

Sustaining Terrestrial Biodiversity: The Ecosystem Approach

Chapter Ten

Public Lands in the U.S.

- 42% of U.S. lands is set aside for public use, enjoyment, and wildlife (73% of which is in _____).
- Multiple-Use Lands (National Forest System & National Resource Lands)
 - National Forest System operates on two principles
 - Principle of _____ yield: renewable resources should not be harvested faster than they are replenished
 - Principle of multiple use: land should be used simultaneously for a variety of uses

Types of Forests

- There are three general types of forests, depending on climate: Tropical, Temperate and Polar
- _____-Growth Forests are uncut forests and regenerated forests that have not been seriously disturbed for at least several hundred years
- _____-Growth Forests are stands of trees resulting from secondary ecological succession after cutting

Economic Importance of Forests

- Forests provide lumber for housing, biomass for fuelwood, pulp for paper, medicines, and many other products
 - Worldwide, 55% of the timber cut each year is used for _____ and cooking
 - The United States is the world's largest per capita importer of wood products. China is the largest overall importer.

Ecological Importance of Forests

- Forest watersheds filter and regulate flow of water from mountain highlands to croplands and urban areas
- Forests influence _____ (50-80% of atmospheric water vapor comes from trees via transpiration and evaporation)
- Forests are a critical component of the _____ cycle, taking up 90% of atmospheric carbon dioxide
- Forests provide more habitats for wildlife species than any other biome

Deforestation of Tropical Forests

- The lowest estimated rate of loss and degradation of remaining tropical forests is 25,000 square miles per year. This is equivalent to half the size of North Carolina.
- _____ causes include population growth, poverty and government policies
- _____ causes include roads, logging, farming, ranching, flooding from dams, mining, and oil drilling

Forest Management

- The two basic forest management systems
 - _____-aged management (or industrial forestry) is when trees are planted and maintained at about the same age and size using monoculture techniques to be harvested simultaneously
 - _____-aged management involves the planting of a variety of tree species at many ages for multiple uses. This increases the biodiversity of the area and creates a more stable environment

Tree Harvesting

- Loggers use various methods to harvest trees
- With selective cutting, intermediate-aged or mature trees are cut singularly or in small groups, creating gaps no bigger than the height of the standing trees
 - _____ is the selective cutting of the most valuable trees
- Shelterwood cutting removes all mature trees in two or three cuttings over a period of 10 years
- Seed-tree cutting harvests nearly all of a stand's trees in one cutting, leaving a few uniformly distributed seed-producing trees to regenerate the stand
- _____ - _____ is the removal of all trees from an area in a single cutting, increasing the timber yield.
- Strip-cutting is clear-cutting a strip of trees along the contour of the land, with a corridor narrow enough to allow natural regeneration.
- Whole-tree harvesting involves cutting trees at the ground level or uprooting entire trees to be placed in a chipping machine for use as pulpwood or fuelwood chips

Forests and Fire

- Intermittent natural fires are an important part of the ecological cycle of some types of forests
 - _____ fires usually burn only undergrowth and leaf litter on the forest floor
 - Crown fires may start on the ground but eventually burn whole trees and leap from treetop to treetop
- Protecting forest resources from fire can involve four approaches
 - Prevention
 - _____ burning: setting controlled ground fires to prevent buildup of flammable material
 - Presuppression: early detection and control of fires
 - Suppression: fighting fires once they have started

Sustainable Forestry

- Sustainable forest management emphasizes the following
 - Recycling more paper to reduce the harvest of _____
 - Practicing selective cutting of individual trees or small groups of most tree species
 - Minimizing _____ of larger blocks of forest
 - Minimizing soil erosion and compaction from road building and logging
 - Ban conventional clear-cutting
 - Leaving most standing dead trees and fallen timber to maintain diverse wildlife habitats
 - Include ecological and recreational services in determining _____ value

Grasslands

- After forests, the ecosystem most widely used and altered by humans are grasslands. Ecological services provided by grasslands include
 - _____ formation
 - erosion control
 - _____ cycling
 - storage of atmospheric CO₂
 - biodiversity maintenance

Rangelands

- Rangelands are unfenced grasslands in temperate and tropical climates that supply forage for grazing (grass-eating) and _____ (shrub-eating) animals.
- Overgrazing occurs when too many animals graze for too long and exceed the carrying capacity of a rangeland area. This leads to soil erosion and soil _____.

Ecosystem Approach

- The ecosystem approach encourages the protection of habitats and ecosystem services through a four-point plan.
 - Map global ecosystems and create an inventory of the species within and ecosystem services provided
 - Protect the most endangered ecosystems and _____
 - Restore degraded ecosystems
 - Encourage biodiversity-friendly _____