mystus seengtee</i> (Sykes, 1839)	LC		Family: Poecilidae
77	<i>Sperata aor</i> (Hamilton, 1822)	LC	105	<i>Gambusia affinis</i> (Baird & Girard, 1853) Ext
78	<i>Sperata seenghala</i> (Sykes, 1839)	LC	106	<i>Poecilia reticulata</i> Peters, 1859 Ext
	Family: Ritidae			Order: Beloniformes
79	<i>Rita gogra</i> (Sykes, 1839)	LC		Family: Belonidae
80	<i>Rita kuturnee</i> (Sykes, 1839)	LC	107	<i>Xenentodon cancila</i> (Hamilton, 1822) LC
	Family: Sisoridae			Family: Hemiramphidae
81	<i>Bagarius bagarius</i> (Hamilton, 1822)	VU	108	<i>Hyporhamphus limbatus</i> (Valenciennes, 1847) LC
82	<i>Gagata itchkeea</i> (Sykes, 1839)	VU		Order: Mugiliformes
83	<i>Glyptothorax trewavasae</i> Hora, 1938	VU		Family: Ambassidae
84	<i>Glyptothorax annandalei</i> Hora, 1923	LC	109	<i>Chanda nama</i> Hamilton, 1822 LC
85	<i>Glyptothorax lonah</i> (Sykes, 1839)	LC	110	<i>Chanda ranga</i> Hamilton, 1822 LC
	Family: Siluridae			As per the IUCN Red list of Threatened Species (2024), 66 species were assessed as Least Concern, whereas six species assessed as Data Deficient, six species as Near Threatened (<i>Ompok bimaculatus</i> , <i>Garra bicornuta</i> , <i>Labeo pangusia</i> , <i>Clarius dussumieri</i> , <i>Mystus malabaricus</i> and <i>Anguilla bengalensis</i>), eight as Vulnerable (<i>Bagarius bagarius</i> , <i>Glyptothorax trewavasae</i> , <i>Gagata itchkeea</i> , <i>Hypselobarbus kolus</i> , <i>Pethia longicauda</i> , <i>Ophichthys indicus</i> , <i>Wallago attu</i>)
86	<i>Ompok bimaculatus</i> (Bloch, 1794)	NT		
87	<i>Pterocryptis wynaadensis</i> (Day, 1873)	EN		
88	<i>Wallago attu</i> (Bloch & Schneider, 1801)	VU		
	Family: Clariidae			
89	<i>Clarias magur</i> (Hamilton 1822)	EN		
90	<i>Clarias dussumieri</i> Valenciennes, 1840	NT		
91	<i>Clarias gariepinus</i> (Burchell, 1822)	Ext		

and *Parapsilorhynchus discophorus*) and nine as Endangered (*Botia striata*, *Bangana nukta*, *Hypselobarbus mussullah*, *Hypselobarbus curmuca*, *Labeo potail*, *Puntius sahit*, *Puntius fraseri*, *Pterocryptis wynaadensis* and *Clarias magur*). Three Species were Not Evaluated, three Transplanted and ten Exotic species.

Total three species transplanted for culture purpose as elsewhere in reservoirs (Sugunan, 1995) of Maharashtra namely *Labeo catla*, *Labeo rohita* and *Cirrhinus mrigala* are found in Kolhapur District.

Further, ten exotic species are reported (*Cyprinus carpio*, *Gambusia affinis*, *Oreochromis mossambicus*, *Clarias gariepinus*, *Ctenopharyngodon idella*, *Hypophthalmichthys molitrix*, *Pangasianodon hypophthalmus*, *Osphronemus goramy*, *Oreochromis mossambicus* and *Oreochromis niloticus*) of which three are listed under Global Invasive Species Database (Lowe, 2000) viz: *Cyprinus carpio*, *Gambusia affinis* and *Oreochromis mossambicus* which might have gained entry into reservoirs and main river stretches of the district. As per one of the authors observations three exotic fish *Clarias gariepinus* banned for culture in Maharashtra and elsewhere in India, *Pangasianodon hypophthalmus* and *Oreochromis niloticus* having restrictions for culture purpose were found in the catches of fishermen in Gadhinglaj town and Kolhapur fish market located at the banks of Hiranyakeshi river and Panchganga river respectively is an alarming sign for the riverine biodiversity.

The total of 19 species including 4 species identified to generic names and reported in literature were not incorporated in the present inventory. The explanation for its deletion is provided here forth. *Anguilla anguilla* (Linnaeus, 1758) is a European eel having no distributional record in India (Pike et al., 2020) and probably may be misidentification of *Anguilla bengalensis* and is also reported in Hiranyakeshi river by Kumkar et al. (2017). Further *Eutropiichthys vacha* (Hamilton, 1822) is known from the northern part of the Indian subcontinent southwards to the Mahanadi River (Ng, 2010) hence not incorporated in the list. Likewise, *Channa orientalis* is endemic to Sri Lanka (de Alwis et al., 2019) and probably misidentification of *Channa gachua* and is also reported in Hiranyakeshi river by Kumkar et al. (2017).

Gagata gagata (Hamilton, 1822) is having distributional range Ganges and Brahmaputra river drainages (Ng, 2010), *Ompok pabo* (Hamilton, 1822) is distributed in Brahmaputra, Ganges and Jamuna river basins in India (Ng & Tenzin, 2010), *Balitora shimogensis* is not having distributional range in Kolhapur region and specimens need to studied for further confirmation of presence (Kottelat, 1988) and is considered it as nomen nudum for lack of any distinguishing characters and tentatively referred to it as a synonym of *B. mysorensis* (Ali & Raghavan, 2011).

Perilampus atpar (Hamilton, 1822) is a synonym of *Chela cachius* (Hamilton, 1822), *Rita pavimentata* a

Synonym of *Rita gogra* (Skyes, 1839), *Rita hastata* synonym of *Rita kuturnee* (Sykes, 1839), *Gonoproktopterus kolus* synonym of *Hypselobarbus kolus* (Sykes 1839) hence not incorporated in the inventory.

Balitora mysorensis Hora (1941) is known from Karnataka and Kerala (Ali & Raghavan, 2011), *Lepidocephalichthys guntea* (Hamilton, 1822) is reported in parts of Maharashtra but not in Kolhapur region (Allen, 2018), *Puntius melanostigma* (Day, 1878) is certainly known from following states in India (Kerala, Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu) Dahanukar (2023) but its occurrence is Kolhapur district needs confirmation.

Mystus cavasius (Hamilton, 1822) is known from Krishna and Cauvery River drainages in southern India and is identified as *Mystus seengtee* (Sykes, 1839) (Chakrabarty, & Ng 2005).

In addition to this, Kumar et al. (2017) have reported 4 species up to generic level *Paracanthocobitis* sp, *Schistura* sp, *Bathygobius* sp and *Pethia* sp. Hence, not included in the inventory. Likewise, *Nemacheilus* spp. reported by Kalwar and Kelkar (1956) is also not incorporated in inventory.

Das et al. (2017) reported 127 species from the entire stretch of Krishna River system and noted that the species richness, diversity and abundance of fish are higher in Krishna River system in contrast to other river systems. The present results of meta-analysis justify the same. The increasing number and spatial distribution of exotic species is of utmost concern along with pollution from municipal and industrial pollution. Urgent need is felt to carry out stream wise surveys for documenting the present status of the diversity in Kolhapur district for its sustainable utilisation and conservation.

Conclusion

The present work essentially consists of distillations of the text and illustrations of earlier works as mentioned by Kottelat and Whitten (1996). Even then, the updated inventory in terms of nomenclature, systematic, IUCN status, endemic species, exotic species available in Kolhapur district will help students, researchers, planners and policy makers to develop fisheries, aquaculture, ornamental sector and frame conservation and management strategies and will form a basis for further studies.

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