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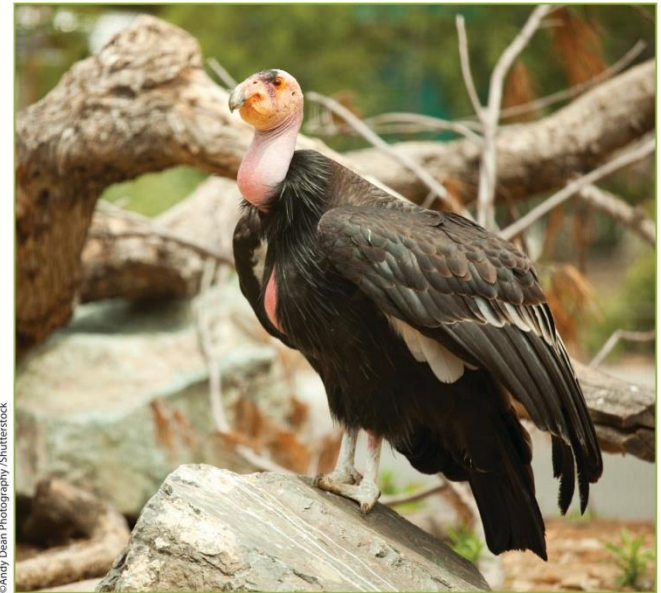
Land Resources

# Overview of Chapter 17

- Land Use
- Wilderness, Parks, and Wildlife Refuges
- Forests
- Rangeland and Agricultural Lands
- Wetlands and Coastal Areas
- Conservation of Land Resources

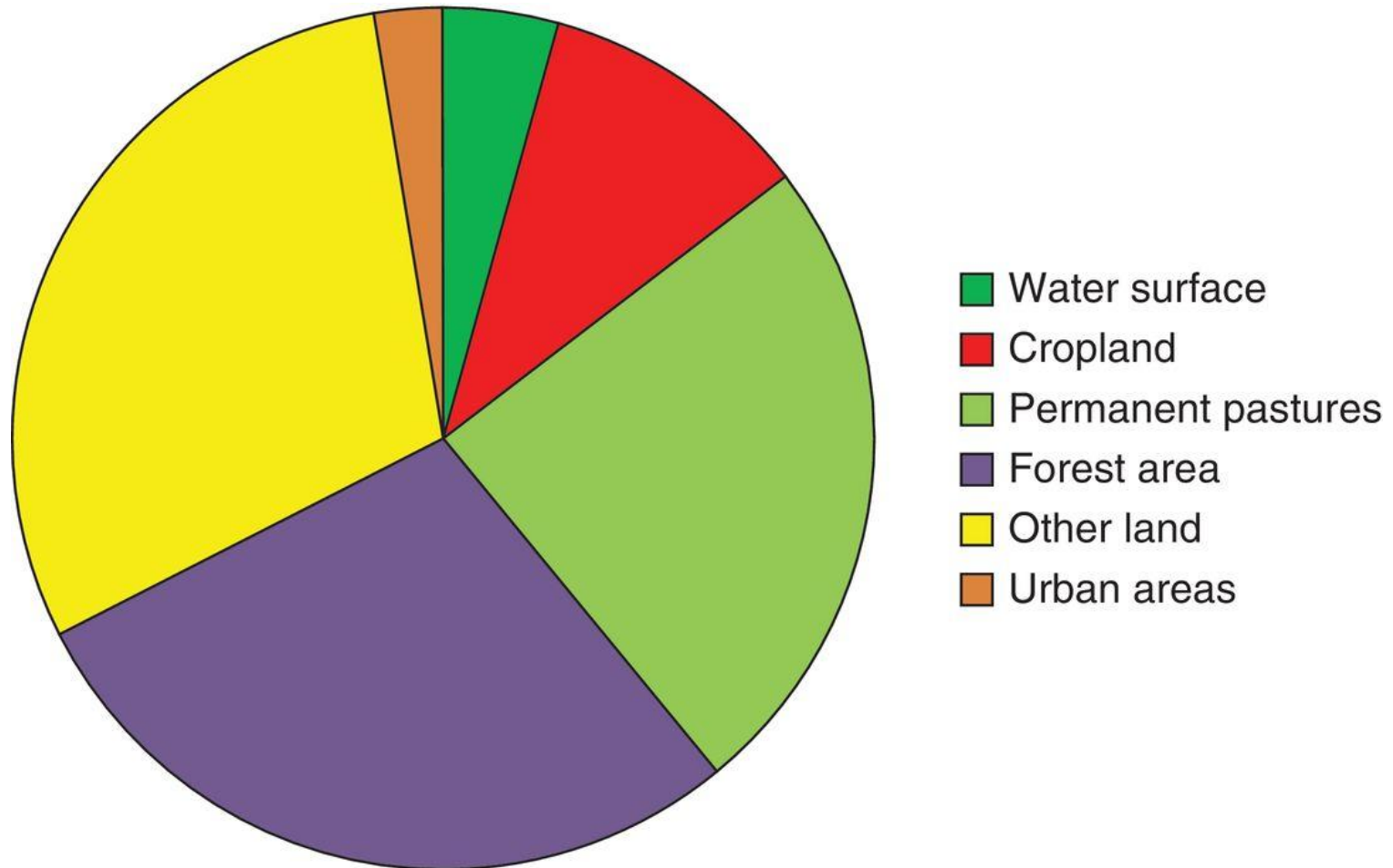
# Pinnacles National Park

- 2013 added to National Parks
  - ▣ Total of 59 in U.S.
- Native California condors observed
- Parks preserve land as much as possible
  - ▣ For enjoyment and use by future generations
  - ▣ Can take decades to establish



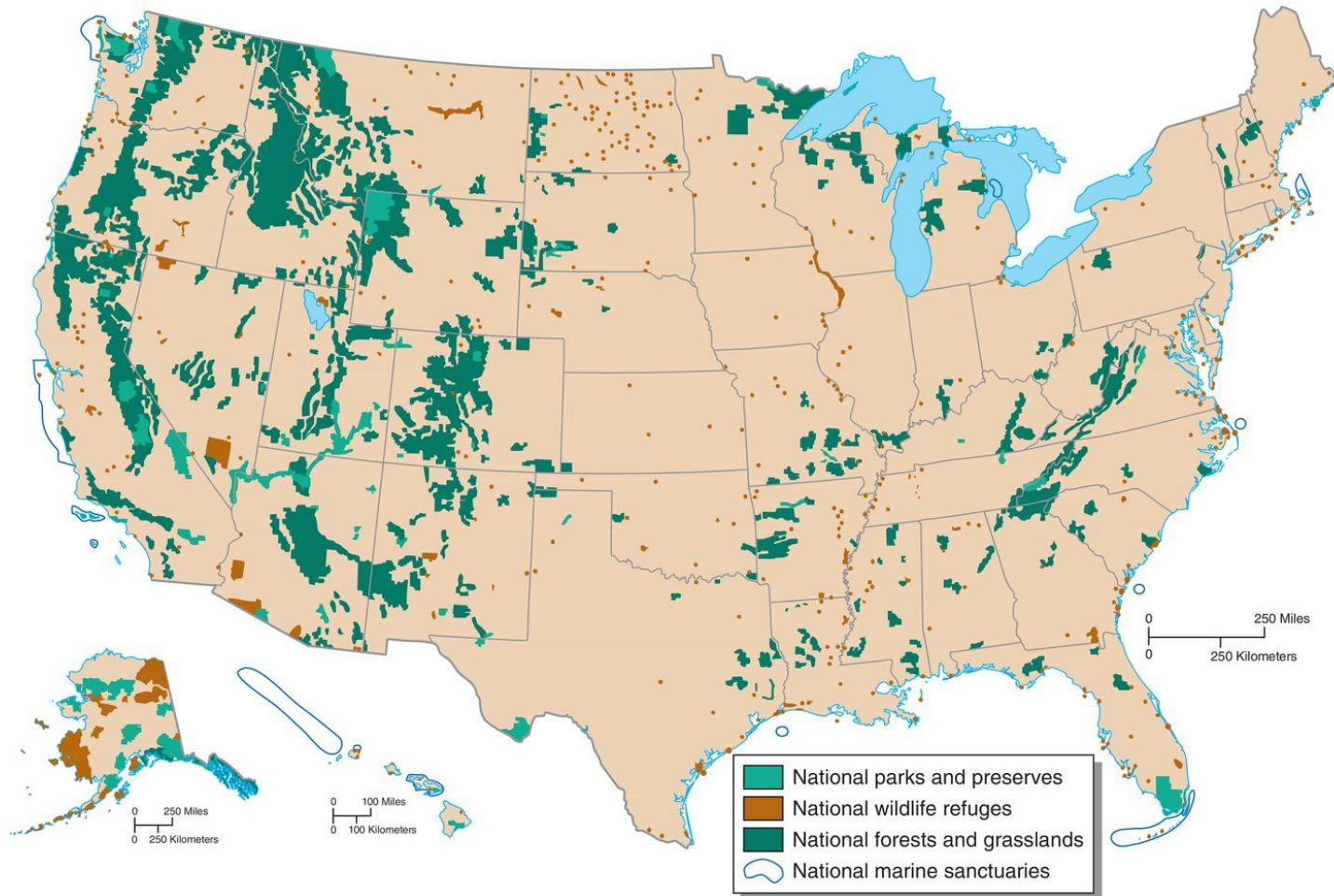
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# Land Use- Worldwide





# Land Use - United States



# Land Use - United States

- 55% of US land is privately owned
- Remainder of land is owned by government

**Table 17.1** Administration of Federal Lands

<i>Agency</i>	<i>Land Held</i>	<i>Primary Uses</i>	<i>Area in Millions of Hectares (Acres)</i>
Bureau of Land Management (Dept. of Interior)	National resource lands	Mining, livestock grazing, oil and natural gas extraction	102 (253)
U.S. Forest Service (Dept. of Agriculture)	National forests	Logging, recreation, conservation of watersheds, wildlife habitat, mining, livestock grazing, oil and natural gas extraction	78 (193)
U.S. Fish and Wildlife Service (Dept. of Interior)	National wildlife refuges	Wildlife habitat; also logging, hunting, fishing, mining, livestock grazing, oil and natural gas extraction	38 (93)
National Park Service (Dept. of Interior)	National Park System	Recreation, wildlife habitat	34 (84)
Other—including Department of Defense, Corps of Engineers (Dept. of the Army), and Bureau of Reclamation (Dept. of Interior)	Remaining federal lands	Military uses, wildlife habitat	23 (57)

Source: U.S. Department of Interior, U.S. Department of Agriculture, and U.S. Department of Defense

# Managing Public and Private Land

- Public Planning and Land Use
  - ▣ Land use decisions are complex with multiple effects
  - ▣ Must take into account
    - All repercussions of proposed land use
    - Ecosystem services of undeveloped land

# Wilderness Parks and Wildlife Refuges

- Wilderness
  - ▣ A protected area of land in which no human development is permitted
- Wilderness Act (1964)
  - ▣ Set aside federally owned land
- Managed by NPS, USFS, FWS, & BLM



Theodore Clutter / Science Source



# National Park System

- Created in 1916
- Currently includes 58 parks
- Primary goal
  - ▣ Teach people about the natural environment, management of natural resources and history of a site

## Yosemite National Park



# National Park System

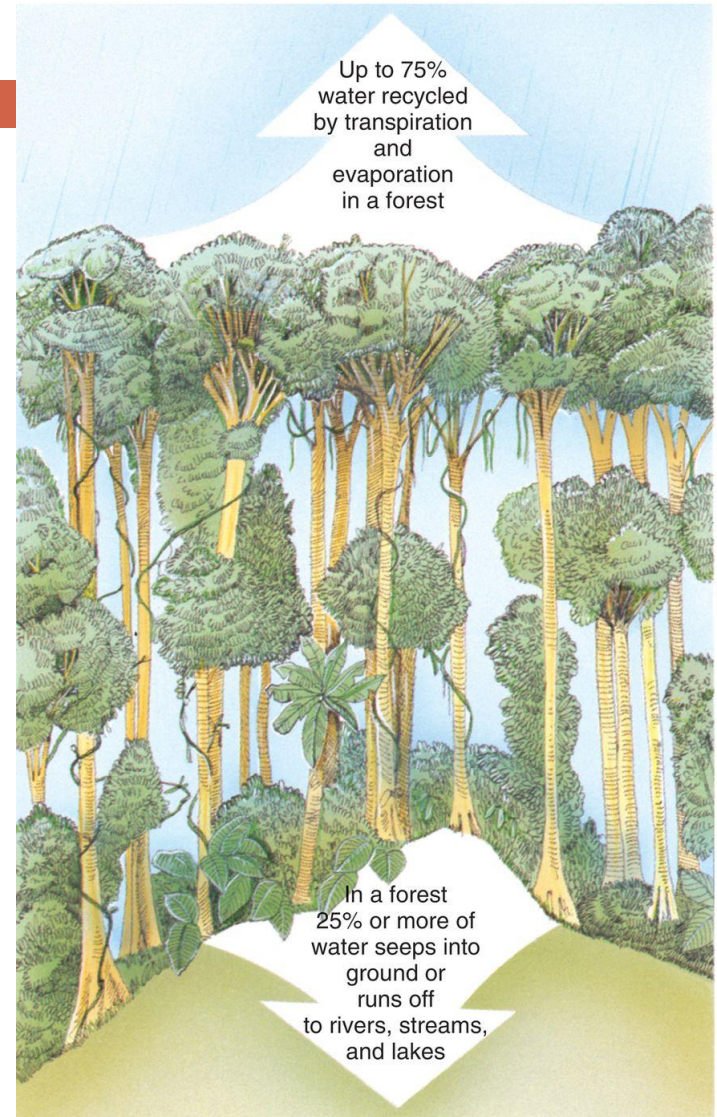
- Threats to U.S. Parks
  - ▣ Crime & Vandalism
  - ▣ Traffic jams
  - ▣ Pollution of the soil, water and air
  - ▣ Resource violations
- Natural Regulation
  - ▣ Policy to let nature take its course
  - ▣ No culling wildlife or suppressing wildfire

# Wildlife Refuges

- National Wildlife Refuge System
  - Established 1903 by Theodore Roosevelt
  - Most extensive network of lands and waters committed to wildlife habitat in the world
  - 560 refuges nationwide
- Represent all major ecosystems found in U.S.
- Mission
  - To preserve lands and waters for the conservation of fishes, wildlife, and plants of the US

# Forests

- Role in Hydrologic Cycle (right)
- Forest Management
- Deforestation
- Forest Trends in the U.S.
- Trends in Tropical Forests
- Boreal Forests





# Forest Management

- Traditional Forest Management
  - ▣ Low diversity-monocultures
    - One type of plant is cultivated over a large area
  - ▣ Managed for timber production



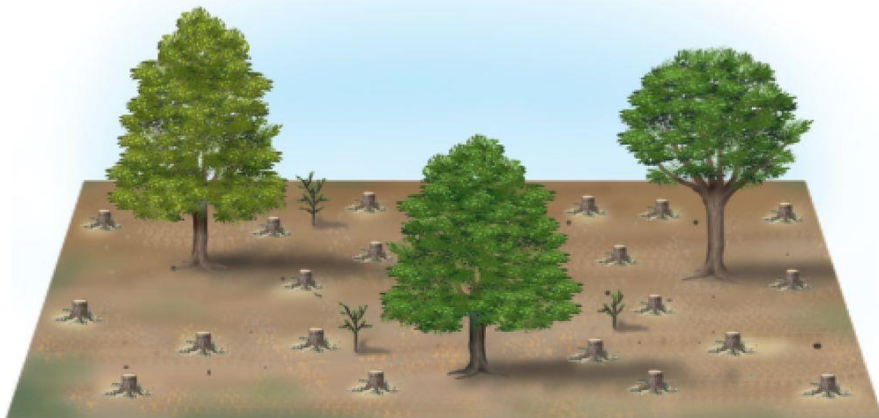
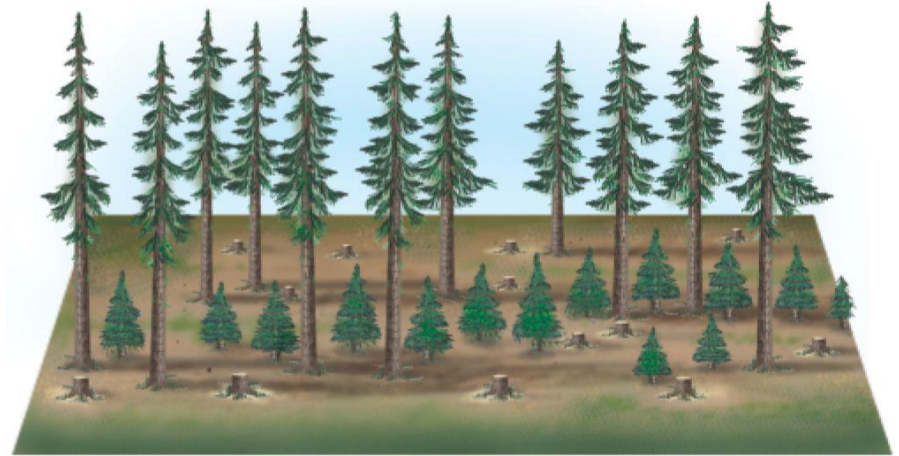
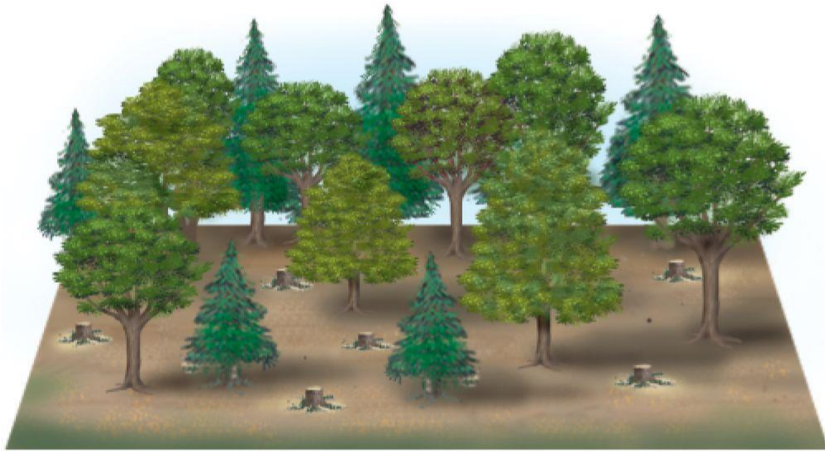
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# Forest Management

- Ecological Sustainable Forest Management
  - ▣ Environmentally balanced
  - ▣ Diverse trees
  - ▣ Prevent soil erosion
  - ▣ Preserve watersheds
  - ▣ Wildlife corridors- unlogged
  - ▣ Unlogged areas set aside as habitat corridors
  - ▣ Short and long-term health is managed

# Harvesting Trees



Calvin Larsen/Science Source

# Deforestation

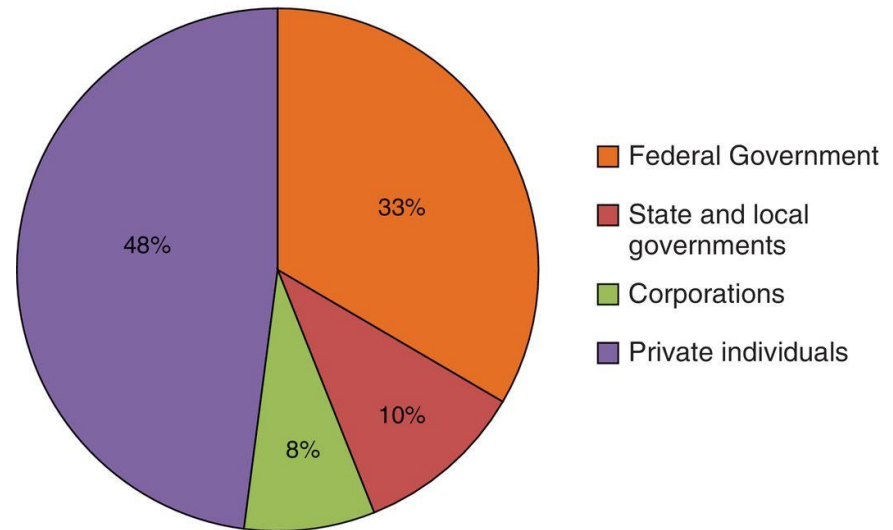
- Temporary or permanent clearance of large expanses of forest for agriculture or other use
- World forests shrank 32 million acres annually from 2000–2010
- Causes
  - ▣ Fire
  - ▣ Expansion of agriculture
  - ▣ Construction of roads
  - ▣ Tree harvest
  - ▣ Insect and disease

# Deforestation

- Results of Deforestation
  - ▣ Decreased soil fertility
  - ▣ Uncontrolled soil erosion
  - ▣ Production of hydroelectric power (silt build up behind dams)
  - ▣ Increased sedimentation of waterways
  - ▣ Formation of deserts
  - ▣ Extinction of species
  - ▣ Global climate changes

# Forest Trends in U.S.

- Most temperate forest are steady or expanding
- Returning stands lack biodiversity of original forests
- More than half of U.S. forest are privately owned (right)
  - ▣ Forest Legacy Program
  - ▣ Conservation easement





# U.S. National Forests

- Managed for multiple uses
  - ▣ Timber harvest
  - ▣ Livestock forage
  - ▣ Water resource and watershed protection
  - ▣ Mining, hunting, fishing, etc.
- Road building is an issue
  - ▣ Provides logging companies with access to forest
- Clear cutting is an issue

# Case-In-Point Tongass National Park

- One of world's few temperate rainforests
- Prime logging area
- Modified 1997 Forest Plan

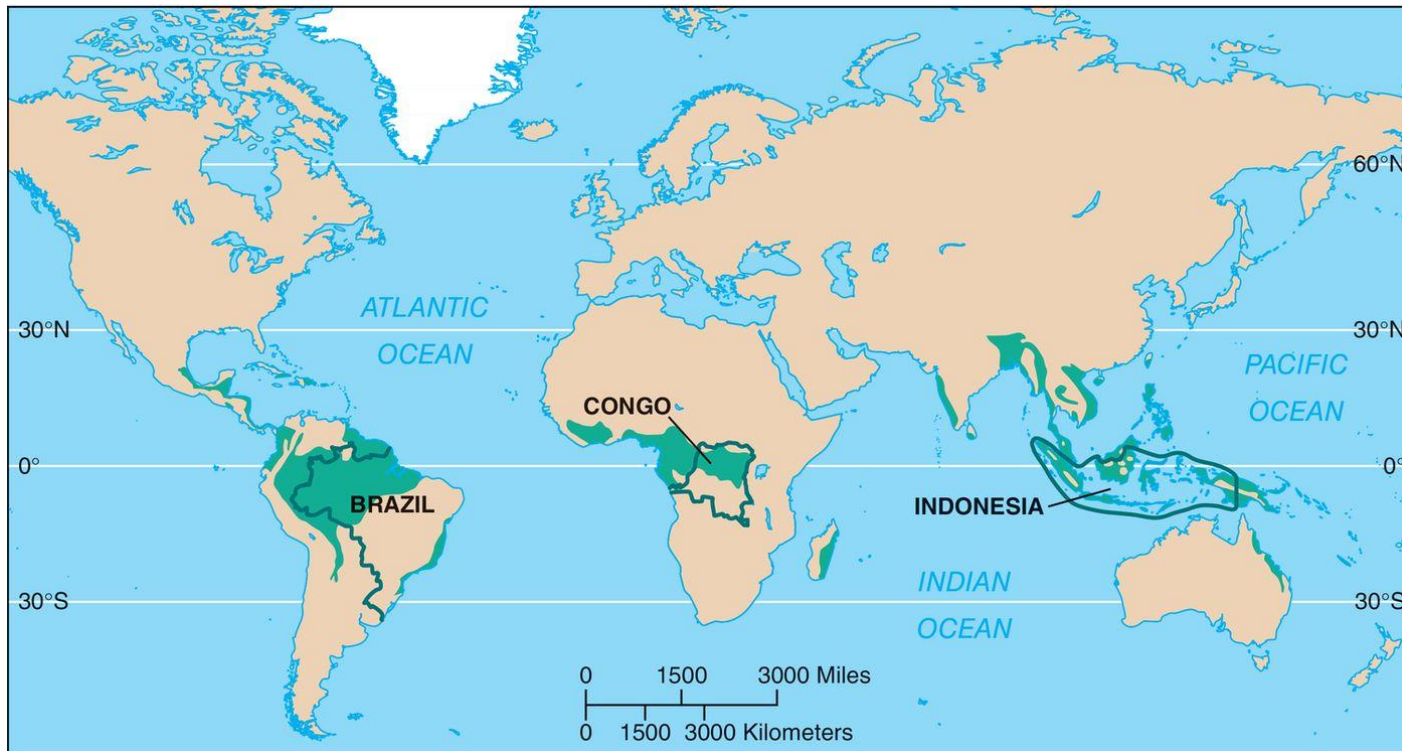


Richard Cummins/Getty Images

- Roadless Area Conservation Rule (2000)
- Politics rules government agencies

# Trends in Tropical Forests

- Tropical rainforests (below) and tropical dry forests



# Disappearing Tropical Rain Forests

- Immediate causes
  - ▣ Subsistence agriculture
  - ▣ Commercial logging
  - ▣ Cattle ranching
- Other causes
  - ▣ Mining
  - ▣ Hydroelectric power



National Remote Sensing Centre Ltd./Science Source

**Human Settlement in a  
Brazilian Tropical Rain Forest**

# Disappearing Tropical Dry Forests

- Primarily destroyed for fuel wood
  - ▣ Used for heating and cooking
- Led to fuel crisis in many countries
  - ▣ Increase in waterborne diseases (cooking water is not boiled)



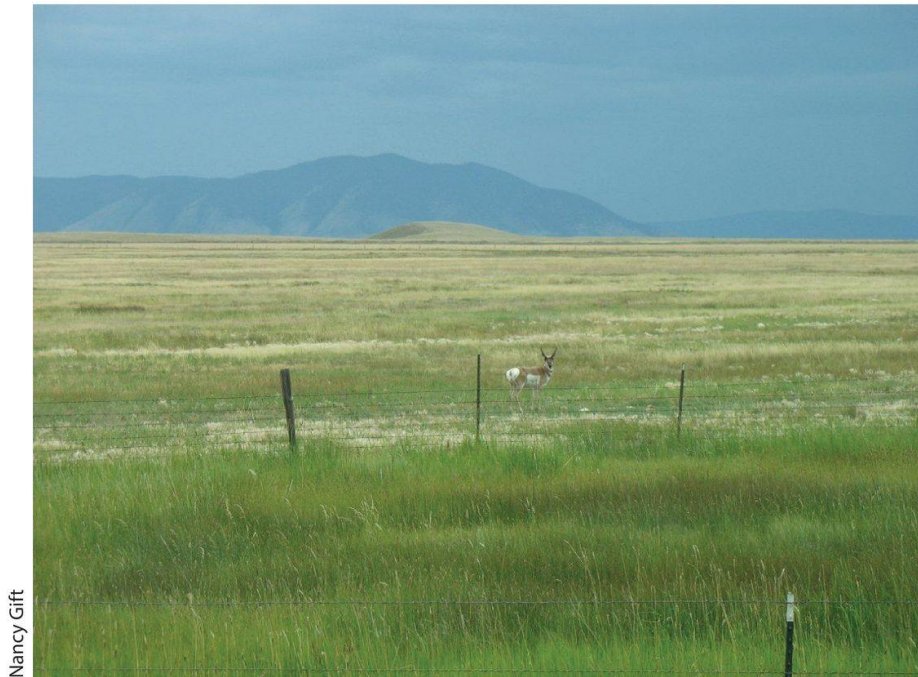
# Boreal Forests

- World's largest biome
- Extensive clear cutting
  - Primary source of world's industrial wood and wood fiber



# Rangeland and Agricultural lands

- Rangeland
  - ▣ Land that is not intensively managed and is used for grazing livestock



Nancy Gift

# Rangeland Degradation and Deforestation

- Overgrazing leaves ground barren
  - ▣ Animals exceed land's carrying capacity
- Land degradation
  - ▣ Natural or human-induced process that decreases future ability of land to support crops or livestock
- Desertification
  - ▣ Degradation of once fertile land into nonproductive desert

# Rangeland Trends in U.S.

- Make up 30% of total U.S. land area
- Pressure from developers to subdivide
- Public rangeland managed by:
  - ▣ Taylor Grazing Act (1934)
  - ▣ Federal Land Policy and Management Act (1976)
- Conditions of public rangeland are slowly improving



# Agricultural Land

- U.S. has 300 million acres of prime farmland
- Suburban sprawl
  - ▣ Parking lots
  - ▣ Housing developments
  - ▣ Shopping malls



AP Photo/York Daily Record, Bill Bowden



# Wetlands

- Lands that are usually covered with water for at least part of the year
- Have characteristic soils, and water-tolerant vegetation
- Benefits
  - ▣ Habitat for migratory waterfowl and wildlife
  - ▣ Recharge groundwater
  - ▣ Reduce damage from flooding
  - ▣ Improve water quality
  - ▣ Produce many commercially important products

# Human Threats to Wetlands

- Drainage for agriculture or mosquito control
- Dredging for navigation
- Construction of dams, dykes or seawalls
- Filling in for solid waste disposal
- Road building
- Mining for gravel, fossil fuels, etc.
- Shrinking 24,300 acres per year since 1985

# Protection of Wetlands

- Clean Water Act (1972)
  - ▣ No clear definition of wetland
- Emergency Wetlands Resource Act (1986)
- Corp of Engineers Manuals
- Opponents of wetland protection find it infringes on use of privately-owned land



Richard R. Hansen/Science Source

# Coastlines

- Coastal wetlands
  - Provide food and habitat for many aquatic animals
  - Historically regarded as wasteland
- U.S. starting to see importance of protecting this environment
  - Retaining seawalls (right)



Jacques LOIC/Getty Images

# Coastal Demographics

- Many coastal areas overdeveloped
  - ▣ 3.8 billion people live within 150km of coastline
  - ▣ 6.0 billion people will likely live there by 2025
- United States
  - ▣ 14 of 20 largest U.S. cities along coast
  - ▣ 19 of 20 most densely populated countries along coasts



# Conservation and Land Resources

- Four criteria of importance of conservation:
  - ▣ Areas lost or degraded since European colonization
  - ▣ Number of present examples of a particular ecosystem (or the total area)
  - ▣ Estimate of the likelihood that a given ecosystem will lose significant area or be degraded in next 10 years
  - ▣ Number of threatened and endangered species living in the ecosystem

# Conservation and Land Resources

**Table 17.2** The 10 Most Endangered Ecosystems in the United States

*Ecosystems (in order of priority)*

South Florida landscape

Southern Appalachian spruce-fir forests

Longleaf pine forests and savannas

Eastern grasslands, savannas, and barrens

Northwestern grasslands and savannas

California native grasslands

Coastal communities in lower 48 states and Hawaii

Southwestern riparian communities

Southern California coastal sage scrub

Hawaiian dry forest

*Source:* R. F. Noss, M. A. O'Connell, and D. D. Murphy. *The Science of Conservation Planning: Habitat Conservation Under the Endangered Species Act*. Island Press: World Wildlife Fund (1997). Reprinted with permission.

# Conservation and Land Resources

