CHAPTER VIII

SUMMARY
Majuli is one of the largest river islands of the world situated in the upper reaches of the river Brahmaputra in Assam. Geomorphologically, the Majuli Island forms a part of the flood plains of the Brahmaputra River. The island has large numbers of floodplain wetlands fed by two rivers namely the Brahmaputra and the Subansiri.

The work was started with the aim to record fish diversity in the water bodies of this island. The water bodies harbour ecologically and commercially important exploitable fish species. For study of diversity of fishes in the water bodies of the island 12 landing sites covering entire Majuli Island were selected. The island faces severe inundation during monsoon; more or less similar ecological conditions prevail in these water bodies. Therefore, two beels of the island were selected for continuous monitoring of seasonal variation of ecological parameters of the water. These two beels were selected because Kakarikata is fed by the river Brahmaputra and the Kharjan beel is fed by the river Subansiri which is a torrential river. The biodiversity study was important because there were only scattered reports available on fish diversity and due to severe erosion, striking of land mass and habitat degradation due to anthropogenic stress many ecologically important species may be decline in natural habitat.

From the recorded fish species in different habitats two loach species available throughout the year were selected for detailed study of biology. One species was *L. goalparensis* which is critically endangered (CR) as per CAMP (1998). This fish was recorded for the first time from Majuli and no biological data was available on this fish since its first description in 1976. The other fish selected for study of was *Botia dario* which is LRnt according to CAMP (1998) but detailed biology of the species was not done except available fecundity data from Bangladesh and length weight data (n = 32) from Barak valley, Assam.

A total of 82 species of fishes belonging to 54 genera, 23 families and 10 orders have been recorded from the landing sites of Majuli Island. Of the recorded species, 10 species were torrential species, 48 lotic water species and 24 species were from the lentic habitats. As per CAMP (1998), out of the 82 fishes, one species belong to critically endangered (CR), 6 species
endangered (EN) 18 species vulnerable (VU), 28 species lower risk near threatened (LRnt), 6 species lower risk least concern (LRlc), one species data deficient (DD) and the rest 22 species are yet to be evaluated for their conservation status. According to IUCN Red list of threatened species (2014), 68 species least concern (LC), one species in endangered (EN), one species vulnerable (VU), one species data deficient (DD), 9 species near threatened (NT) and rest 2 species are in not evaluated (NE) category.

Majuli Island has 12 registered and 66 unregistered beels. Two beels (Kakarikata and Kharjan beel) were selected to study the ecological parameters of the habitat. Certain abiotic parameters (temperature, $p^H$, dissolved oxygen, free carbon dioxide, total hardness and total alkalinity) and biotic parameters (phytoplankton and zooplankton) of water were studied for two years (2010 – 2012). During the investigation, the ecological parameters of the water of the two beels were within the same range.

The study of biology of the two species was done because one fish has been recorded from the island for the first time was *Lepidocephalichthys goalparensis*. No biological data on this fish was available since it was described in 1976. Another species was *Botia dario* where detailed biological data were not reported so far. A total of 434 specimens of *L.goalparensis* and 608 specimens of *B.dario* have been taken for detailed biological study.

In *L.goalparensis*, a total of 434 specimens were collected. The total length ranged from 4.0 – 6.3 in males and 4.8 – 6.2 cm in females. Sexual dimorphism is prominent. Males differ from the female due to the presence of lamina circularis in pectoral fin and length of pectoral fin is longer in males than in females. The length weight relationships (LWR) indicated negative allometric growth. The maximum relative condition factor (Kn) was recorded in August (1.296) in males and in June in females (1.411). From this it can be concluded that the fishes were in good condition. The sex ratio was significantly different from the expected 1:1 ratio throughout the year. The estimated data of gonadosomatic index (GSI), progression of ova diameter and monthly percentage of maturity stages indicated that spawning season extends from May to September. Absolute fecundity ranges from 1123 to 8389 and relative fecundity ranges from 927 to 5260. Fecundity is significantly ($P < 0.05$) correlated with total length, ovary length and highly significant ($P < 0.01$) correlation with the body weight and ovary weight.
From the study of gut content analysis and relative length of gut it has been observed that the species *L. goalparensis* is omnivorous in nature and presence of higher percentage of mud and detritus in the gut confirmed that fish is bottom feeder in nature.

The other species selected for detailed study was *B. dario*, out of 608 specimens recorded 353 (58.1%) are males and 255 (41.9%) are females. The estimated length weight relationships (LWR) indicated positive allometric growth. The condition factor (K) and relative condition factor (Kn) values were found to be more than one in both and male and females. The sex ratio (1: 0.72) was significantly different from the expected 1:1 ratio i.e. more males in all the months. Spawning season was estimated from April to August as GSI reached a peak in July for both males and females, larger sized ova was observed during April to August and maximum proportions of ripe gonads (Stage IV) were observed from April to August. Absolute fecundity ranged between 2523 - 51377 and relative fecundity ranged between 386 - 3203. Fecundity showed a highly significant (p < 0.001) correlation with total length, body weight and ovary weight of the fish.

The food items of the gut consist of higher percentage of insects, worms and crustaceans indicated that the fish is carnivorous in habit. Higher percentage occurrence of insects in the gut contents confirms that the fish is midfeeder in nature. While studying the food materials in the gut 9 (nine) water mite samples were recorded of which one species (*Torrenticola episce*) was reported as a new species and three species were reported for the first time from India (Pesic *et al.*, 2013).

The data generated from this study will help future workers to plan conservation measures for ecologically important species (*L. goalparensis* and *B. dario*) in the Majuli Island and will enrich the data base of fishes of the island.