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## Biological Diversity: Problems and Challenges

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## Chapter One

# MONITORING AND PROTECTING BIOTIC DIVERSITY

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## INTRODUCTION

Biological diversity is a topic of current interest in both the scholarly and popular press. Biologists, government agencies, and the general public debate definitions, sampling procedures, management and protection programs, and consequences of the loss of biodiversity. The destruction of centers of biodiversity, such as tropical moist forests, coral reefs, and wetlands, receives much attention. However, nearly all ecosystems are under environmental stress from human-caused phenomena, and some ecosystems almost have disappeared, such as vernal pools in California and the old growth coastal longleaf pine (*Pinus palustris*) forests of the southeastern United States. With the loss of each unique ecosystem, community, species, or population, the earth's biotic diversity decreases.

The goal of biodiversity monitoring and protection should be the maintenance of biotic communities and ecosystems rather than the protection of individual animals, plants, or even species. In this paper, the term biodiversity encompasses both the number of species within an area (species richness) and the number of individuals per species (species diversity), and includes only species normally found within an ecosystem in relatively undisturbed habitats. Other factors, such as the presence of exotic species (e.g., starlings, English sparrows, common carp, walking catfish, kudzu, and Russian thistle in North America) and fragmented ecosystems that lead to an increase in ecotonal habitats, can artificially increase

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