Conservation Status of Fishes Reported from Tapi District of Gujarat, India

ABSTRACT

An attempt was made to study the conservation status of the fishes naturally occurring in Tapi District of Gujarat, India. The study was conducted from Jan. to Dec. 2023. During exploration, a total of 25 species of fishes belonging to different 13 families and 11 orders were identified and specimens were preserved in the laboratory. The details being Siluriformes 5 species (Pangasiidae - *Pangasius bocourti*, Siluridae - *Wallago attu*,Bagridae - *Sperata seenghala, Mystus nigriceps, Mystus cavasius*), Beloniformes 1 (Belonidae - *Strongylura strongylura*), Cichliformes1 (Cichlidae - *Oreochromis niloticus*), Cypriniformes10 (Cyprinidae- *Cirrhinus mrigala, Cyprinus bata,Ctenopharyngodon idella,Amblypharyngodon mola, Systomus sarana, Puntius sophore, Pethia ticto, Labeo rohita, Labeo bata, Catla catla*), Osteoglossiformes1 (Notopteridae- *Chitala chitala*), Gobiiformes 1 (Gobiidae- *Glossogobius giuris*), Perciformes2 (Ambassidae- *Chanda nama,Parambassis ranga*) Anabantiformes 1 (Channidae- *Channa punctata*) Synbranchiformes 1 (Mastacembelidae -*Mastacembelus armatus*) Atheriniformes 1 (Atherinopsidae - *Poblana ferdebueni*) and Clupeiformes 1 (Alosidae - *Alosa alosa*). As per species wise fish diversity of Tapi District of Gujarat, India is concerned, Cypriniformes dominated with 10 species, followed by Siluriformes 5, Beloniformes 1, Cichliformes1, Osteoglossiformes1, Gobiiformes 1, Perciformes2, Anabantiformes 1, Synbranchiformes 1,Atheriniformes 1 and Clupeiformes 1. Present conservation status of these fishes being out of 25 species of fishes identified, 1 species Critically Endangered (CR),1 species come under Not evaluated (NE), 2 species come under Lower risk-near threatened (LR-NT), and 21 under least concern (LC) so far.

keywords: Conservation, Fish diversity, Tapi District

INTRODUCTION

Fishes are cold blooded animal, aquatic vertebrates having cartilaginous or bony vertebral column, ventral muscular 2- chambered heart, tubular nerve chord, fins as paired appendages and gills for breathing. They constitute about half of the total number of vertebrate in the world VermaA.K. *et al.* (2016).

The aquatic biodiversity of the world is gettingdepleted faster every day due to habit loss, pollution,introduction of exotic species, over exploitation,agricultural runoff and other anthropogenic activitiesMoyle, P.B. *et al.*(1995).The fish are one of the most important organisms in aquatic ecosystems as those occupy primary and secondary consumer level. Though the freshwater bodies contribute only 0.1% of the total water of the planet, it harbours 40% of fish speciesNelson, J.S (1994).Fishes have high nutritive value, especially omega 3 fatty acids, because of which they are heart-friendly and improve reproductive and nervous system development Kalyankar, V.B. *et al.*(2012). India is one of the mega biodiversity centersfor the genetic resources in the world and the same istrue also in case of fishes. Nearly 2,868 species of fishesbelonging to 42 orders, 426 families and 1,019 generaare found in different ecosystems of this country. Theapproximate ecosystem-wise distribution of fishgermplasm resources of India are- freshwater (877;30.6%), brackish water (113; 3.9%) and marine (1368;65.5%). Out of these, about 258 species are commerciallyimportant which include cultured, cultivable and wild taxa,199 endemic and 275 game fishes. Further, more than447 exotic species have been introduced in Indian waters,mostly for ornamental purpose Lakra, W.S *et al.*(2009) and Anon (2015). Around the world, there is a growing concern over the loss of aquatic ecosystems and the biodiversity that goes along with themSingh,A.P. *et al.*(2024). The Convention on Biological Diversity (CBD)reaffirms the sovereign rights of the member nations overtheir entire genetic resources and envisages conservation,sustainable use and equitable sharing of the benefitsarising from the biological resources. More than 28,400finfish species have been reported throughout the worldwhich represents about half of the entire vertebratediversity Nelson J S (1994), Nelson J S (2006), Hilton-Taylor C (2000),Vie' J - C, (2008).Water is most productive resource for pisciculture. Fishes are the group of subphylum- Vertebrata, superclass- pisces in the world and are very useful inbiological researchesTripathi,R. B.*et al.*(2023).

District Tapi consist of seven Taluka namely Kukarmunda, Vyara, Valod, Uchhal, Dolvan, Nizar and Songadh. Covering an area above 3139 km. Having 523 total numbers of villages. Total population of Tapi district is about 8,07,022 out of which 90% of population belongs to tribal community. Tapi district consist of huge network (Tapi and its tributaries) along with huge Ukai and Dosvada riverine dam. It has been observed that approximately 30-40% of tribal population engaged in fisheries related activities.

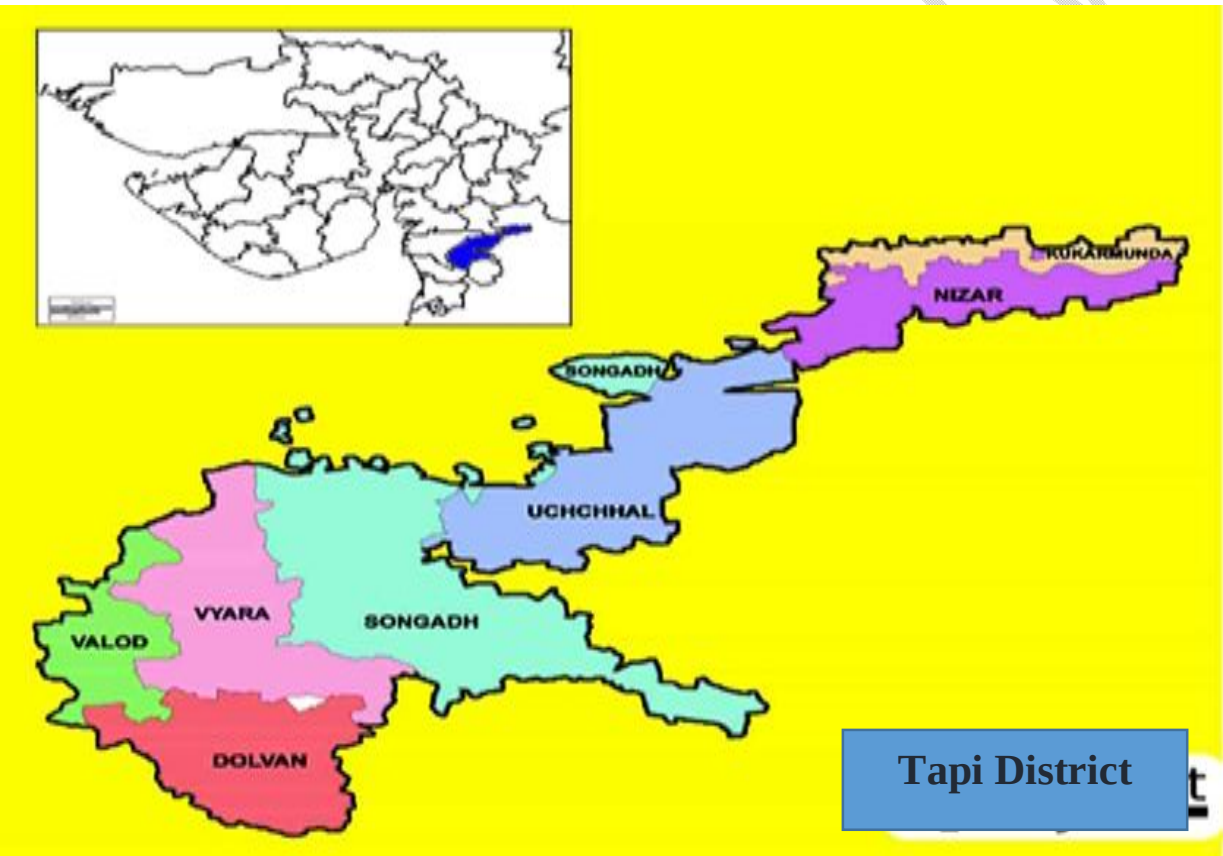
The present investigation was undertaken to Conservation status of fishes reported from Tapi District of Gujarat, India.

STUDY AREA: Conservation status of fishes reported from Tapi District of Gujarat, India (Image 1).

MATERIALS AND METHODS

Fish were caught and collected for the study from the river, dam by using hand nets, cast nets, hooks, pulling nets with the help of local people and fishermen while fishing. Studying fish recovery and collection were done twice in a month from January 2023 to December 2023. Fish were later identified using Mishra's standard keys, Mishra KS, Day, Day F,Jhingran VG, Jayaram Jayaram KC,Srivastava Gopalji, and L. Flora.

Image No. 1 Tapi district of some Taluka given below.



RESULTS

The present study during exploration, a total of 25 species of fishes belonging to different 13 families and 11 orders were identified and specimens were preserved in the laboratory. Present conservation status of these fishes being out of 25 species of fishes identified1 species Critically Endangered (CR),1 species come under Not evaluated (NE), 2 species come under Lower risk-near threatened (LR-NT), and 21 under least concern (LC) so far.Zoological names of these 25 different species of fishes recorded, with family, order and conservation status are shown in the Table No. 1. AndFigure No. 1 to 25 of some collected fishes given below.

Table No. 1: Different fish species with conservation status recorded during 2023 Data deficient (DD), Endangered (EN), and Critically Endangered (CR) Least concerned (LC), Lower risk-near threatened (LR-NT), Not evaluated (NE), Vulnerable (VU)

S.N	Scientific Name	Order	Family	Common Name	Conservation Status
1	*Pangasius bocourti*	Siluriformes	Pangasiidae	Basa Fish	LC
2	*Wallago attu*	Siluriformes	Siluridae	Freshwater Catfish	LR- NT
3	*Strongylura strongylura*	Beloniformes	Belonidae	Spottail Needlefish	NE
4	*Oreochromis niloticus*	Cichliformes	Cichlidae	Nile Tilapia	LC
5	*Sperata seenghala*	Siluriformes	Bagridae	Giant River-Catfish	LC
6	*Cirrhinus mrigala*	Cypriniformes	Cyprinidae	Mrigal Fish	LC
7	*Chitalachitala*	Osteoglossiformes	Notopteridae	Knifefish	LR- NT
8	*Ctenopharyngodon idella*	Cypriniformes	Cyprinidae	Grass Carp	LC
9	*Mystus nigriceps*	Siluriformes	Bagridae	Two-Spot Catfish	LC
10	*Amblypharyngodon mola*	Cypriniformes	Cyprinidae	Mola Carplet	LC
11	*Systomus sarana*	Cypriniformes	Cyprinidae	Olive Barb	LC
12	*Puntius sophore*	Cypriniformes	Cyprinidae	Spotfin Swamp Barb	LC
13	*Pethia ticto*	Cypriniformes	Cyprinidae	Ticto Barb	LC
14	*Cirrhinus reba*	Cypriniformes	Cyprinidae	Reba Carp	LC
15	*Labeo rohita*	Cypriniformes	Cyprinidae	Rohu	LC
16	*Labeo bata*	Cypriniformes	Cyprinidae	Bata Fish	LC
17	*Alosa alosa*	Clupeiformes	Alosidae	Allis Shad	LC
18	*Mystus cavasius*	Siluriformes	Bagridae	Gangetic Mystus	LC
19	*Glossogobius giuris*	Gobiiformes	Gobiidae	Tank Goby	LC
20	*Chanda nama*	Perciformes	Ambassidae	Glassfish	LC
21	*Parambassis ranga*	Perciformes	Ambassidae	Indian Glassy Fish	LC
22	*Channa punctata*	Anabantiformes	Channidae	Spotted	LC

				Snakehead	
23	*Mastacembelus armatus*	Synbranchiformes	Mastacembelidae	Zig-Zag Eel	LC
24	*Poblana ferdebueni*	Atheriniformes	Atherinopsidae	Rice Fish	CR
25	*Catlacatla*	Cypriniformes	Cyprinidae	Catla Fish	LC

Figure No. 1 to 25 of some collected fishes given below

Fig 1 : *Pangasius bocourti*

Fig 2 : *Wallago attu*

Fig 3 : *Strongylura strongylura*

Fig 4 : *Oreochromis niloticus*

	
Fig 5 : *Sperata seenghala*	Fig 6 : *Cirrhinus mrigala*
	
Fig 7 : *Chitalachitala*	Fig 8 : *Ctenopharyngodon idella*
	
Fig 9 : *Mystus nigriceps*	Fig 10 : *Amblypharyngodon mola*
	
Fig 11 : *Systomus sarana*	Fig 12 : *Puntius sophore*

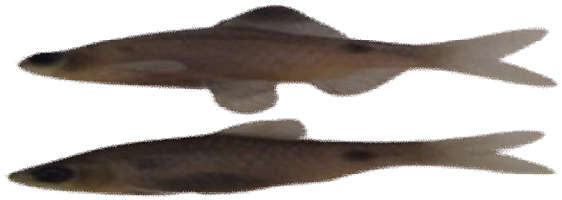
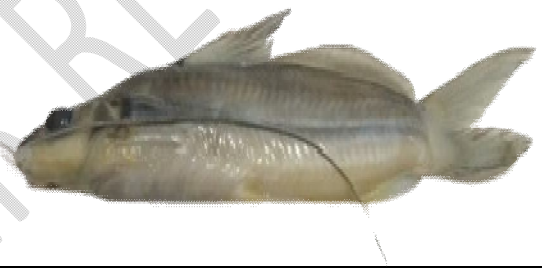


Fig 13 : *Pethia ticto*	Fig 14 : *Cirrhinus reba*
	
Fig 15 : *Labeo rohita*	Fig 16 : *Labeo bata*
	
Fig 17 : *Alosa alosa*	Fig 18 : Mystus cavasius
	
Fig 19 : *Glossogobius giuris*	Fig 20 : *Chanda nama*

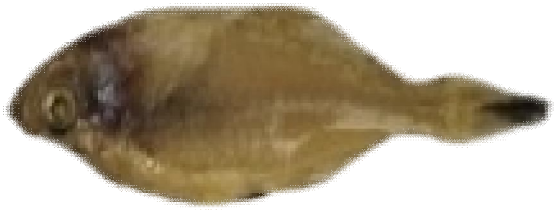


Fig 21 : *Parambassis ranga*	Fig 22 : *Channa punctata*
	
Fig 23 : Mastacembelus armatus	Fig 24 : *Poblana ferdebueni*
	
Fig 25 : *Catlacatla*	

DISCUSSION

The present study during exploration, a total of 25 species of fishes belonging to different 13 families and 11 orders were identified. The details being Siluriformes 5 species (Pangasiidae - *Pangasius bocourti*, Siluridae - *Wallago attu,*Bagridae - *Sperata seenghala, Mystus nigriceps, Mystus cavasius*), Beloniformes 1 (Belonidae - *Strongylura strongylura*), Cichliformes1 (Cichlidae - *Oreochromis niloticus*), Cypriniformes 10 (Cyprinidae - *Cirrhinus mrigala, Cyprinus bata,Ctenopharyngodon idella,Amblypharyngodon mola, Systomus sarana, Puntius sophore, Pethia ticto, Labeo rohita, Labeo bata, Catla catla*), Osteoglossiformes1 (Notopteridae

- *Chitala chitala*), Gobiiformes 1 (Gobiidae - *Glossogobius giuris*), Perciformes2 (Ambassidae - *Chanda nama,Parambassis ranga*) Anabantiformes 1 (Channidae - *Channa punctata*) Synbranchiformes 1 (Mastacembelidae -*Mastacembelus armatus*) Atheriniformes 1 (Atherinopsidae - *Poblana ferdebueni*) and Clupeiformes 1 (Alosidae - *Alosa alosa*). As per species wise fish diversity of Tapi District of Gujarat, India is concerned, Cypriniformes dominated with 10 species, followed by Siluriformes 5, Beloniformes 1, Cichliformes1, Osteoglossiformes1, Gobiiformes 1, Perciformes2, Anabantiformes 1, Synbranchiformes 1,Atheriniformes 1 and Clupeiformes 1. Present conservation status of these fishes being out of 25 species of fishes identified1 species Critically Endangered (CR),1 species come under Not evaluated (NE), 2 species come under Lower risk-near threatened (LR-NT), and 21 under least concern (LC) so far.

CONCLUSION

In the present study 25 species of freshwater fishes were recorded. The conservation status of the fishes 1 species Critically Endangered (CR),1 species come under Not evaluated (NE), 2 species come under Lower risk-near threatened (LR-NT), and 21 under least concern (LC). Commercially important species were being reduced in certain landing centers along left flank of TBR and alien species were occupying the native species niches. To monitor the continuous potential fish yield of the reservoir, adequate release of carp seeds, utilizing the other vacant niches, monitoring the illegal fishing actives along the reservoir and continuous annual documentation of fish catches is necessary.

- To preserve fish species and increase fish productivity, particularly for Indian major carps, rigorous adherence to fishing regulations is necessary. Major carps in India are expensive fish, but the population is downing. Nets with a mesh size of less than 2 cm should be completely prohibited in order to protect Indian big carp, especially during breeding season.
- Establishing a fish sanctuary is necessary to protect native fishes.
- Fishermen should be made more aware of the value of ornamental fish species and how to get a better price through awareness programmers.

LITERATURE CITED

A.K. Verma. and Shri Prakash., 2016. Fish Biodiversity of Alwara Lake of District Kaushambi, Uttar Pradesh, India. *Research Journal of Animal, Veterinary and Fishery Sciences*. Vol. 4(4), 5-9, April (2016).

A.P. Singh. and C. Vijayakumar., 2024. Conservation status of fishes reported from Sarua Lake of District Gorakhpur, (U. P.), India. *International Journal of Fauna and Biological Studies* 2024;

Anon 2015. Annual report. National bureau of Fish genetic and resource Lucknow.

Day F. The fauna of British India including Ceylon and Burma. Fishes. Taylor and Francis, London, 1989.

Hilton-Taylor C., 2000. IUCN Red List of Threatened Species. The IUCN Species Survival Commission, IUCN, Gland (Switzerland).

Jhingran VG. Fish and Fisheries of India. Hindustan Publishing Corporation, Delhi, India, 1991.

Jayaram KC. The freshwater fishes of the Indian region. Narendra Publishing House, Delhi-110006, India, 1999.

L. Flora, Studies of freshwater fishes of Uttar Pradesh, 2015, Ph.D. thesis, Manonmaniam Sundaranar University, Tamilnadu. The IUCN Red List of Threatened Species. Version 2015-4.

Lakra, W. S. and Pandey, A. K., 2009. Fish germplasm resources of India with special emphasis on conservation and rehabilitation of threatened species. In: Aquaculture Management (eds. Goswami U C and Dilip Kumar), 85-104. Narendra Pub. House, Delhi.

Mishra KS. An aid to identification of the common commercial fishes of India and Pakistan. Rec Indian Museum. 1959.

Moyle, P.B. and P.R. Moyle., 1995. Endangered fishes and economics international obligations, *Environmental Biology of Fishes,* 43: 29-37.

Nelson, J.S., 1994. Fishes of the World. *John Wiley and Sons, New York,* pp: 599.

Nelson, J. S., 1994. Fishes of the World. 3rd Edn. Johm Wiley & Sons, New York.

Nelson, J. S., 2006. Fishes of the World. 4th Edn. Johm Wiley & Sons, New Jersey.

R. B. Tripathi and Indu Singh., 2023.Fish diversity and occurrence from Bariya Talab of district Balrampur, Uttar Pradesh, India. *Int. J. Adv. Res. Biol. Sci.* (2023). 10(9): 105-118.

Srivastava Gopalji. Fishes of U.P. and Bihar, Vishwavidalaya Prakashan Chowk, Varanasi, India, 1998.

Vie' J. C, Hilton-Taylor. C and Start, S. N., 2008. Wildlife in a Changing World: An Analysis of the 2008 IUCN Red List of Threatened Species. IUCN, Gland (Switzerland).

V.B. Kalyankar, D.N. Nalage, T.B. Dhondage, S.S. Akhade and S.V. Jamdar., 2012. Study of Fish Biodiversity from Lower Dudhana Project at Parbhani District, India.*World Journal of Zoology* 7 (4): 320-322, 2012.