

# THEME 1

# WHAT IS A FOREST?

The concepts within this theme provide a fundamental knowledge of forests as ecosystems. Comprehending these concepts will facilitate a fundamental understanding of the relationship between forests and humans, and how forests make a difference in our lives.

## A. DEFINITION OF A FOREST

Defining what constitutes a forest is the first step in understanding forest resources:

1. Forests are ecosystems characterized by **tree cover** with different species, structure, composition, or age class. They commonly include streams, fish, and wildlife.
2. Forests are affected by **biotic factors** (e.g., plants, animals, humans) and **abiotic factors** (e.g., soils, nutrients, moisture, sunlight, climate).
3. Forests may be classified by the **dominant** tree species or combination of tree species present. Forests range in size from under an acre (hectare) to thousands of acres (hectares).
4. Forests can be public or private; geographically rural, suburban or urban; managed or unmanaged; and used for a wide variety of purposes.
5. Forests grow through natural **regeneration** or may be assisted through forestry practices (known as **silviculture**).
6. An urban forest is defined as all trees within a defined urban core boundary.

## B. TREES AS PART OF THE FOREST

A key defining characteristic of any forest is the trees within it. The following concepts help people appreciate the uniqueness of tree species and comprehend how individual trees function and interact in a forest ecosystem.

1. A tree is a woody **perennial** plant usually 12 feet (4 meters) or greater in height at maturity, often with a single main stem, and a more or less distinct crown of leaves, needles, or scales.
2. Trees have life stages that include germination, growth, maturity, reproduction, decline, and death.
3. Trees can be identified based on seeds, leaves, flowers, bark, shape and other parts. They can be classified into family, genus, and species groups.
4. Trees are broadly classified as **deciduous** (a tree that has leaves or needles that die and drop after one growing season), or coniferous (trees that retain their green leaves, needles, or scales for two or more growing seasons).
5. Trees experience primary and secondary growth. **Primary growth** results in an increase in root length and tree height. **Secondary growth** results in the increasing diameter of roots, branches, and stems.
6. As part of the forest ecosystem, trees have various roles. These roles include supplying oxygen, producing food, providing habitat for wildlife, stabilizing soil, moderating temperature, capturing and storing carbon, and cycling water and nutrients.
7. Forest health is affected by many factors, including natural competition (for space, light, water/moisture, and nutrients), natural disturbance, human interventions, pests, disease, and more.

## C. FORESTS AS ECOSYSTEMS

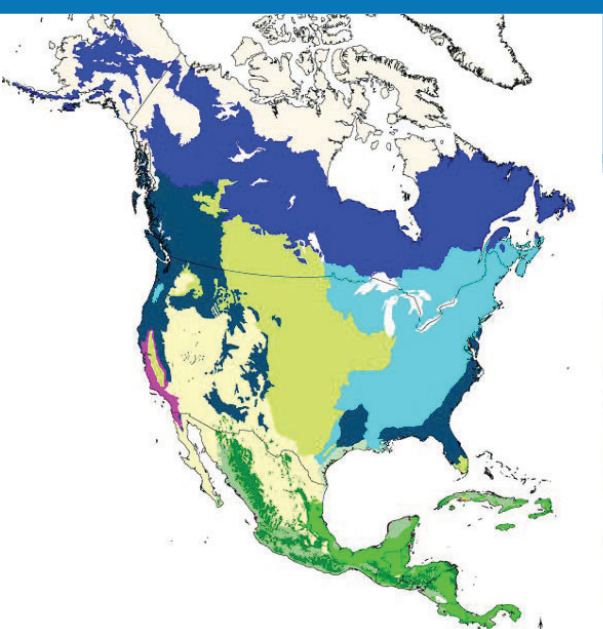
Trees and forests influence and are influenced by their surrounding environment. Understanding basic ecological principles and how they apply to forests helps people appreciate the characteristics of forest ecosystems.

1. Forest ecosystems consist of different types of **biotic** organisms (e.g., living things – producers, consumers, and decomposers) and abiotic components (e.g., non-living things – sunlight, soil, minerals, water) interacting within a given environment, space, and time.
2. Forests are interconnected with other terrestrial (e.g., rangeland) and aquatic (e.g., river, lake estuary) ecosystems, forming a larger system.
3. Forest ecosystems include processes such as **photosynthesis**, energy flow, and the cycling of nutrients, water, carbon, and other matter.
4. Forest ecosystems are complex and dynamic and continuously undergo natural change, adaptation, ranging from gradual change (e.g., **succession**, climate adaptation) to abrupt change (e.g., fire, disease).
5. Natural and human-caused disturbance events are a part of forest ecosystems. Examples of natural events include wildfires, storms, ice damage, insects, disease, and volcanic activity. Examples of human-caused events include accidental fires, forest management, road construction, introduction of non-native species, and development.

## D. FOREST CLASSIFICATION

Classifying and differentiating forests into biomes and types helps people understand the forests in their community, in their country, and around the world.

1. Forests are dynamic and always changing. Forces can include climate change, disturbance, species migration, and more.
2. Different forest **biomes** exist around the world. Examples include **tropical forests**, **temperate forests**, and **boreal forests**. In the United States, major forest biomes include temperate deciduous, tropical deciduous, temperate coniferous, and temperate rainforest. In Canada, the major biomes are boreal, montane, temperate deciduous, and temperate rainforest.
3. Many different forest types exist within a biome, typically distinguished by their dominant tree species. For example, there are oak-hickory forests, spruce-fir forests, loblolly pine forests, and many others. Forest types can be further broken down into more distinct natural communities that recur on the landscape, characterized by finer scale descriptions of vegetation, including shrubs and ground cover.
4. Across the globe, there is considerable variation in soil types, elevation, temperature, wind and precipitation patterns. These variations create the different forest types and associated plants and animals (**flora** and **fauna**) that, together with disturbance history and patterns, contribute to that region's biodiversity.
5. Humans are part of the forest ecosystem. They depend on and influence forest ecosystems and are also influenced by them.



## BIOMES OF NORTH AMERICA

