


Chapter 3

Restoration of Native Habitats Invaded by Invasive Plants Under Changing Climate

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ABSTRACT

This chapter explores the different strategies for restoring natural environments, highlighting the importance of management practices in considering future climate conditions. The main approaches involve excluding invasive species and restoring native and climate-resilient species to boost ecosystem stability. In addition to this, the chapter also focuses on the role of community and stakeholders' collaboration

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for restoration projects. This chapter discusses the need for constant monitoring and adaptable strategies to address climate change issues. It demands extensive research on the interactions between native and invasive flora in changing climate conditions. Generally, this chapter's objective is to train scientists and policymakers with the facts and tools necessary to restore natural ecosystems from climate change and invasive species, leading to the conservation of biodiversity and ecosystem resilience.

INTRODUCTION

Since 1900, global average surface temperatures have increased by 0.7 °C per century, with a more rapid rise of 0.16 °C per decade since 1970. This warming is primarily attributed to higher atmospheric concentrations of greenhouse gases due to anthropogenic activities (Bilgili, Tumse, & Nar, 2024). Temperature increases have been more pronounced during winter than summer and are mainly reflected in rising minimum temperatures. Changes in precipitation patterns have also been noted, though these shifts are moreover variable and less consistent than temperature changes (Gao et al., 2018). Even with conservative emission estimates, future climate projections indicate further warming, substantial drying in regions, and a rise in the intensity and frequency of extreme weather events. For instance, climate models suggest annual temperatures in the United States could increase by 3-9 °C over the next century, alongside dormant reductions in summer rainfall in certain areas (Jones et al., 2023).

Native to a particular area, invasive species are plants or animals that overrun a new ecosystem. Most often, humans plant them in new climates, either purposefully or inadvertently. An invasive alien species has been introduced to a new location and has started to cause problems in its new environment. These species threaten native biodiversity because they outcompete local species for resources, and they are spreading moreover quickly due to an increase in international travel and trade. A recent study found numerous biodiversity hotspots, and one-sixth of the Earth's land surface is particularly vulnerable to invasion (Smith, 2024). Taxa that endanger biological variety, food security, human health, and well-being when they are introduced and spread by human activity outside of their natural distribution. The term invasive denotes a species present outside of its native habitat. Invasive refers to a tendency to spread into and alter newly introduced habitats. As a result, a species can be invasive without being alien, or it can spread rapidly within a region and become foreign without actually being alien. The threat of invasive species (IS) to many ecosystems has spread worldwide. The escalating danger is causing great global anxiety and severe global activities and coverage through agreements, treaties, governments, and organizations (Dindaroglu, 2024).

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