

# Land Use

Grasslands and Rangelands  
National Parks and Reserves

# MANAGING AND SUSTAINING GRASSLANDS

- Almost half of the world's livestock graze on natural grasslands (rangelands) and managed grasslands (pastures).
- We can sustain rangeland productivity by controlling the number and distribution of livestock and by restoring degraded rangeland.

# MANAGING AND SUSTAINING GRASSLANDS



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- Overgrazing (left) occurs when too many animals graze for too long and exceed carrying capacity of a grassland area.

Figure 10-21

# MANAGING AND SUSTAINING GRASSLANDS



- Example of restored area along the San Pedro River in Arizona after 10 years of banning grazing and off-road vehicles.

Figure 10-22

# Case Study: Grazing and Urban Development in the American West

- Ranchers, ecologists, and environmentalists are joining together to preserve the grasslands on cattle ranches.
  - Paying ranchers conservation easements (barring future owners from development).
  - Pressuring government to zone the land to prevent development of ecologically sensitive areas.

# Management of the American West

- Overexploitation of resources caused great damage to the American West
  - Poor farming practices, overgrazing, farming arid lands
- John Wesley Powell in the late 1800s called for agencies to base management on science
  - Farming Western lands had to account for arid conditions
  - His ideas were ignored, contributing to failures such as the Dust Bowl of the 1930s



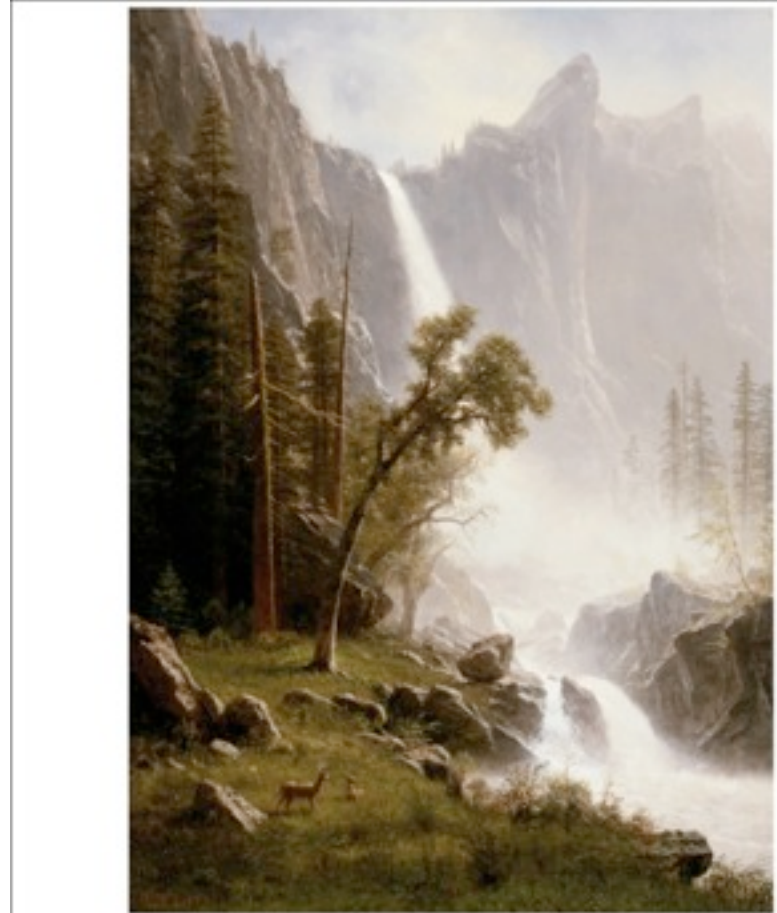
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# Parks and reserves

- Reasons for establishing parks and reserves include:
  - **Monumentalism** = preserving areas with enormous, beautiful or unusual features, such as the Grand Canyon
  - Offer recreational value to tourists, hikers, fishers, hunters and others
  - Protect areas with utilitarian benefits, such as clean drinking water
  - Use sites that are otherwise economically not valuable and are therefore easy to protect
  - Preservation of biodiversity

# Federal parks and reserves began in the U.S.

- **National parks** = public lands protected from resource extraction and development
  - Open to nature appreciation and recreation
  - Yellowstone National Park was established in 1872
- **The Antiquities Act of 1906**
  - The president can declare selected public lands as national monuments



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# The National Park Service (NPS)

- Created in 1916 to administer parks and monuments
  - 388 sites totaling 32 million ha (72 million acres)
  - Includes national historic sites, national recreation areas, national wild and scenic rivers
  - 273 million visitors in 2006

# National Wildlife Refuges

- Begun in 1903 by President Theodore Roosevelt
- 37 million ha (91 million acres) in 541 sites
- U.S. Fish and Wildlife Service administers refuges
  - Management ranges from preservation to manipulation
  - Wildlife havens
  - Allows hunting, fishing, wildlife observation, photography, education

# Wilderness areas



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- **Wilderness areas** = area is off-limits to development of any kind
  - Open to the public for hiking, nature study, etc.
  - Must have minimal impact on the land
  - Necessary to ensure that humans don't occupy and modify all natural areas
- Established within federal lands
  - Overseen by the agencies that administer those areas

# Not everyone supports land set-asides

- Restriction of activities in wilderness areas generated opposition to U.S. land protection policies
  - Some western states want resource extraction and development
- **The wise-use movement** = a coalition of individuals and industries that oppose environmental protection
  - Protecting private property, transferring federal lands to state or private hands, promoting motorized recreation on public lands
  - Farmers, ranchers, loggers, mineral and fossil fuel industries

# Wilderness protection has been weakened

- President George W. Bush has weakened wilderness protection
  - Federal agencies have shifted policies and enforcement
  - Away from preservation and conservation
  - Toward recreation and resource extraction

# Nonfederal entities also protect land

- Each U.S. state and Canadian province has agencies that manage resources
  - So do counties and municipalities
- **Land trusts** = local or regional organizations that purchase land to protect it
  - The Nature Conservancy is the world's largest land trust
  - Trusts protect 4.1 million ha (10.2 million acres)
  - Jackson Hole, Wyoming is protected by a land trust

# Parks and reserves are increasing internationally

- Many nations have established national parks
  - Benefit from ecotourism
  - Protected areas now cover 9.6% of the world's land area
- Parks do not always receive necessary funding
  - **Paper parks** = Areas protected on paper but not in reality
  - **World heritage sites** = protected areas that fall under national sovereignty but are designated or managed by the United Nations
    - 830 sites across 184 countries

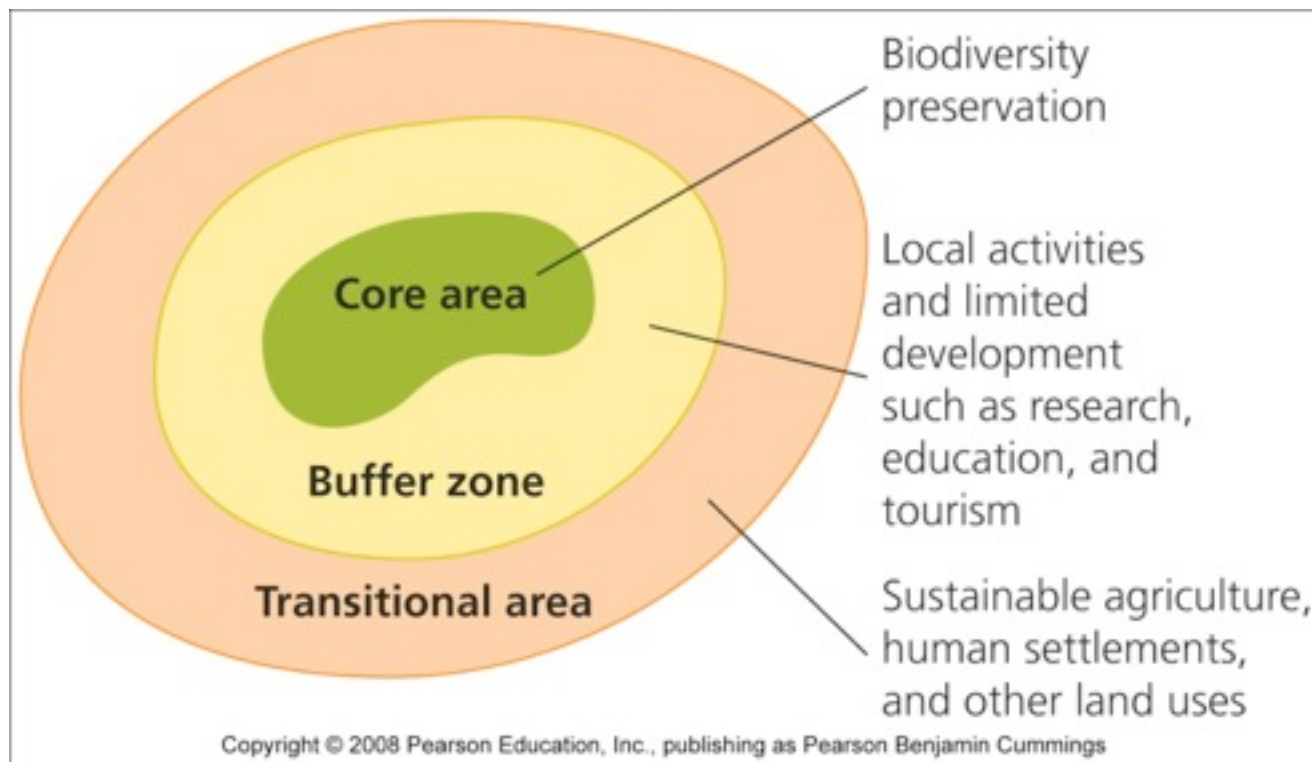
# Transboundary and peace parks

- **Transboundary park** = an area of protected land overlapping national borders
  - For example, Waterton–Glacier National Parks in the U.S. and Canada
- **Peace parks** = transboundary reserves that help ease tensions by acting as buffers between nations
- **Biosphere reserves** = land with exceptional biodiversity
  - Couple preservation with sustainable development



# Biosphere reserves have several zones

- This can be a win-win situation for everyone



# Habitat fragmentation threatens species

- Contiguous habitat is chopped into small pieces
  - Species suffer



(a) Mount Hood National Forest, Oregon

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(b) Wood thrush

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1831



1882



1902



1950

(c) Fragmentation of wooded area (green) in Cadiz Township, Wisconsin

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# The SLOSS dilemma

- Which is better to protect species?
  - A **S**ingle **L**arge **O**r **S**everal **S**mall reserves?
  - Depends on the species: tigers vs. insects
- Corridors = protected land that allows animals to travel between islands of protected habitat
  - Animals get more resources
  - Enables gene flow between populations

# NATIONAL PARKS

- Countries have established more than 1,100 national parks, but most are threatened by human activities.
  - Local people invade park for wood, cropland, and other natural resources.
  - Loggers, miners, and wildlife poachers also deplete natural resources.
  - Many are too small to sustain large–animal species.
  - Many suffer from invasive species.

# Case Study: Stresses on U.S. National Parks



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- Overused due to popularity.
- Inholdings (private ownership) within parks threaten natural resources.
- Air pollution.

Figure 10-23

## Solutions

### National Parks

- Integrate plans for managing parks and nearby federal lands
- Add new parkland near threatened parks
- Buy private land inside parks
- Locate visitor parking outside parks and use shuttle buses for entering and touring heavily used parks
- Increase funds for park maintenance and repairs
- Survey wildlife in parks
- Raise entry fees for visitors and use funds for park management and maintenance
- Limit the number of visitors to crowded park areas
- Increase the number and pay of park rangers
- Encourage volunteers to give visitor lectures and tours
- Seek private donations for park maintenance and repairs

- Suggestions for sustaining and expanding the national park system in the U.S.

# NATURE RESERVES

- Ecologists call for protecting more land to help sustain biodiversity, but powerful economic and political interests oppose doing this.
  - Currently 12% of earth's land area is protected.
  - Only 5% is strictly protected from harmful human activities.
  - Conservation biologists call for full protection of at least 20% of earth's land area representing multiple examples of all biomes.

# NATURE RESERVES

- Large and medium-sized reserves with buffer zones help protect biodiversity and can be connected by corridors.

➤ Costa Rica has consolidated its parks and reserves into 8 megareserves designed to sustain 80% of its biodiversity.

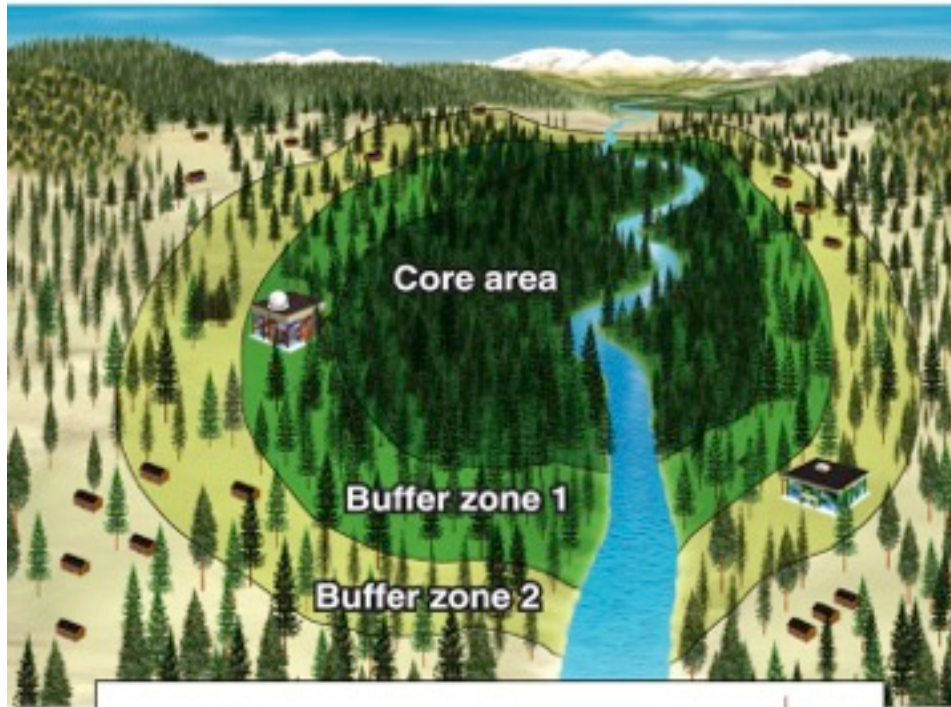


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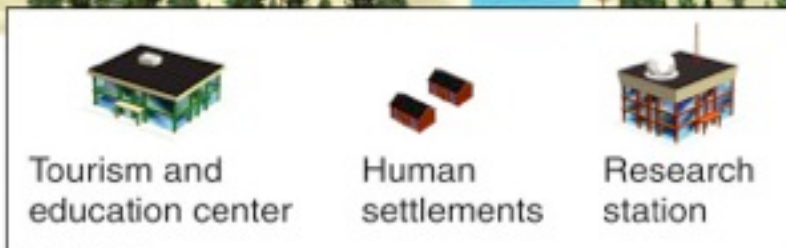


# NATURE RESERVES

## Biosphere Reserve



- A model biosphere reserve that contains a protected inner core surrounded by two buffer zones that people can use for multiple use.



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Figure 10-25

# NATURE RESERVES

- We can prevent or slow down losses of biodiversity by concentrating efforts on protecting global hot spots where significant biodiversity is under immediate threat.
- Conservation biologists are helping people in communities find ways to sustain local biodiversity while providing local economic income.

# NATURE RESERVES

- Geographic Information System (GIS) mapping can be used to understand and manage ecosystems.
  - Identify areas to establish and connect nature reserves in large eco-regions to prevent fragmentation.
  - Developers can use GIS to design housing developments with the least environmental impact.

# NATURE RESERVES

- Wilderness is land legally set aside in a large enough area to prevent or minimize harm from human activities.
- Only a small percentage of the land area of the United States has been protected as wilderness.