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Fresh water Ichthyofauna of Manas National Park and its adjacent villages in Assam

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Abstract

The survey was carried out in Manas national park and its adjacent villages, from January 2014 to September 2014. A total eighty five indigenous (85) ichthyospecies were identified from seven randomly selected lotic and lentic water bodies from Manas National park and its fringe village's areas during the survey period. Out of these eighty five (85) ichthyospecies belonging to 10 orders and 26 families and 55 genera and from these 85 ichthyospecies 2.35% belong to order Anguilliformes, followed by Beloniformes 1.17%, Clupeiformes 3.53%, Cypriniformes 41.18%, Cyprinodontiformes 1.17%, Osteoglossiformes 2.35%, Perciformes 22.35%, Siluriformes 20%, Symbranchiformes 4.71%, and Tetraodontiformes 1.14%. And out of eighty five (85) ichthyospecies 88.24% considered as LC, 1.17% considered as EN, 1.17% considered as VU 7.05% considered as NT, 1.17% considered as DD and 1.17% considered as NA as per IUCN 2014.3 Status report. *Pisodonophis boro* and *Schistura corica* are important finding during survey.

Keywords: Ichthyofauna, Manas National park, Threats, Assam

Introduction

In third world countries, fish constitute one of the most important and easily available food-item of sustenance for many people. Ichthyofauna are immutable living components of water bodies. Ichthyofauna form the most diverse and protean group of vertebrates. Assam is gifted with many extensive water bodies commonly known as Beels^[1]. The Brahmaputra drainage system in North East India is one of the largest hydrographic basins in Southeast Asia and sustains a very rich and diverse aquatic gene pool, particularly fishes and such as the region is featured among the global hotspots of fresh water fish diversity^[12]. The north-east part of India is gifted with varieties of fresh water habitats mainly in the form of the mighty Brahmaputra and its major tributaries. River with its tributaries and rivulets are a unique type of ecosystem which generally cover different types of bio-geographical regions. River is the natural drainage system of the land mass of the earth which moves continuously. In Assam, the tributaries of river Brahmaputra basin through supports plentiful biodiversity and offers livelihood and nutritional security has been less studied from conservation point of view. The planet has the divergence of supporting huge ichthyofaunal diversity; represent more than half of the total number of approximately 54,711 valid vertebrate species^[21]. There are descriptions of an estimated 27,977 valid species of fishes^[21] of 54,711 vertebrate species recognized the world over 27,977 under 515 families and 4,494 genera^[21] are valid species of fish of which 11,952 are of freshwater and 12,457 species using freshwater. The Indian subcontinent ichthyofauna is an assemblage of about 2500 species depicting diverse characteristics, of which 930 belonging to 326 genera, 99 families and 20 orders inhabiting the inland waters and 1,570 are marine^[22]. Out of these 400 species are commercially important, which include cultured, cultivable and wild. On the global scale, Indian fish represents 11 % of species, 24% of genera, and 57% of families^[27].

Northeastern Region of India is globally known as a global fresh water hotspot for ichthyofaunal diversity. Ichthyofaunistic studies of the northeastern region of India, which is elements of the Indo-Gangetic region and to some extent, elements of the Myanmar's and South-Chinese region^[16] is barely studied. Hora^[2, 3, 4, 5, 6, 7, 8, 9, 10] is one of the pioneer workers on the fishes of northeastern India. Ghosh and Lipton^[1] had reported 172 species of fishes with reference to their economic importance while Sen^[13] reported 187 species of fishes from Assam and its environs. The fresh water ichthyofaunal diversity of Assam was reported by Dey^[18, 19] is one of the pioneer workers on the ichthyofauna. Sinha^[14] compiled a list of 230 species of fishes from northeastern India. Nevertheless, Nath and Dey^[24] recorded 131

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species of fishes from the drainages in Arunachal Pradesh alone. Later Sen [17] compiled a list of 285 fish species belonging to 114 genera under 38 families of fishes from northeastern India; which is approximately 33.13% of total India fresh water fishes. To the best knowledge of the author, there was no morphological based research effort on ichthyofauna was carried out in Manas National Park. Subsequently, the aim of the present paper was to carry out the first comprehensive morphological based research effort on ichthyofauna in Manas national park Assam.

2. Methodology

The survey was carried out from January 2014 to September 2014.

2.1: Location of Study area: The present work was carried out in Manas National Park (26°35'-26°50'N, 90°45'-91°15'E) and its fringe villages. Manas national park is a major conservation area. It forms a part of Malayan and Indo-Bhutan realms and is a key conservation area in the Jigme Dorji-Manas- Bumdaling conservation landscape in the eastern Himalayan ecoregion [15]. It is an internationally renowned protected area in India. The study area included the Bansbari range of Manas national park which is 17 km from Barpeta road. It is in the Barpeta District of Assam. Manas national park occupies an area of 500 km².

2.2: Data collection, analysis and identification:

Survey was conducted in seven different zones and the random sampling method in different water bodies (lotic and lentic) of Manas national park was carried out. Survey was conducted in different parts of Sangrang stream, Beki river, small streams and different wetlands (kuri beel) in Manas national park and its associated villages. Fish samples were also collected from the local (fringe villages) fish markets of the studied area to ascertain the fish species composition as far as possible, the fish species were identified in the field itself. Fishes were caught by using different types of Gill nets, Cast nets, Drag nets, scop nets, bamboo traps and angling with the aid of local fishermen. In addition nearby fishermen communities have been interviewed. After samples were photographed, collected sample was released on same water bodies (specimens those were collected from Manas national park). For better photography some specimens (specimens those were collected from local fish markets and peripheral/buffer area) were placed in transparent water tank and took photographed. After that all specimens were identified according to Jayaram [23], Talwar and Jhingran [22] and Das and Biswas [20]. During identification morphometric characters (Total length, Standard length, Head size, Mouth shape, caudal fin shape) Meristics count (Number of Spine and rays of all fins, Lateral line scale, pre-dorsal scales) also concerned. Nomenclature will be done on Fish base database [26]. For ascertaining the conservation status (threat criteria) of the ichthyospecies is based on IUCN [25].

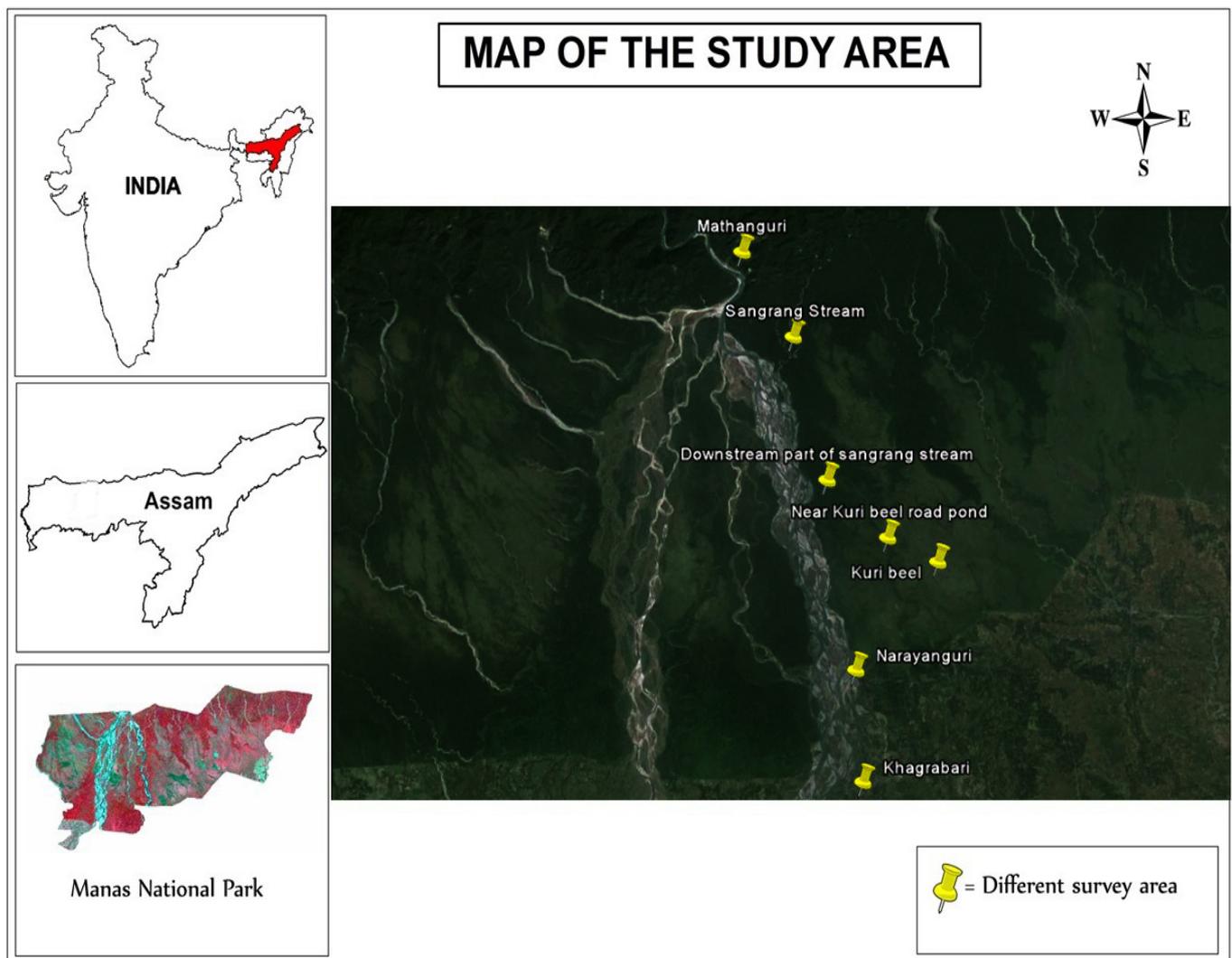


Fig 1: Study area survey Map

3. Result and Discussion

Manas national park not only holding unique wildlife diversity but also provides a convenient habitat for fresh water ichthyofauna. Manas national park have diverse variety of fishes such as Catfishes, loaches, Barbs, Gobies, Eels, different Gouramis and different *Garra sp.* etc. A total eighty five indigenous (85) ichthyospecies were identified from seven randomly selected lotic and lentic water bodies from Manas National park and its fringe village's areas during the survey period. Out of these eighty five (85) ichthyospecies belonging to 10 orders and 26 families and 55 genera and from these 85 ichthyospecies 2.35% belongs to Order Anguilliformes, followed by Beloniformes 1.17%, Clupeiformes 3.53%, Cypriniformes 41.18%, Cyprinodontiformes 1.17%, Osteoglossiformes 2.35%, Perciformes 22.35%, Siluriformes 20%, Symbranchiformes 4.71%, and Tetraodontiformes 1.14%. And out of eighty five (85) ichthyospecies 88.24% considered as LC (Least concern criteria), 1.17% considered as EN (Endangered criteria), 1.17% considered as VU (Vulnerable criteria), 7.05% considered as NT (Near Threatened criteria), 1.17% considered as DD (Data Deficient criteria) and 1.17% considered as NA (Not assessed criteria) as per IUCN 2014.3 Status report.

3.1 Morphological Information (Body, Fin Formula, Barbels & Lateral Line) Of Ichthyospecies from Manas National park

All the relevant morphological characteristics details about fresh water fishes were done by author through morphological study. The arrangement of fish families is based on Jayaram (2013). The fin-formula is consist with the letters D for dorsal fin; D₁ for 1st dorsal fin, D₂ for 2nd dorsal fin, P₁ for pectoral fin, P₂ for pelvic fin, A for anal fin and C for caudal fins.

I. ORDER – OSTEOGLOSSIFORMES

Family- Notopteridae

1. *Chitala chitala*: (Local name: Chital) - Body elongated and strongly compressed. Eyes large and superior. Anal fin very long, Pelvic fin rudimentary. Barbels absent. Lateral line present. 18- 22 silvery vertical bands in dorsal side. Caudal and anal fin are confluent.
Fin formula-D₁. 9; P₁. 14-16; P₂. 6; A. 114-118.
2. *Notopterus notopterus*: (Local name: Kanduli) – Body highly compressed. Eyes large. No barbels. Anal fin very long, Pelvic fin rudimentary. Lateral line present. Minute dark spot on head and dorsal side of body. Barbels absent. Caudal and anal fin are confluent.
Fin formula-D₁. 8; P₁. 15; P₂. 6; A. 98.

II. ORDER - ANGUILLIFORMES

Family – Anguillidae

3. *Anguilla bengalensis*: (Local name: Bau mas) - Body elongate, look like snake. Head conical. Tail compressed. Lateral line present. Eyes small. Dorsal, Caudal and anal fin are confluent. Skin wet and slippery. Scales minute. Barbels absent. Body is light brownish dorsally, and numerous dark black spots present in upper surface of body.
Fin formula-D₁. 223; P₁. 16; P₂. 0; A. 225; C. 11
4. *Pisodonophis boro*: (Local name: Nal Bami) - Body elongate and cylindrical. Tail compressed, tapering. Abdomen rounded. Lateral line present. Barbels absent. Body is light olive grey in colour. Eyes small. Dorsal part of body is covered by very small brownish black spot.
Fin formula-D₁. 0; P₁. 0; P₂. 0; A. 0; C.0

II. ORDER- CLUPEIFORMES

Family- Clupeidae

5. *Gudusia chapra*: (Local name: Koroti) – Body highly compressed and oblong. Snout rounded Dorsal fin small, anal fin elongate and caudal fin forked. Eyes large, lips thin. Lateral line missing. Barbels absent. Head short and mouth upturn.
Fin formula-D₁.11; P₁. 10; P₂. 6; A. 20-22. C. 19-21
6. *Tenulosa ilisha*: (Local name: Ilish) - Body highly compressed and oblong. Head large. Eyes large. Caudal fin forked. Barbels absent. Lateral line missing. Body is silvery white in colour.
Fin formula-D₁.14; P₁. 14; P₂. 7; A. 18. C. 19

Family- Engraulidae

7. *Setipinna phasa*: (Local name: Salo) - Body elongate, compressed. Head short compressed. Eyes large. Lips thin. Upper surface of body greyish silvery and abdomen silvery white. Dorsal fin is light yellow in colour, anal and caudal fin light greyish silvery in colour, edge of caudal fin blackish. Lateral line discontinuous. Anal fin long. No barbels. Caudal fin slightly forked.
Fin formula-D₁.11; P₁. 13; P₂. 6; A. 57; C. 19

III. ORDER – CYPRINIFORMES

Family – Cyprinidae

8. *Amblypharyngodon mola*: (Local name: Mowa) – Body highly elongate, head little compressed, Eyes large and centrally placed. Barbels absent. Lateral line incomplete. Body colour silvery grey. A light silver colour lateral band running from head to tail. Caudal deeply forked.
Fin formula-D₁.9; P₁. 15; P₂. 9; A. 7; C. 17
9. *Aspidoparia jaya*: (Local name: Boirali) - Body elongate and cylindrical. Barbels absent. Lateral line concave. Lips thin. Eyes medium in size. Caudal fin forked. Body colour light gray and yellows.
Fin formula-D₁.9; P₁. 15; P₂. 9; A. 9; C. 16
10. *Aspidoparia jaya*: (Local name: Boirali) - Body elongate and cylindrical. Barbels absent. Lateral line concave. Lips thin. Eyes medium in size. Caudal fin forked. Body colour light silvery and edge of fins are light yellow in colour.
Fin formula-D₁.9; P₁. 14; P₂. 9; A. 9; C. 14
11. *Barilius barila*: (Local name: Piali) - Body moderately elongate, sub-cylindrical and compressed. Abdomen rounded. Eyes large in size. Lateral line present. Lips very thin. Body colour silvery white. 15 vertical bars extending from back to lateral line. Barbels absent. Caudal fin forked.
Fin formula-D₁.6; P₁. 11; P₂.7; A. 8; C. 20
12. *Barilius barna*: (Local name: Piali) - Body moderately elongate, sub-cylindrical and compressed. Abdomen rounded. Eyes large. Lips thin. Body colour light grayish. 9 vertical bars, extending from back to lateral line. Lateral line discontinuous. Barbels absent. Caudal fin forked.
Fin formula-D₁.7; P₁. 10-11; P₂.6-8; A. 8; C. 18-20
13. *Barilius bendelisis*: (Local name: Piali) - Body elongate and compressed. Mouth moderate, two short pairs of barbels present. Eyes large. Barbels absent. Body colour light silvery white. 7 vertical bars extending from back to lateral line. Lateral line discontinuous. Caudal fin forked.
Fin formula-D₁.9; P₁. 12-13; P₂.9-10; A. 9; C. 18-20
14. *Barilius vagra*: (Local name: Piali) - Body elongate and compressed. Mouth moderate, two short pairs of barbels present. Eyes large. Barbels absent. Body colour silvery. 9-11 vertical black cluster present from back to lateral line. Lateral line discontinuous. Caudal fin forked.
Fin formula-D₁.10; P₁. 11; P₂.9; A. 9; C. 19

15. *Cirrhinus mrigala*: (Local name: Mirika) – Body elongated and compressed. Head short. Abdomen rounded. Two pairs of nostril pores present. Lateral line complete. Eyes large. Colour of pectoral, pelvic and anal fins are bright orange. Caudal fin forked.
Fin formula-**D₁.15; P₁. 17; P₂.9; A. 8; C. 15**
16. *Brachydanio rerio*: (Local name: Darikona) - Mouth oblique. Eyes small. Barbel two pairs. Dorsal fin situated nearer to the caudal fin than the snout. Lateral line absent. Four longitudinal blue bands on body and its separated by three narrow silver strikes. Also three blue bands produced along caudal fin. Anal fin also with three blue bands. Caudal fin forked.
Fin formula-**D₁.6; P₁. 13; P₂.6; A. 11; C. 18-21**
17. *Esomus danricus*: (Local name: Darikona) - Body elongate and compressed. Abdomen rounded. Head pointed and mouth upwards. A broad lateral band from snout to base of caudal fin. Two pairs of barbels present. Eyes large. Upper part of body olive green and rest part of body yellowish in colour. Caudal fin forked.
Fin formula-**D₁.8; P₁. 11; P₂.7; A. 8; C. 19- 22**
18. *Rasbora daniconius*: (Local name: Darikona) – Body elongated compressed. Abdomen rounded. Eyes large. Lips thin. Barbles absent. A black colour band from head to anal fin. Caudal fin forked. Upper part of body olive green and rest part of body light yellowish in colour.
Fin formula-**D₁.9; P₁. 14; P₂.9; A. 7; C. 17- 19**
19. *Danio dangila*: (Local name: Darikona) - Body elongated, sub-cylindrical and compressed. Abdomen rounded. Eyes large. Lips thin. Barbles absent. Body is dark blue colour with light golden blotch. Caudal fin forked.
Fin formula-**D₁.11; P₁. 13; P₂.8; A. 12; C. 18**
20. *Devario devario*: (Local name: Darikona) - Body elongated and compressed. Mouth small. Barbels absent. Lateral line complete. Body colour silvery yellows on below and greenish on back. A pair of prominent longitudinal bluish green band on the posterior half of the body.
Fin formula-**D₁.15; P₁. 12; P₂. 8; A. 16; C. 19**
21. *Garra lamta*: (Local name: Silkamura) – Body short, sub cylindrical, ventral surface flat. Head slightly depressed anteriorly. Eyes medium. Lips thick. Caudal fin slightly emarginated. Two pairs of barbels present. Lateral line complete.
Fin formula-**D₁.11; P₁. 10; P₂.8; A. 7; C. 18- 20**
22. *Garra gotyal*: (Local name: Silkamura) – Body short, sub cylindrical, ventral surface flat. Head slightly depressed anteriorly. Two pairs of barbels present. Eyes medium. Lips thick. Caudal fin slightly emarginated. Lateral line complete.
Fin formula-**D₁.10; P₁. 15; P₂.9; A. 7; C. 17**
23. *Garra nasuta*: (Local name: Silkamura) – Body short, sub cylindrical, ventral surface flat. Head slightly depressed anteriorly. Eyes medium. Lips thick. Caudal fin slightly emarginated. Lateral line complete. Two pairs of barbels present. Body is olive black in colour.
Fin formula-**D₁.11; P₁. 12; P₂.8; A. 9; C. 17**
24. *Labeo bata*: (Local name: Bhagon) – Body elongated, abdomen rounded. Eyes large, lips thin. A pair of short maxillary barbels present. Body colour light darkish or bluish above and silvery below. Lateral line discontinuous. Caudal fin forked.
Fin formula-**D₁.11; P₁. 16; P₂.9; A. 7; C. 15**
25. *Labeo calbasu*: (Local name: Bai) – Body elongated, abdomen rounded. Eyes large, lips thin. Body colour blackish-grey, lighter in ventral side. Lateral line discontinuous. Caudal fin deeply forked. Lips thick. Two very small pairs of barbels present.
Fin formula-**D₁.17; P₁. 16; P₂.9; A. 7; C. 16**
26. *Labeo gonius*: (Local name: Kuiha) – Body elongated, abdomen rounded dorsal part of body is convex. Eyes large, lips thin. Two pairs of short maxillary and rostral barbels present. Body colour greenish on back and silvery below. Lateral line discontinuous. Caudal fin deeply forked.
Fin formula-**D₁.17; P₁. 14; P₂.9; A. 7; C. 17**
27. *Osteobrama cotio*: (Local name: Haffo) – Body short, deep and compress. Mouth small. Barbels absent. Body colour silvery white. Lateral line present. Caudal fin deeply forked. Eyes large. Head short.
Fin formula-**D₁.10; P₁. 14; P₂.10; A. 32; C. 15**
28. *Puntius conchoni*: (Local name: Puthi) – Body short and compressed. Abdomen rounded. Head short. Eyes moderate. Lips thin. Barbels absent. Lateral line incomplete. Caudal fin forked. Body colour back shining olive green. A black spot before caudal fin.
Fin formula-**D₁.11; P₁. 13; P₂.9; A. 7; C. 19**
29. *Puntius gelius*: (Local name: Puthi) – Body elongate, mouth moderate. Barbels absent. Dorsal fin situated slightly in advance of opposite of pelvic fin origin. Lateral line incomplete. Body reddish yellowish brown. A black band to a little anterior to base of caudal fin. A deep black large spot at root of dorsal fin, small black spots at base of anal fin. Caudal fin forked.
Fin formula-**D₁.10; P₁. 14; P₂.9; A. 8; C. 17**
30. *Puntius phutunio*: (Local name: Puthi) – Body compressed. Eye large, mouth small. Barbels absent. Lateral line incomplete. Body greenish, yellowish and silvery. Two distinct vertically elongated comparatively broad bands on body, one from back to middle of pectoral fin and another from back to posterior end of anal base. Caudal fin forked.
Fin formula-**D₁.10; P₁. 13; P₂.8; A. 7; C. 16-18**
31. *Puntius sarana*: (Local name: Seni Puthi) – Body deep, moderately compressed. Lateral line complete. Color slightly darker on back and yellowish white on belly. Two pairs of small barbels present. Eyes large. Tip of the tail is black, opercula with black shot. Caudal fin forked.
Fin formula-**D₁.9; P₁.12; P₂.9; A.7; C. 17**
32. *Puntius sophore*: (Local name: Puthi) - Body moderately compressed and deep. One pair short maxillary barbels present. Body silvery, opercula with slightly dark orange grey. Eyes large in size. A dark spot at the base of dorsal fin rays and also a dark black spot nearer caudal fin. Lateral line complete. Caudal fin forked.
Fin formula-**D₁.11; P₁.14; P₂.9; A.8; C. 21**
33. *Puntius ticto*: (Local name: Puthi) - Body elongate and compressed. Scales medium, lateral line complete. Body colour silvery white. Two black spots on lateral line. Smaller one near commencement of lateral line and bigger one behind base of anal fin. One pair short maxillary barbels present. Caudal fin forked.
Fin formula- **D₁.11; P₁.13; P₂.9; A.7; C. 20**
34. *Puntius terio*: (Local name: Puthi) - Body elongated and compressed. Mouth moderate. Barbels absent. A large silvery black blotch at the middle over anal fin. And a black spot near the opercula. Caudal fin forked.
Fin formula-**D₁.11; P₁.15; P₂.9; A.8; C. 17**
35. *Securicula gora*: (Local name: Chela) - Body elongated, compressed. Head moderate and long. Eyes large. Dorsal fin very short. Body colour bright silvery. Lips thin. Lateral line present. Caudal fin slightly emarginate of

furcate.

Fin formula-D₁.10; P₁. 13; P₂.8; A. 15; C. 16

36. *Salmophasia phulo*: (Local name: Chela) – Body elongated and compressed. Eyes large. Lips thin. Dorsal fin short and nearer to anal fin. Lateral line complete. Pectoral line complete. Body colour bright silvery. Base of anal, pelvic and caudal fin is light pale yellow in colour.

Fin formula-D₁. 8; P₁. 11-13; P₂.7-8; A. 15; C. 16

37. *Tor putitora*: (Local name: Jonga tora pithia) – Body is elongated and dorsal and ventral side straight and compressed. Two pairs of barbels present. Mouth small. Caudal fin deeply forked. Body colour bright golden yellowish.

Fin formula-D₁. 9; P₁. 15; P₂.9; A. 5; C. 21

Family – Balitoridae

38. *Acanthocobitis botia*: (Local name: Kukur botia) - Body elongated, laterally compressed. Abdomen rounded. Ventral profile flat. Eyes small. 3 pairs of barbels present. Body colour is olivaceous. 6 ">" shaped bands on caudal fin.

Fin formula-D₁. 13; P₁. 10; P₂.8; A. 6; C. 23

39. *Schistura corica*: (Local name: Boirali) - Body is moderately compressed. Mouth is semicircular. Caudal fin slightly emarginate. 3 pairs of barbels presents. 10-12 black blotches present along with lateral line. Eyes moderate.

Fin formula-D₁. 11; P₁. 12; P₂.6; A. 6; C. 17

Family- Cobitidae

40. *Botia derio*: (Local name: Rani botia) – Body elongated, laterally compressed. Abdomen rounded. Mouth small and situated ventral part of the body. Four pairs of barbels present". Eyes are large. Anal fin is short. Six or Seven are yellowish vertical bands on the body. Caudal fin deeply forked. Lateral line is present.

Fin formula-D₁. 11; P₁. 14; P₂.7; A. 6; C. 23

41. *Botia dayi*: (Local name: Botia) – Body elongated, laterally compressed. Head long, pointed. Abdomen rounded. Mouth small and situated ventral part of the body. Lateral line is present. Four pairs of barbels present". Eyes are large. Anal fin is short. Caudal fin deeply forked. Mouth small. Whole body reticulated with dark brown bands which enclose different sizes yellowish spots.

Fin formula-D₁. 12; P₁. 14; P₂.8; A. 7; C. 21

42. *Lepidocephalichthys guntea*: (Local name: Botia) – Body elongated with laterally compressed. Abdomen rounded. Eyes small. Lips thick 3 pairs of barbels present. Caudal fin cut square with round corner. Lateral line present. A light gray and dark black spot line starting behind from pectoral fin to at base of caudal fin.

Fin formula-D₁. 8; P₁. 8; P₂.7; A. 6; C. 16

IV. ORDER – SILURIFORMES

Family – Bagridae

43. *Sperata seenghala*: (Local name: Aarii) – Body elongate, head large. Lips thin. Eyes large. Four pairs of barbels present. Caudal fin deeply forked. Body colour combined with silvery, black and light pinkish brown. Lateral line complete.

Fin formula-D₁.6; P₁. 9; P₂.5; A. 11; C. 18

44. *Sperata aor*: (Local name: Aarii) – Body elongate, head large. Lips thin. Eyes large. Four pairs of barbels present. Caudal fin deeply forked. Body colour combined with

silvery, black and light pinkish brown. Lateral line complete. Body colour bluish above, whitish below.

Fin formula-D₁.7; P₁. 9; P₂.5; A. 12; C. 18

45. *Hemibagrus menoda*: (Local name: Gagol or Boga singora) – Body short and moderately elongated. Head depressed and flattened from ventral side. Adipose dorsal fin long. Lateral line complete. Four pairs of barbels present". Eyes large. Body colour yellowish and dark grey. Caudal fin deeply forked.

Fin formula-D₁. 8; P₁. 9; P₂.5; A. 8; C. 21

46. *Mystus tengara*: (Local name: Signora) – Body short and elongated. Head short and flattened. Eyes medium in size. Lateral line complete. A black spot on shoulder. Adipose dorsal fin short. 4 yellowish and light metallic black longitudinal bands present in body. 3 pairs of barbels present". Caudal fin forked.

Fin formula-D₁. 7; P₁. 8; P₂.6; A. 13; C. 19

47. *Mystus vittatus*: (Local name: Singora) – Body short and elongated. Head short and flattened. Eyes medium in size. Lateral line complete. Adipose dorsal fin short. A black spot on shoulder. 2 light metallic black longitudinal bands present in body. 3 pairs of barbels present". Caudal fin forked.

Fin formula-D₁. 7; P₁. 9; P₂.6; A. 11; C. 17-20

48. *Rita rita*: (Local name: Ritha) – Body short, head large, depressed. 3 pairs of barbels present". Eyes medium in size. Dorsal spine strong, adipose fin short. Caudal fin forked. Body colour grayish-brown.

Fin formula-D₁. 7; P₁. 11; P₂.7; A. 12; C. 17-19

Family- Clariidae

49. *Clarias batrachus*: (Local name: Magur) - Body elongate, compressed. Head depressed. Eyes small. Four pairs of barbels present. Caudal fin rounded. Body colour brown to blackish. Pectoral spine strong, no spine on dorsal fin. Body colour grayish- brown.

Fin formula-D₁. 67; P₁. 10; P₂.6; A. 52; C. 16

50. *Heteropneustes fossilis*: (Local name: Singee) - Body elongate, compressed. Head depressed. Mouth small, four pairs of barbels present. Eyes small. Dorsal fin small, pectoral fin with a strong spine. Caudal fin rounded. Body colour reddish brown.

Fin formula-D₁. 6; P₁. 7; P₂.6; A. 68; C. 18

Family- Siluridae

51. *Ompok pabo*: (Local name: Pavo) - Body elongate and compressed. Abdomen rounded. Head small. Mouth large. Barbels two pairs. Anal fin long. Caudal fin deeply forked. Colour silvery-grey above and lighter below. A dark spot on shoulder. Lateral line complete.

Fin formula-D₁. 5; P₁. 14; P₂.9; A. 67; C. 17

52. *Ompok bimaculatus*: (Local name: Pavo) - Body elongate and compressed. Abdomen rounded. Head small. Mouth large. Colour silvery above and whitish below. Caudal fin deeply forked. Lateral line complete.

Fin formula-D₁. 4; P₁. 12; P₂.8; A. 71; C. 19

53. *Wallago attu*: (Local name: Borali) - Body elongate and compressed. Eye small. Mouth wide. Lips thin. Lateral line complete. Barbels two pairs. Dorsal fin short, no spine, pectoral fin with a spine. Anal fin long and extends to caudal fin. Caudal fin forked. Body colour silvery white.

Fin formula-D₁. 5; P₁. 14; P₂.10; A. 87; C. 21

Family – Schilbeidae

54. *Ailia Coila*: (Local name: Kajoli) – Body elongated and

compressed. Adipose dorsal fin very small. Lateral line complete. Eyes small. Lips thin. Caudal fin forked with black edge. Barbels four pairs. Body colour silvery white. Fin formula-**D₁.0; P₁. 13; P₂.5; A. 73; C. 23**

55. *Eutropiichthys vacha*: (Local name: Vacha) - Body elongate and compressed. Mouth large. Eyes large. Lateral line complete. Lips thin. Dorsal spine small. Barbels four pairs. Caudal fin deeply forked. Body colour grayish white.

Fin formula-**D₁.7; P₁. 14; P₂.5; A. 49; C.19**

56. *Neotropius atherinoides*: (Local name: Bordiya) – Body elongated, compressed. Abdomen rounded. Head small. Mouth wide. Lips thin. Eyes large. Four pairs of barbels present. Colour silvery and olive greenish on back, 4 longitudinal bands from opercula region to base of caudal fin. A black spot on base of caudal fin. Caudal fin forked.

Fin formula-**D₁. 5; P₁. 7; P₂.5; A. 32; C.16**

Family – Sisoridae

57. *Gagata cenia*: (Local name: Kyaketta) – Body elongate, compressed and flattened on ventral surface. Eyes large. Barbels four pairs. Dorsal and pectoral spine present. Adipose dorsal fin small. Lips thick. Lateral line complete. Caudal fin forked. Colour golden yellowish, 5-6 dark bands along dorsal surface.

Fin formula-**D₁. 6; P₁. 8; P₂.5; A. 10; C.19**

58. *Bagarius bagarius*: (Local name: Gorua) – Body and abdomen elongate. Head broad. Mouth terminal. Eyes small. Lips thick. Teeth sharp and unequal. Four pairs of barbels present. Caudal fin forked. Anal fin short. Body colour olivaceous and dark brown.

Fin formula-**D₁. 6; P₁. 13; P₂.6; A. 12; C.16**

Family – Chacidae

59. *Chaca chaca*: (Local name: Kurkuri) – Body is squarish size anteriorly broad and strongly depressed. Head large, mouth wide. Barbels three pairs. Dorsal spine and pectoral spine strong. Body covered with tubercles. Body colour dark brownish grey. Small black spots present in fin and whole body.

Fin formula-**D₁. 4; P₁. 5; P₂.6; A. 10; C.24**

V. ORDER – BELONIFORMES

Family – Belonidae

60. *Xenentodon cancila*: (Local name: Kokila) – Body elongate, compressed, cylindrical, tapering to both ends. Abdomen rounded. Head pointed. Snout sharply pointed. Mouth superior. Eyes large. Caudal fin forked. Body olive greenish in dorsally, white ventrally and white silvery laterally. Lateral line complete.

Fin formula-**D₁. 18; P₁. 10; P₂.6; A. 17; C.16**

VI. ORDER - CYPRINODONTIFORMES

Family – Aplocheilidae

61. *Aplocheilus panchax*: (Local name: Upor Choukha) – Body elongated and compressed. Dorsal surface of body flattened. Abdomen rounded. Lips thin. Eyes small. Lateral line absent. Barbels absent. Upper surface of body olive greenish coloured. Fins yellowish. A bright silvery spot on present in the head surface. Caudal fin oval in shaped.

Fin formula-**D₁. 6; P₁. 13; P₂.6; A. 16; C.16**

VII. ORDER – SYNBRANCHIFORMES

Family – Synbranchidae

62. *Monopterusuchia*: (Local name: Cucia) - Body elongate

and cylindrical. Tail compressed, tapering. Abdomen rounded. Mouth wide. Whole body is covered by scale. Eyes small. Lateral line conspicuous. Caudal fin hardly conspicuous. Body is dark brown in colour.

Fin formula-**D₁.0; P₁. 0; P₂.0; A. 0; C.0**

Family - Mastacembelidae

63. *Mastacembelus armatus*: (Local name: Bami) - Body elongated, compressed and pointed. Eyes small. Lips thin. Dorsal part of body is grey and brown colour. Anal and dorsal fin is spotted with black grey colour. Lateral line present and continuous.

Fin formula-**D₁. 79; P₁. 24; P₂.0; A. 77; C.16**

64. *Macragnathus pancalus*: (Local name: Turi) – Body eel-like elongated, long and pointed. Eyes small. Lips thin. Lateral line complete. Dorsal surface of body is olive green in colour. Ventral surface is light pale yellow in colour. Whole body is covered with numerous light black grey colour spot. Caudal fin rounded.

Fin formula-**D₁. 41; P₁. 18; P₂.0; A. 45; C.13**

65. *Macragnathus aral*: (Local name: Turi) – Body eel-like elongated, long and pointed. Eyes small. Lips thin. Lateral line complete. Two broad bands present from head to base of the caudal fin, one line is above the lateral line and another is below the lateral line. 4 small eyespots on base of dorsal fin.

Fin formula-**D₁. 46; P₁. 23; P₂.0; A. 51; C.16**

VIII. ORDER – PERCIFORMES

Family – Chandidae

66. *Chanda nama*: (Local name: Chanda) – Body ovate, deep, Body transparent and compressed. Abdomen rounded. Eyes large. Lips thin. Body colour yellowish white. A broad silvery stripe along body. Lateral line complete. Caudal fin deeply forked.

Fin formula-**D₁. 16; P₁. 11; P₂.5; A. 16; C.23**

67. *Parambassis baculis*: (Local name: Chanda) – Body elongated compressed and transparent. Abdomen rounded. Head short. Mouth large. Eyes large. Lips thin. Caudal fin forked. Lateral line complete. Body light yellowish olive green dorsally and light silvery white in ventrally. Light black dusky spot over the body.

Fin formula-**D₁. 11; P₁. 11; P₂.5; A. 14; C.22-24**

68. *Parambassis lala*: (Local name: Ronga chanda) – Body elongated compressed and transparent. Abdomen rounded. Head short. Mouth large. Eyes large. Lips thin. Caudal fin forked. Lateral line complete. Edge of first dorsal and anal fin blackish. Body colour orange red. Three vertical dark black bands on the body.

Fin formula-**D₁.11; P₁. 10; P₂.5; A. 12-13; C.21-23**

69. *Parambassis ranga*: (Local name: Dangor chanda) – Body elongated compressed and transparent. Abdomen rounded. Head short. Mouth large. Eyes large. Lips thin. Caudal fin forked. Lateral line complete. Body colour is light silvery white. Light black dusky spot over the body. A dark black spot near the spine of first dorsal fin.

Fin formula-**D₁. 13; P₁. 12; P₂.5; A. 12-13; C.22**

Family – Nandidae

70. *Nandus nandus*: (Local name: Khaloivangi) – Body oblong, compressed. Abdomen rounded. Head large, compressed. Mouth large. Eyes large. Caudal fin rounded. Lateral line discontinuous. Body colour dark greenish black and brown. 3-4 vertical dark greenish black band on the body. Anal fin with 3 spines.

Fin formula-**D₁. 12; P₁. 14; P₂.7; A. 8; C.16**

71. *Badis badis*: (Local name: Randhani) – Body moderately elongated and compressed. Eyes large. Abdomen rounded. Head small. Lips thin. Lateral line present but discontinuous. Caudal fin rounded. Body colour variable with different habitat, but generally brownish black colour.

Fin formula-**D₁. 9; P₁. 13; P₂.5; A. 7; C.14**

72. *Badis assamensis*: (Local name: Randhani) – Body moderately elongated and compressed. Eyes large. Abdomen rounded. Head large. Lips thin. Lateral line present. Caudal fin rounded. Body colour mixture with black and dark grey. Bluish black spot at base of caudal and anal fin. A bluish black spot on operculum.

Fin formula-**D₁. 9; P₁. 13; P₂.5; A. 7; C.13**

Family – Gobiidae

73. *Glossogobius giuris*: (Local name: Patimutura) – Body elongated and cylindrical from posterior part. Head pointed. Caudal fin rounded. Anal fin short. Body colour olive green and light pale yellowish. Lateral line present.

Fin formula-**D₁. 6; D₂. 9 P₁. 18; P₂.8; A. 8; C.16**

74. *Glossogobius gutum*: (Local name: Patimutura) – Body elongated and cylindrical from posterior part. Head pointed. Caudal fin rounded. Anal fin short. Body colour olive green and light pale yellowish. Lateral line present. Base of the caudal fin is yellowish in colour. Blackish mark on the head.

Fin formula-**D₁. 6; D₂. 10 P₁. 16; P₂.9; A. 8; C.15**

Family – Anabantidae

75. *Anabas testudineus*: (Local name: Kawoi) – Body oblong, compressed. Abdomen rounded. Eyes large. Two lateral line present. Lips thin. Caudal fin rounded. Dorsal half of the body is dark grey in colour. And almost from lateral line is light yellowish olive green in colour. Caudal, anal, pelvic and pectoral fin is light pale yellowish in colour.

Fin formula-**D₁. 9; P₁. 15; P₂.5; A. 10; C.17**

Family – Belontiidae

76. *Colisa fasciata*: (Local name: Kholihona) – Body oval, Compressed. Snout blunt. Mouth upturn and small. Eyes large. Lips thin. Caudal fin slightly emarginated and truncate. Lateral line present but discontinuous. 14 light bluish vertical bands present from base of dorsal part to base of ventral side. Dorsal, anal and caudal fins with minute red spots. It maximum length up to 10 cm.

Fin formula-**D₁. 13; P₁. 10; P₂.1; A. 17; C.16**

77. *Colisa labiosus*: (Local name: Kholihona) – Body oval, Compressed. Snout blunt. Mouth upturn and small. Eyes large. Lips thin. Caudal fin rounded. Lateral line present but discontinuous. 8 dark bluish vertical bands present from base of dorsal part to base of ventral side. Dorsal, anal and caudal fins with minute red spots.

Fin formula-**D₁. 16; P₁. 9; P₂.1; A. 15; C.15**

78. *Colisa lalia*: (Local name: Ronga Kholihona) – Body oval, Compressed. Snout blunt. Mouth upturn and small. Eyes large. Lips thin. Caudal fin rounded. Lateral line present but discontinuous. It is most colorful of all other *Colisa sp.* Which are found in Assam 12 dark metallic bluish vertical bands present from base of dorsal part to base of ventral side. Dorsal, anal and caudal fins with red spots. It maximum length up to 5 cm.

Fin formula-**D₁. 10; P₁. 8; P₂.1; A. 17; C.16**

79. *Colisa sota*: (Local name: Beshu) – Body oblong and compressed. Mouth small. Eyes large. Lateral line present. Caudal fin slightly emarginate. Body colour dull olive green above light brownish below. A single black longitudinal band from eye to base of the caudal fin. Dorsal, caudal and anal fins are light brown colour.

Fin formula-**D₁. 8; P₁. 8; P₂.1; A. 12; C.15**

Family – Channidae

80. *Channa gachua*: (Local name: Cheng) – Body elongated, sub cylindrical anteriorly. Abdomen rounded. Head large and depressed. Mouth large. Dorsal fin long, inserted almost above the pectoral fins. Anal fin also long. Lateral line incomplete. Caudal fin rounded. Edge of caudal rounded with orange bar. Length up to 18 cm. dorsal side of the body with light black grey. Ventral side of body bluish in colour.

Fin formula-**D₁. 32; P₁. 14; P₂.6; A. 22; C.14**

81. *Channa marulius*: (Local name: Sal) – Body elongated, sub cylindrical anteriorly. Abdomen rounded. Head large and depressed. Mouth large. Dorsal fin long, inserted almost above the pectoral fins. Anal fin also long. Lateral line incomplete. Caudal fin rounded. Edge of caudal eyes spot present. Length up to 80 cm. Body colour grey-green or black-green. Ventral side of the body light cream and olive colour.

Fin formula-**D₁. 54; P₁. 19; P₂.6; A. 34; C.17**

82. *Channa punctatus*: (Local name: Goroi) – Body elongated, sub cylindrical anteriorly. Abdomen rounded. Head large and depressed. Mouth large. Dorsal fin long, inserted almost above the pectoral fins. Anal fin also long. Lateral line incomplete. Caudal fin rounded. Body colour varies habitat. Usually grey on dorsal side and pale light yellow and white on ventral side. 7-8 vertical bands dark bands on body. Length up to 25-28 cm.

Fin formula-**D₁. 34; P₁. 15; P₂.6; A. 21; C.15**

83. *Channa striatus*: (Local name: Sol) – Body elongated, sub cylindrical anteriorly. Abdomen rounded. Head large and depressed. Mouth large. Dorsal fin long, inserted almost above the pectoral fins. Anal fin also long. Lateral line incomplete. Caudal fin rounded. Two pale vertical bands at the base of caudal fin. Black-green on dorsal side and light cream and olive ventral side.

Fin formula-**D₁. 46; P₁. 17; P₂.6; A. 26; C.17**

84. *Channa stewartii*: (Local name: Senar) – Body elongated, sub cylindrical anteriorly. Abdomen rounded. Head large and depressed. Mouth large. Dorsal fin long, inserted almost above the pectoral fins. Anal fin also long. Lateral line incomplete. Caudal fin rounded. Usually light grayish on dorsal side and grayish white on ventral side.

Fin formula-**D₁. 39; P₁. 17; P₂.6; A. 27; C.18**

IX. ORDER – TETRAODONTIFORMES

Family – Tetraodontidae

85. *Tetraodon cutcutia*: (Local name: Gangatop) – Body globe shaped. Abdomen rounded. Head oval shaped. Eyes large. Lips thick. Caudal fin emarginate. Pelvic fin absent. Lateral line present. End of caudal fin red. Body colour on dorsal side is olivaceous green. Different black marking present in whole body.

Fin formula-**D₁. 10; P₁. 21; P₂.0; A. 12; C.7**



Fig 2: *Chitala chitala*



Fig 8: *Aspidoparia jaya*



Fig 3: *Notopterus notopterus*



Fig 9: *Aspidoparia morar*



Fig 4: *Pisodonophis boro*



Fig 10: *Barilius barila*



Fig 5: *Gudusia chapra*



Fig 11: *Barilius bendelisis*



Fig 6: *Setipinna phasa*



Fig 12: *Brachydanio rerio*



Fig 7: *Amblypharyngodon mola*



Fig 13: *Esomus danricus*



Fig 14: *Rasbora daniconius*



Fig 20: *Labeo bata*



Fig 15: *Danio dangila*



Fig 21: *Labeo calbasu*



Fig 16: *Devario devario*



Fig 22: *Labeo gonius*



Fig 17: *Garra lamta*



Fig 23: *Osteobrama cotio*



Fig 18: *Garra gotyla*



Fig 24: *Puntius phutunio*



Fig 19: *Garra nasuta*



Fig 25: *Puntius conchonius*



Fig 26: *Puntius sarana*



Fig 27: *Puntius gelius*



Fig 28: *Puntius sophore*



Fig 29: *Salmostoma bacaila*



Fig 30: *Securicula gora*



Fig 31: *Acanthobotia botia*



Fig 32: *Schistura corica*



Fig 33: *Botia dario*



Fig 34: *Botia dayi*



Fig 35: *Lepidocephalichthys guntea*



Fig 36: *Mystus vittatus*



Fig 37: *Rita rita*



Fig 38: *Sperata seenghala*



Fig 44: *Neotropius atherinoides*



Fig 39: *Ompok bimaculatus*



Fig 45: *Gagata cenia*



Fig 40: *Ompok pabo*



Fig 46: *Clarias batrachus*



Fig 41: *Wallago attu*



Fig 47: *Heteropneustes fossilis*



Fig 42: *Ailia Coila*



Fig 48: *Chaca chaca*



Fig 43: *Eutropiichthys vacha*



Fig 49: *Xenentodon cancila*



Fig 50: *Aplocheilus pancha*



Fig 56: *Parambassis baculis*



Fig 51: *Macrognathus pancalus*



Fig 57: *Parambassis lala*



Fig 52: *Macrognathus aral*



Fig 58: *Nandus nandus*



Fig 53: *Mastacembelus armatus*



Fig 59: *Badis badis*



Fig 54: *Chanda nama*



Fig 60: *Trichogaster fasciata*



Fig 55: *Parambassis ranga*



Fig 61: *Trichogaster lalia*



Fig 62: *Trichogaster chuna*



Fig 63: *Channa punctatus*



Fig 64: *Channa striata*



Fig 65: *Channa gachua*

Species like *Schistura corica*, *Pisodonophis boro*, *Garra nasuta*, *Osteobrama cotio*, *Badis assamensis* and *Glossogobius gutum* very rarely reported in lower parts of Assam. While *Amblypharyngodon mola* *Barilius barna*, *Barilius bendelisis*, *Barilius vagra*, *Barilius barila*, *Danio dangila*, *Garra gotyla*, *Puntius conchoniis*, *Puntius sophore*, *Puntius ticto* *Lepidocephalichthys guntea*, *Mystus vittatus*, *Clarias batrachus*, *Heteropneustes fossilis*, *Aplocheilus panchax*, *Macrornathus aral*, *Macrornathus pancalus*, *Channa gachua* and *Channa punctatus* are mostly found in Manas national park and its adjacent villages. Due to inadequacy of previous information on ichthyofaunal diversity from Manas national park and its adjoining villages it is not possible to appraise the rate of decline in ichthyofaunal diversity, but the present study would be useful as criterion data for any future appraisal after interlinking.

4. Conclusion

Manas National park is gifted with immense resources of nature. Above results support that Manas national park and its adjoining areas not only holding an unique indigenous fresh

water ichthyofaunal diversity but also have a very good ecosystem; without a good ecosystem it is impossible to survive such a high fresh water indigenous ichthyospecies diversity under Manas National park and its adjacent villages.

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