

# Biodiversity of Freshwater Ecosystems

Threats, Protection, and Management



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## CHAPTER 1

# Freshwater Biodiversity: Importance, Threats, and Management

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### ABSTRACT

Freshwater biodiversity exhibits a wide variety of plants and animals. All of them are synchronously acting and contributing to different ecosystems linked with each other. Natural habitats within freshwater provide them with a place suitable to embellish their population and build harmonious communities. Every organism in an organization is essential to play a significant role at different trophic levels. Humans are directly dependent on freshwater for their daily needs and survival. Their daily needs for livelihood, sports, fishing, ultra-structured engineering, channelization, dam formation, etc., are fragmenting and devastating the natural habitat of freshwater organisms. As a result, most of the species are at risk of extinction and need particular conservation concerns. Recent data collected and analyzed by IUCN, postulate that most aquatic plants, microorganisms, molluscs, fishes, and amphibians are fighting critically for their survival. So, this is the time to think, decide, plan, and implement the conservational practices. Although the conservational strategies are being planned and executed for several decades and centuries, there is still some need to work efficiently and effectively. Management of them is critically essential to maintain biodiversity and sustain the Earth. Assessing the quality and traits by utilizing next-generation DNA sequencing plays a vital role in evaluating the cause of any change in animal physiology and behavior caused by stressors or mutations. Species richness can be maintained and improvised by a wide variety of parameters discussed in this chapter.

### 1.1 INTRODUCTION

Biodiversity exhibits all of the diverse living beings present on Earth, including the plants, animals, bacteria, fungi, or other living microorganism put together. There is a countless and rich biodiversity present on Earth, with most of them still discovered. Many of them are standing at the edge of extinction because of the malfunctioned human practices. Biodiversity act as a tool to define the variety of living being at genetic, species, and ecosystem level. Genetic diversity defines the diverse genetic makeup and phenotypic existence of the organisms. Species diversity defines the diversified species of different populations harboring an area. Ecological diversity shows the variations in the plant and animal species living together, their habitats, biological communities and their interactions through different ecological communications and energy cycles.