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# Ichthyofaunal Diversity and Conservation Perspective of Some Selected Wetlands in Nagzira – Navegaon (NN) Corridor, Gondia District of Maharashtra State, India

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## Abstract

Ichthyofaunal diversity of five lakes in Nagzira Navegaon Corridor in Gondia district of Maharashtra, India was conducted to assess the fish fauna. The present investigation deals with the ichthyofaunal diversity in NN corridor during the year October 2014 to September 2016. The results of present study reveal the occurrence of 62 fish species belonging to different 18 families. Among the 18 families, Cyprinidae family dominated over remaining families, The Cyprinidae were reported 27 species followed by Bagridae with 5 species and Channidae with 4 species whereas 3 species each of Ambasiidae, Clariidae, Mastacembelidae, Siluridae and a single species was reported of family Anguillidae, Anabantidae, Belonidae, Gobiidae, Heteropneustidae, Osphrinemidae, Nandidae, Noteopteridae and Sisoridae. In the present investigation, the number of fish species recorded from each wetland vary from 34 to 51 species, it was 34 species in Putli lake, 35 species in Naktya lake, 45 species in Umarzari lake, 51 species in Rengepar lake and 38 species in Chulbandh lake. Majority of the fish 81% of the total number of species were classed as least concern followed by 10 % near threatened, 5% data deficient, 3% vulnerable and 1% endangered as per the IUCN red list categories observed during study period in NN corridor.

***Kyewords:*** *Ichthyofauna, Nagzira - Navegaon (NN) Corridor, Gondia, Conservation.*

## Introduction

Globally many wetlands are under threat (Finlayson *et al.*, 1991). An increasing population in India places enormous pressure on natural wetlands and described major causes of wetland loss in that country, agriculture again dominating as the primary cause (Foote *et al.*,1996). Wetlands are capable of performing various functions as a result of physical, chemical and biological processes. Wetlands have been shown to improve water quality by

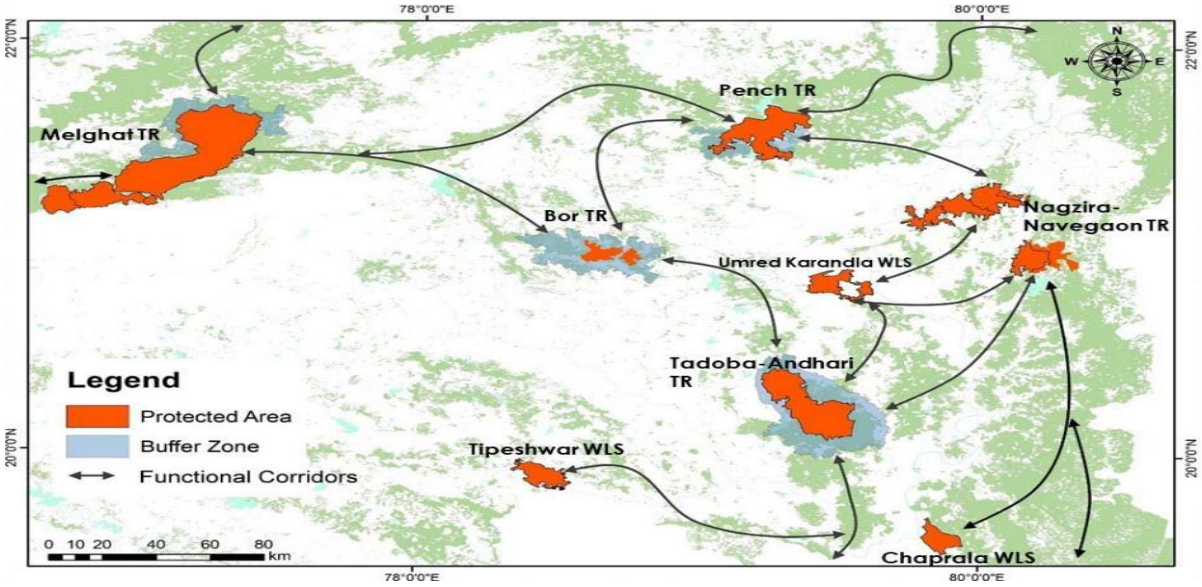
filtering out fertilizers and pesticides (Ramachandra *et al.*, 2002). The fresh water resources are very precious for the life on our planet. The number of dams, reservoirs, tanks, etc. has significantly increased in last few years. The aquatic ecosystem important and it has large number of economically important animals especially fish which is an important source of food. The development of fisheries in these fresh water resources needs to be increased through the scientific development (Pawara *et al.*, 2014). Fishes form the most diverse and protean group of vertebrates. Fishes are a precious source both as food and as material for scientific study (Marshell, 2000). Around the world approximately 22,000 species of fishes have been recorded out of which nearly 2420 are found in India, of which, 930 live in freshwater and 1570 are marine (Ubarhande *et al.*,2011) & (Kumar *et al.*, 2003). Fishes have formed an important item of human diet from time immemorial and are primarily caught for this purpose. Fish diet provides proteins, fat and vitamins A and D. Economic importance and scope of fish and fisheries especially in Maharashtra, it is essential to study the distribution and the availability of fish from lakes, rivers and tanks (Shinde, 2009). Thus there is need to survey fish fauna associated with different fresh water habitats, which will help in planning methods for their production. The freshwater ichthyofaunal diversity is changing and getting depleted fast as a result of the water pollution, destruction or degradation of habitats and invasion of exotic species (Revenga *et al.*, 2005). The water management systems of eastern Vidarbha observed that introduction of high yield species of fishes resulted in increased production till natural fish food was available in the tanks. Year after year the fishing continued, but the aspect of fish food was neglected. Today after 30-40 years of continuous production, the major problem for the fisheries cooperatives is drastically falling production of high yield species. The fish which used to reach to 1-1½ kg in a year now do not grow over 200 gms in a year (Rajankar *et al.*, 2011). A total of 116 fishing-cooperative societies in Bhandara district and 134 fishing-cooperative societies recorded in Gondia district (Velankar, 2011). Each society functions in the average area of 5 sq. km. Many wetlands are being negatively affected due to over-exploitation beyond their rejuvenating capacity. These impacts are difficult to detect and quantify but they will ultimately accelerate the rate of conversion of the wetlands to terrestrial one. Wetlands support congregation of large number of migratory and residential species of birds as it has high nutritional value as well as productivity (Lakshmi,2006).

The present investigation was undertaken to study the ichtyhofaunal diversity of five lakes in NN corridor. The objective of study was to give recent data regarding ichthyofaunal diversity of the NN corridor lakes, aiming to contribute a better knowledge of the Ichthyofaunal diversity and a tool for conservation planning of aquatic environment in NN corridor region.

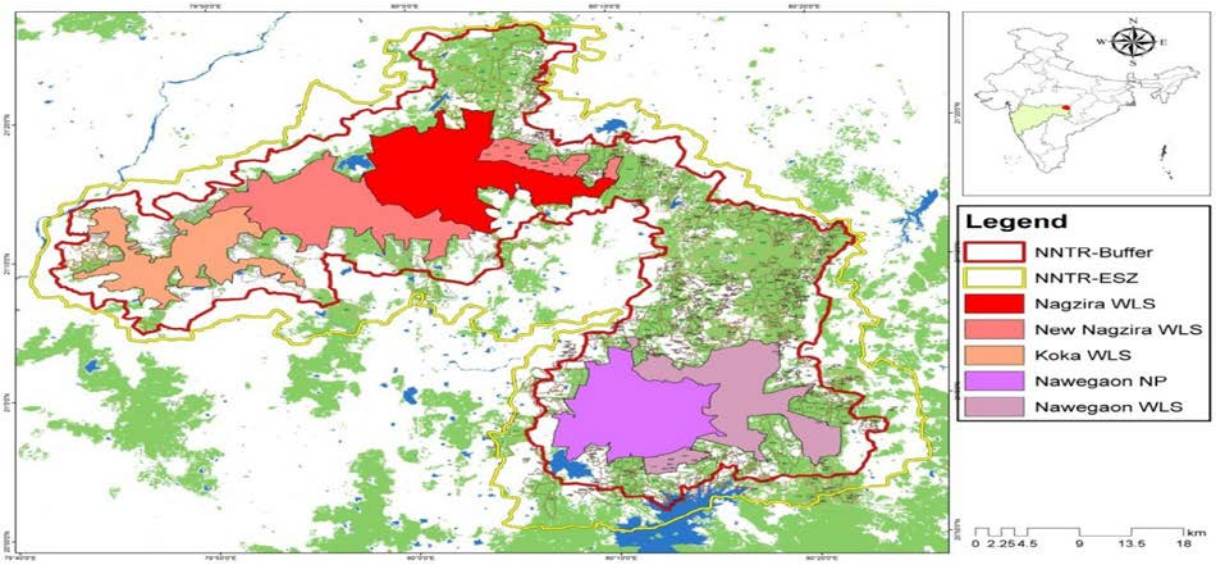
## Material and Methods

The present work was carried out for two years from October 2014 to September 2016 in five wetlands of Nagzira Navegaon (NN) corridor. The NN corridor area covers an area of about 620 km distributed in three Tahsil viz. Sadak Arjuni, Deori and Goregaon in Gondia district of Maharashtra state. The corridor was studied into five blocks and a wetland was selected from each blocks; Putli lake from Ghat section block, Naktya lake from Alebedar block, Umarzari lake from Jambhadi block, Rengepar lake from Sasekaran hills block and Chulbandh lake from

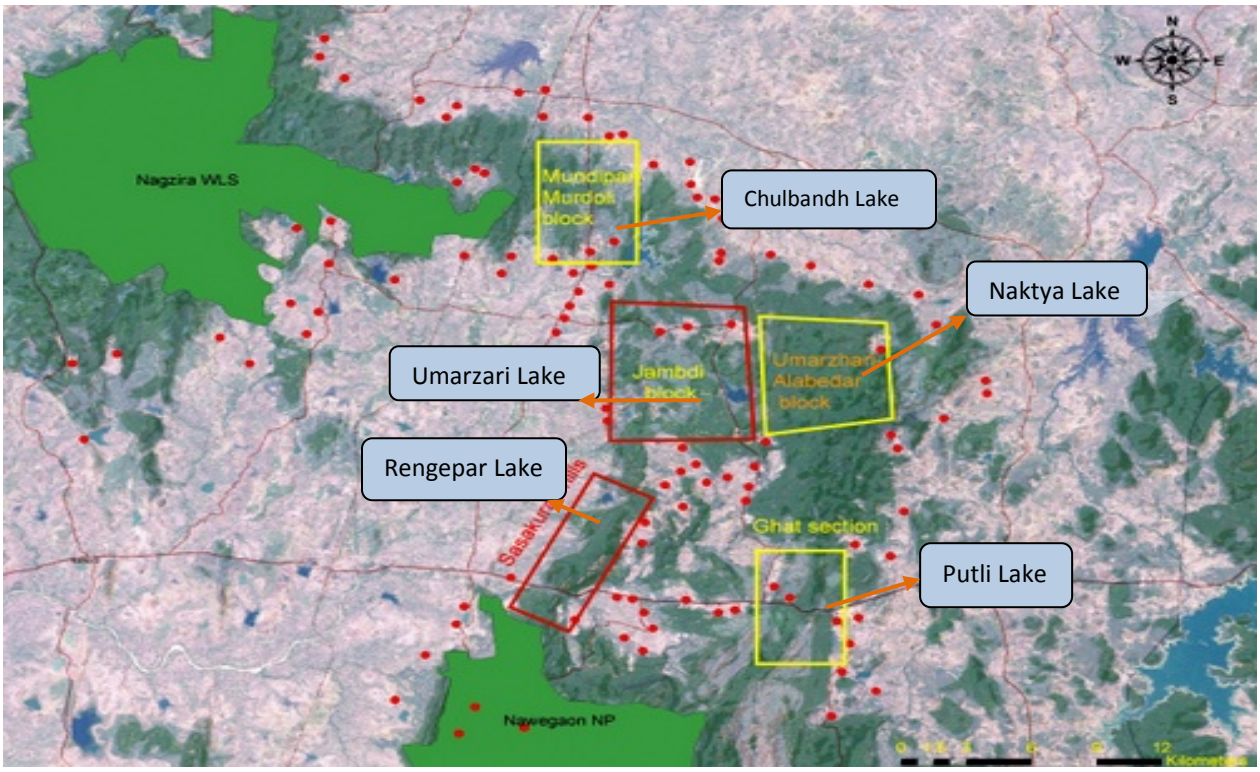
Mundipar block. The fish study was carried out on monthly basis in different seasons during the study period. The seasons defined as winter from October to January, summer from February to May and monsoon from June to September. Fishes were collected with the help of local fishermen during their fishing period using different type of nets namely gill nets, cast nets and drag nets. Fishes were brought to laboratory and preserved in 10% formalin solution in separate specimen jars according to the size of species. Small fishes were directly placed in the 10% formalin solution. While large fishes were giving an incision in their abdomen and preserved. Species identification and confirmation were carrying out with the help of standard keys and books of Jayram (1999) and Talwar *et al.*, (1991).




**Picture 1: The Vidarbha landscape showing the protected areas with their structural and functional interconnections (Map Source - NNTR)**




**Picture 2: Protected Area, Buffer and Eco-sensitive Zone of Nagzira-Navegaon Tiger Reserve (Map Source-NNTR official website)**




**Picture 3: Map of NN Corridor showing selected study sites (→ Study Sites)**

## Results and Discussion

The present study reveals the occurrence of 62 fish species belonging to different 18 families. Among the 18 families, Cyprinidae family dominated over remaining families, The Cyprinidae were reported 27 species followed by Bagridae with 5 species and Channidae with 4 species whereas 3 species each of Ambasiidae, Clariidae, Mastacembelidae, Siluridae and a single species was reported of family Anguillidae, Anabantidae, Belonidae, Gobiidae, Heteropneustidae, Osphrinemidae, Nandidae, Noteopteridae and Sisoridae. In the present investigation, the number of fish species recorded from each wetland were vary from 34 to 51 species, it was 34 species in Putli lake, 35 species in Naktya lake, 45 species in Umarzari lake, 51 species in Rengepar lake and 38 species in Chulbandh lake. Majority of the fish 81% of the total number of species were classed as least concern followed by 10 % near threatened, 5% data deficient, 3% vulnerable and 1% endangered as per the IUCN red list categories observed in NN corridor. It was found that certain species of fishes classified under different threat categories as per the IUCN threatened criterian. Of these, *Anguilla bengalensis* (Tambu), *Oreochromus mossambicus* (Kalitilapia), *Hypophthalmichthys molitrix* (Big Head), *Ompok bimaculatus* (Waranja), *Ompak pabda* (Bolya), *Wallago attu* (Savla) and *Bagarius yarelli* (Bod) were placed in the near threatened (NT) category, *Tor Khudree* (Wadis) and *Hypselobarbus curmuca* (Tembrush) were classified under the endangered (EN) category, *Cyprinus carpio* (Sipnus) was placed in the vulnerable (VU) category. *Anguilla bengalensis was* recorded at Umarzari lake however it was absent in all other lakes during the study period. other fish species Waranja (*Ompok bimaculatus*) recorded at Rengepar lake and absent in all other 4 lakes, Bolya (*Ompak pabda*) and Bod (*Bagarius yarelli*) were recorded in

Umarzari and Rengepar lake, Savla (*Wallago attu*) was recorded at Rengepar and Naktya lake and Kalitilapia (*Oreochromus mossambicus*) was recorded at Chulbandh and Naktya lake. *Tor Khudree* was recorded from Rengepar and Chulbandh lake. Internationally, alien fish species top the list of threats to indigenous fish populations. It was observed during the present investigation that the fish locally called as 'Koi' (*Anabas testudineus*) in the corridor lakes was rapidly becoming a major alien threat. It now occurs in all five lakes viz. Putli, Naktya, Umarzari, Rengepar and Chulbandh lake of the corridor. The fish covered fine spines on its body which protect it from predators.

During the present investigation some threats were observed for fish migration. The overflow structure of the lakes viz. Putli, Naktya, Umarzari and Chulbandh lake were found steep in structure however it was slope at Rengepar lake. Therefore the reverse fish migration was possible at Rengepar lake which allowed fishes to breed and increase the number of local fish species. But in other lakes there seems little possibility for fishes to climb such steep overflow structure and enter in the lake during reverse fish migration. On the other hand, the fisher-community practiced fishing during rivers fish migration at all lakes during the study period. It was observed that fisher-community thrown wasted net in an open area at the peripheral part of lake which pose a major threat to bird species.

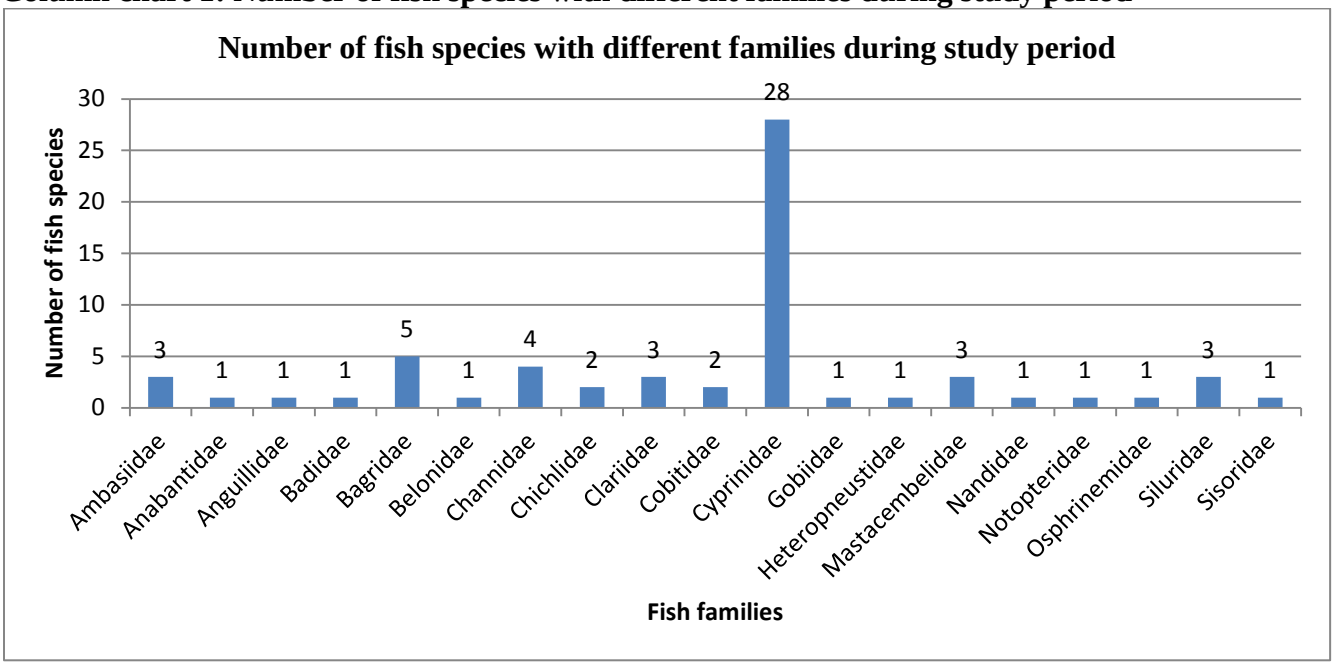
**Table 1- Diversity and status of fishes during study period**

| Sr. No. | Local Name | *Scientific name* | Family | IUCN Status | Putli Lake | Naktya Lake | Umarzari Lake | Rengepar Lake | Chulbandh Lake |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Chandni | *Parambassis ranga* | Ambassidae | LC | | | √ | √ | |
| 2 | Lambizamdi | *Chanda nama* | Ambassidae | LC | | | √ | √ | |
| 3 | Zamdi | *Parambassis lala* | Ambassidae | LC | √ | √ | | √ | √ |
| 4 | Tambu | *Anguilla bengalensis* | Anguillidae | NT | | | √ | | |
| 5 | Koi | *Anabas testudineus* | Anabantidae | LC | √ | √ | √ | √ | √ |
| 6 | Rengdya Katwa | *Mystus bleekeri* | Bagridae | LC | √ | √ | √ | √ | √ |
| 7 | Jalya Katwa | *Mystus cavasius* | Bagridae | LC | √ | √ | √ | √ | √ |
| 8 | Rengdya Katwa | *Mystus vittatus* | Bagridae | LC | | | | √ | |
| 9 | Shingta | *Sperata seenghala* | Bagridae | DD | | √ | √ | √ | √ |
| 10 | Gagar | *Rita gogra* | Bagridae | LC | | | √ | | |
| 11 | Telgi | *Badis badis* | Badidae | LC | √ | | √ | √ | √ |
| 12 | Chachya | *Xenentodon cancila* | Belonidae | LC | √ | √ | √ | √ | √ |
| 13 | Maral | *Channa marulius* | Channidae | LC | | | √ | √ | |
| 14 | Bilona | *Channa gachua* | Channidae | LC | √ | √ | √ | √ | √ |
| 15 | Botri | *Channa punctata* | Channidae | LC | √ | √ | √ | √ | √ |

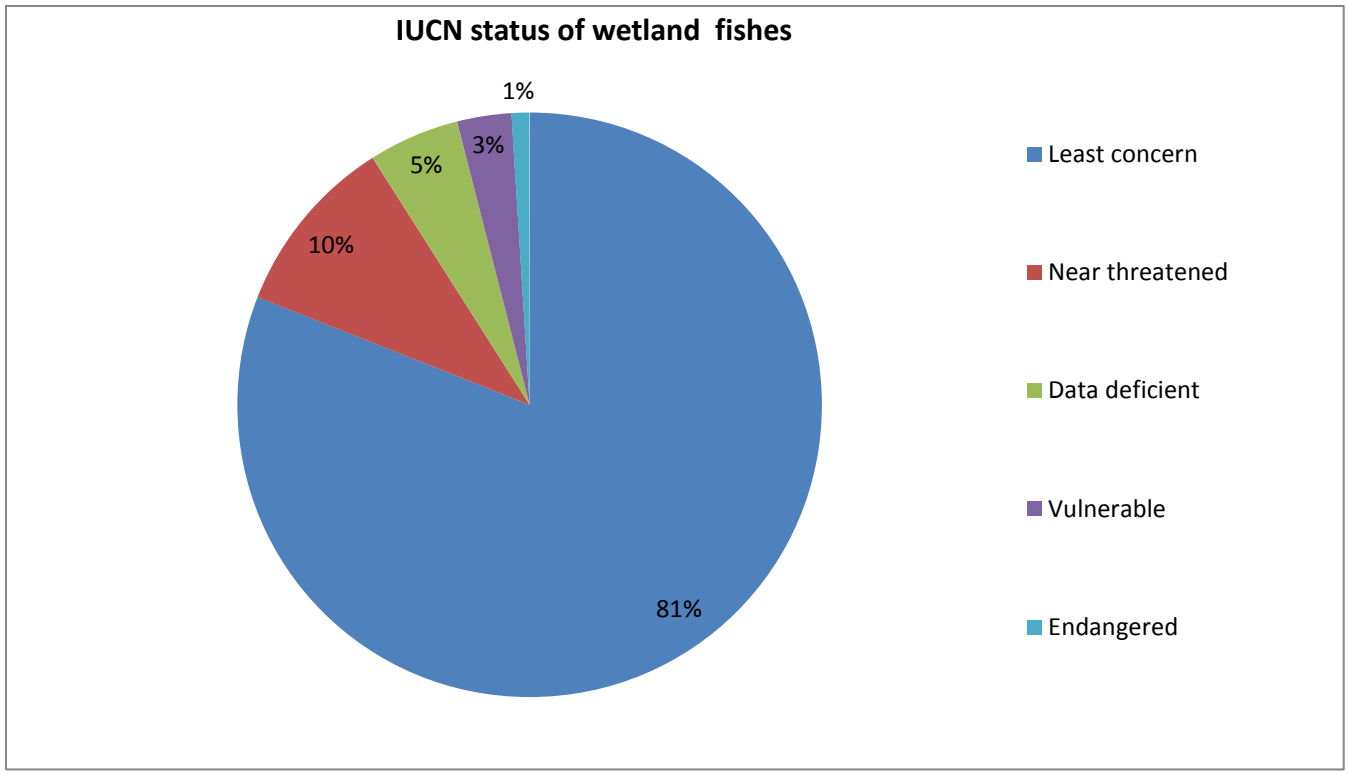
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 16 | Dadak | *Channa striata* | Channidae | LC | √ | √ | √ | √ | √ |
| 17 | Warlya | *Clupisoma taakree* | Ailiidae | LC | | | √ | √ | |
| 18 | Wagur | *Clarias batrachus* | Clariidae | LC | √ | √ | | √ | √ |
| 19 | Sarkari Wagur | *Clarius gariepinus* | Clariidae | LC | √ | √ | √ | √ | √ |
| 20 | Laltilapia | *Oreochromis niloticus* | Chichlidae | LC | √ | √ | √ | √ | √ |
| 21 | Kalitilapia | *Oreochromis mossambicus* | Chichlidae | NT | | √ | | | √ |
| 22 | Gahandi | *Lepidocephalichthys guntea* | Cobitidae | LC | | | √ | | |
| 23 | Lahangahandi | *Lepidocephalichthys thermalis* | Cobitidae | LC | √ | | √ | √ | |
| 24 | Katla | *Labeo catla* | Cyprinidae | LC | √ | √ | √ | √ | √ |
| 25 | Mrugal | *Cirrhinus mrigala* | Cyprinidae | LC | √ | √ | √ | √ | √ |
| 26 | Grass Carp | *Ctenopharyngodon idella* | Cyprinidae | LC | √ | √ | √ | √ | √ |
| 27 | Sipnus | *Cyprinus carpio* | Cyprinidae | VU | √ | √ | √ | √ | √ |
| 28 | Silver Carp | *Hypophthalmichthys nobilis* | Cyprinidae | DD | √ | √ | √ | √ | √ |
| 29 | Big Head | *Hypophthalmichthys molitrix* | Cyprinidae | NT | | | √ | | |
| 30 | Rohu | *Labeo rohita* | Cyprinidae | LC | √ | √ | √ | √ | √ |
| 31 | Mulki Rohu | *Labeo calbasu* | Cyprinidae | LC | | √ | √ | √ | √ |
| 32 | Khunus | *Labeo gonius* | Cyprinidae | LC | √ | √ | √ | √ | √ |
| 33 | Piparpan | *Osteobrama cotio* | Cyprinidae | LC | | √ | | √ | √ |
| 34 | Khavlitepri | *Oreichthys cosuatis* | Cyprinidae | LC | √ | | √ | | √ |
| 35 | Gadad | *Pethia conchonius* | Cyprinidae | LC | √ | √ | √ | √ | |
| 36 | Karvali | *Puntius chola* | Cyprinidae | LC | √ | √ | | √ | √ |
| 37 | Poshti | *Puntius sarana* | Cyprinidae | LC | √ | √ | √ | √ | √ |
| 38 | Karwalitepari | *Puntius sophore* | Cyprinidae | LC | | √ | | √ | |
| 39 | Tepari | *Puntius ticto* | Cyprinidae | LC | √ | | | | √ |
| 40 | Karkhandi | *Puntius gelius* | Cyprinidae | LC | √ | | √ | | |
| 41 | Pershi | *Salmophasia bacaila* | Cyprinidae | LC | √ | √ | √ | √ | √ |
| 42 | Molwar | *Amblypharyngodon mola* | Cyprinidae | LC | | √ | √ | √ | √ |
| 43 | Ichgani | *Brachydanio rerio* | Cyprinidae | LC | √ | | | | |
| 44 | Palvi | *Devario aequipinnatus* | Cyprinidae | LC | √ | | √ | √ | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 45 | Gani | *Rasbora daniconius* | Cyprinidae | LC | | √ | √ | √ | √ |
| 46 | Gotechati | *Garra mullya* | Cyprinidae | LC | | | √ | | √ |
| 47 | Wadis | *Tor khudree* | Cyprinidae | EN | | | | √ | √ |
| 48 | Tembrush | *Hypselobarbus curmuca* | Cyprinidae | EN | | √ | | √ | |
| 49 | Nevara | *Labeo boggut* | Cyprinidae | LC | | | | √ | |
| 50 | Kanas | *Labeo fimbriatus* | Cyprinidae | LC | √ | √ | | √ | √ |
| 51 | Rengsa | *Glossogobius giuris* | Gobiidae | LC | √ | √ | | √ | √ |
| 52 | Singur | *Heteropneustes fossilis* | Heteropneustidae | LC | √ | √ | √ | √ | √ |
| 53 | Chakmaki | *Trichogaster fasciata* | Osphronemidae | LC | √ | √ | √ | √ | √ |
| 54 | Bam | *Macrognathus aral* | Mastacembelidae | LC | | | √ | √ | |
| 55 | Penwair | *Macrognathus pancalus* | Mastacembelidae | LC | √ | | √ | √ | √ |
| 56 | Wair | *Mastacembelus armatus* | Mastacembelidae | LC | | | √ | | |
| 57 | Dukkar | *Nandus nandus* | Nandidae | LC | | | | √ | |
| 58 | Bhadar | *Notopterus notopterus* | Notopteridae | LC | | | √ | √ | √ |
| 59 | Waranja | *Ompok bimaculatus* | Siluridae | NT | | | | √ | |
| 60 | Bolya | *Ompak pabda* | Siluridae | NT | | | √ | √ | |
| 61 | Palan/Savla | *Wallago attu* | Siluridae | NT | | √ | | √ | |
| 62 | Bod | *Bagarius yarelli* | Sisoridae | NT | | | √ | √ | |
| **Total** | | | | | **34** | **35** | **45** | **51** | **38** |

**Column chart 1: Number of fish species with different families during study period**



**Pie chart 1: IUCN status of wetland fishes**

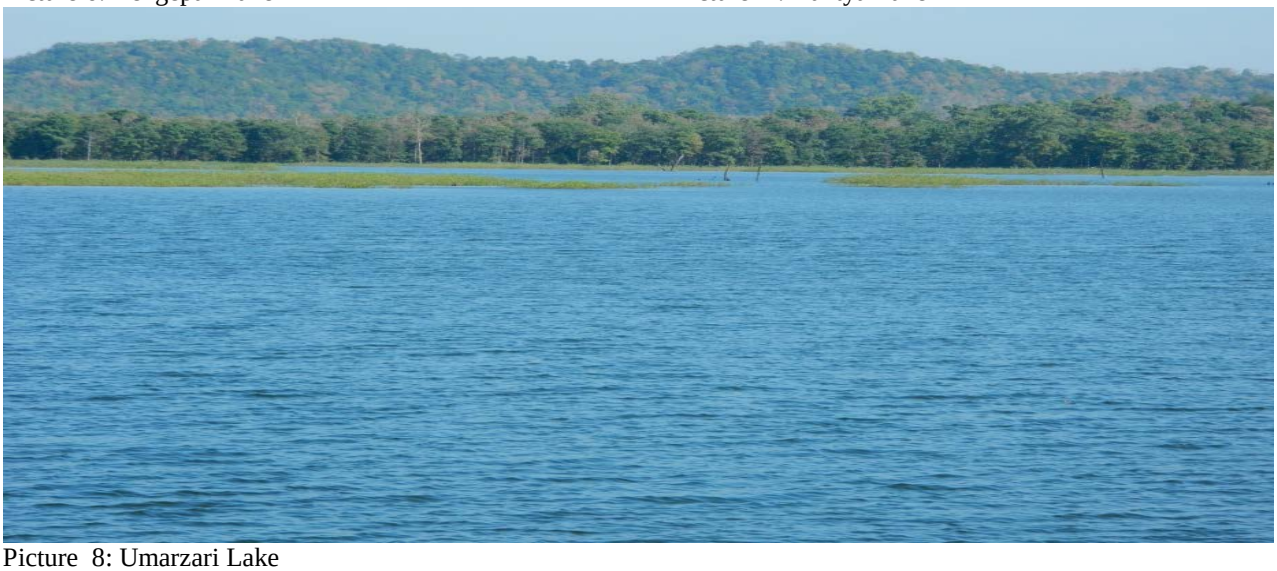



Picture 4: Putli Lake

Picture 5: Chulbandh Lake

Picture 6: Rengepar Lake

Picture 7: Naktya Lake



Picture 8: Umarzari Lake

Picture 9: Fish study during fishing

Picture 10: Fish study during fishing

## Conclusion

Fishing during reverse fish migration should be banned by fishery authorities and fishing cooperative societies. The fishermen should make aware about scientific training for fishing which may help in high yield of fish production in the NN corridor lakes. There is a rich diversity of fish in NN corridor lakes but majority of the fish diversity is threatened by anthropogenic activities. Ichthyofaunal diversity and distribution is useful for designing and implementing conservation strategies. Fishery Department should provide scientific training to fishermen, provide facilities to fish farmers and provide loan on subsidize basis may help in high yield fish species and there is an urgent need to follow legislative and other measures for conservation of fishery.

## Acknowledgement

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