

Human land use affects the environment in many ways

- Every human use of land alters it in some way.
- People do not always agree on land use and management priorities.

To understand land use and management issues, environmental scientists use 3 concepts:

- Tragedy of the commons
- Externalities
- Maximum sustainable yield

Tragedy of the Commons

- **Tragedy of the commons** The tendency of a shared, limited resource to become depleted because people act from self-interest for short-term gain.
- When many people share a common resource without agreement on or regulation of its use, it is likely to become overused very quickly.

Tragedy of the Commons

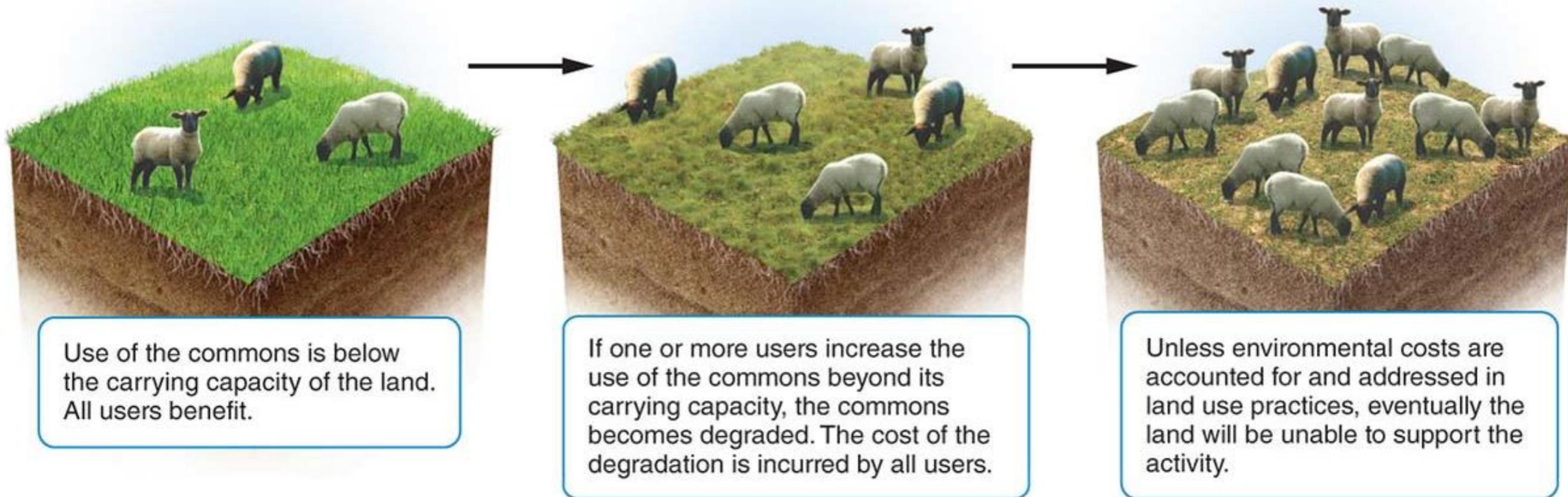


Figure 29.2
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The tragedy of the commons. If the use of common land is not regulated in some way—by the users or by a government agency—the land can easily be degraded to the point at which it can no longer support that use.

Externalities

- **Externality** The cost or benefit of a good or service that is not included in the purchase price of that good or service.
- Environmental scientists are concerned about negative externalities because of the environmental damage for which no one bears the cost.

Public lands are classified according to their use

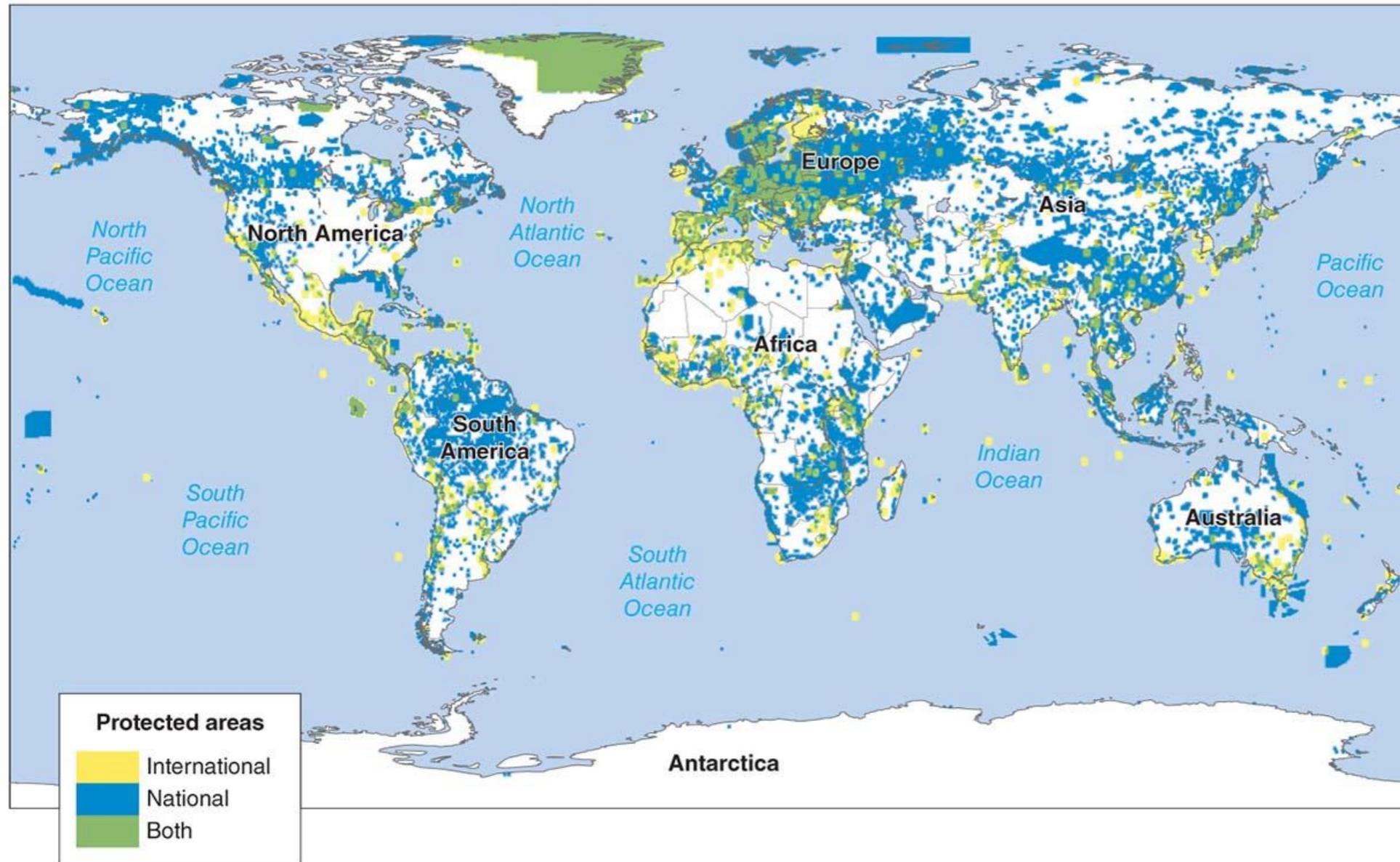


Figure 29.4
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Data from http://protectedplanet.net/#2_43.5_-72.25_0

Protected land and marine areas of the world. Protected areas are distributed around the globe.

International Categories of Public Lands

The United Nations recognizes six categories of public lands:

- **National parks** are managed for scientific, educational, and recreational use, and sometimes for their beauty or unique landforms.
- **Managed Resource Protected Areas** are designated for the sustained use of biological, mineral, and recreational resources.
- **Habitat/Species Management Areas** are actively managed to maintain biological communities.

International Categories of Public Lands (Cont.)

- **Strict Nature Reserves and Wilderness Areas** are set aside to protect species and ecosystems.
- **Protected Landscapes and Seascapes** permit nondestructive use of natural resources while allowing for tourism and recreation.
- **National Monuments** are designated to protect unique sites of special natural or cultural interests.

Public Lands in the United States

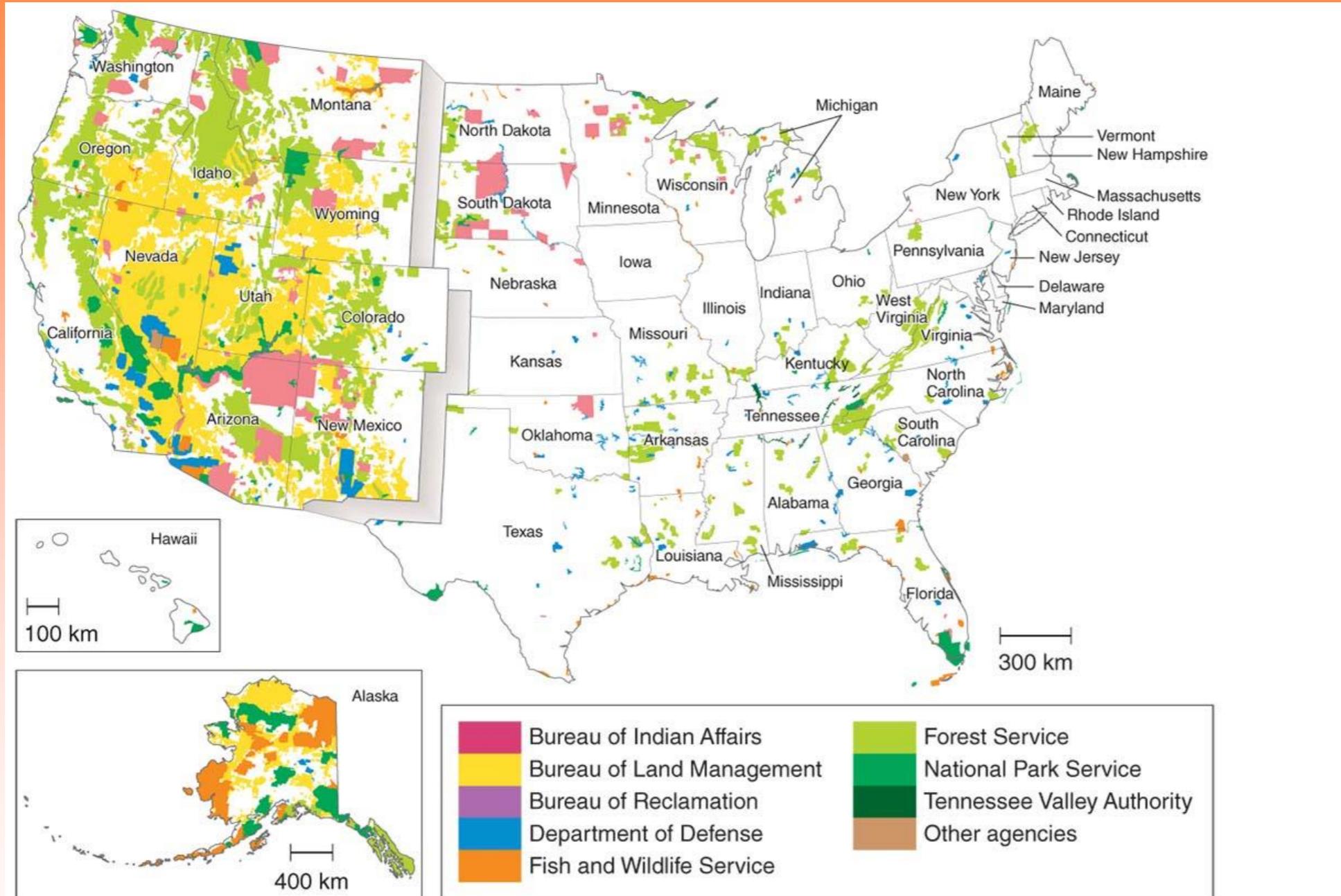
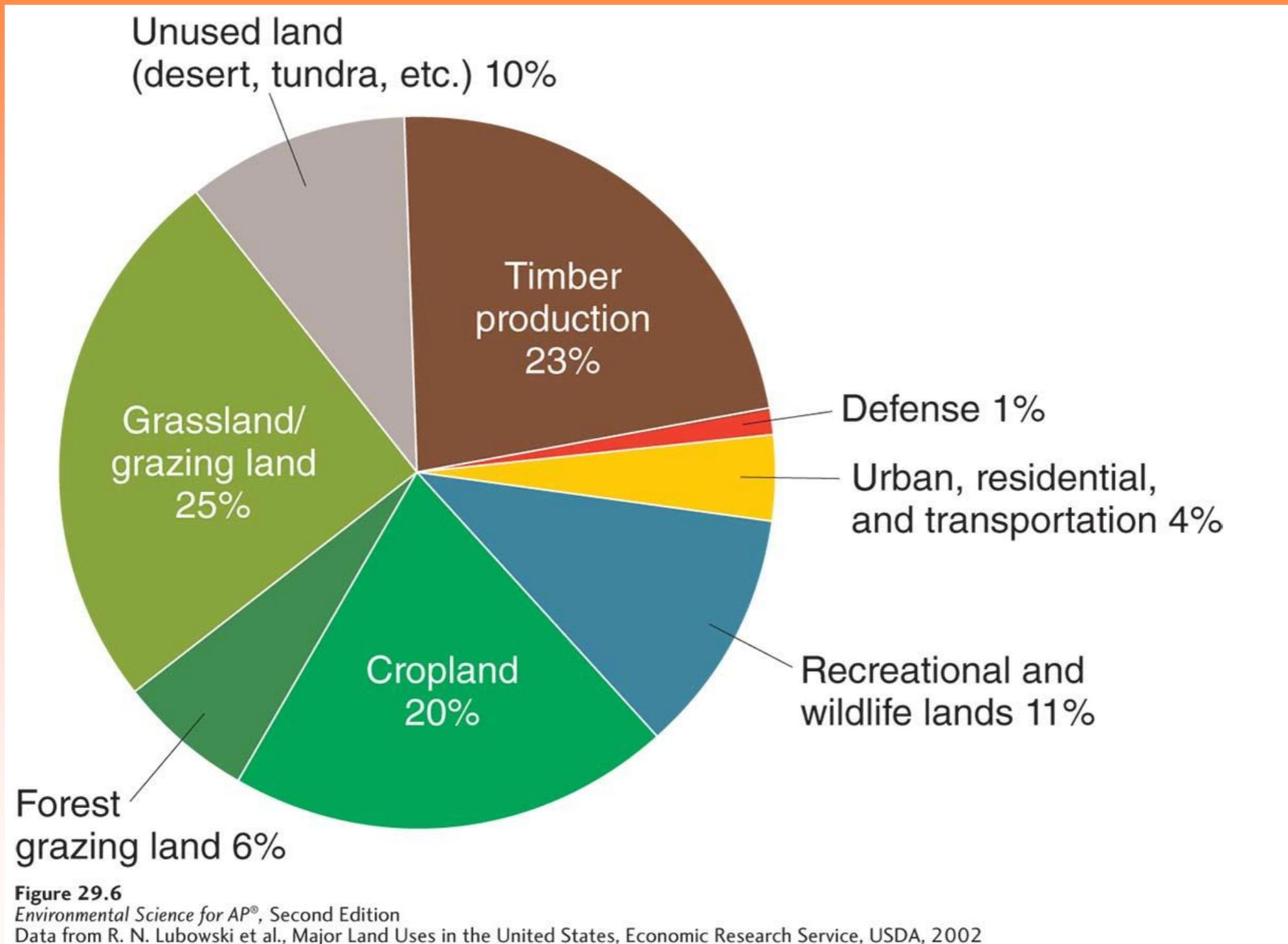


Figure 29.5
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 After <http://nationalatlas.gov>

Federal lands in the United States. Approximately 42 percent of the land in the United States is publicly owned, with 25 percent of the nation's land owned by the federal government.

Public Lands in the United States



Land use in the United States. Public and private land in the United States is used for many purposes.

Public Lands in the United States

More than 95 percent of all federal lands are managed by four federal agencies.

- Bureau of Land Management (BLM): grazing, mining, timber harvesting and recreation
- U.S. Forest Service (USFS): timber harvesting, grazing, and recreation
- National Park Service (NPS): recreation and conservation.
- Fish and Wildlife Service (FWS): conservation, hunting, and recreation

Land management practices vary according to land use

Management issues differ for rangelands, forests, and parks.

Rangelands

- **Rangeland** A dry open grassland.
- Grazing too many animals can quickly denude a region of vegetation. Loss of vegetation can lead to land exposed to wind and water erosion.

Forests

- **Forest** Land dominated by trees and other woody vegetation and sometimes used for commercial logging.
- Approximately 73 percent of the forests used for commercial timber operations in the U.S. are privately owned.
- Timber harvest practices include clear-cutting and selective cutting
- **Clear-cutting** A method of harvesting trees that removes all or almost all trees in an area.
- **Selective cutting** The method of harvesting trees that involves removing single trees or a small number of trees from many in a forest.

Timber Harvest Practices



↓
Regrowth



(a) Clear-cutting



↓
Regrowth



(b) Selective cutting

Timber harvest practices.

(a) Clear-cutting removes most, if not all, trees from an area and is often coupled with replanting. The resulting trees are then all the same age. (b) In selective cutting, single trees or small numbers of trees are harvested. The resulting forest consists of trees of varying ages.

Figure 30.2

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Fire Management

- In many ecosystems fire is a natural process for recycling nutrients.
- Humans have followed a number of fire management policies.
- **Prescribed burn** A fire deliberately set under controlled conditions in order to reduce the accumulation of dead biomass on a forest floor.
- Prescribed burns help reduce the risk of uncontrolled natural fires.

National Parks

- National Parks are managed for scientific, educational, aesthetic, and recreational use.
- Human overuse can harm the environmental features that attract visitors.

Wildlife Refuges and Wilderness Areas

- **National wildlife refuge** A federal public land managed for the primary purpose of protecting wildlife.
- **National wilderness area** An area set aside with the intent of preserving a large tract of intact ecosystem or a landscape.

Federal Regulation of Land Use

- **National Environmental Policy Act (NEPA)** A 1969 U.S. federal act that mandates an environmental assessment of all projects involving federal money or federal permits.
- **Environmental impact statement (EIS)** A document outlining the scope and purpose of a development project, describing the environmental context, suggesting alternative approaches to the project, and analyzing the environmental impact of each alternative.
- **Environmental mitigation plan** A plan that outlines how a developer will address concerns raised by a project's impact on the environment.
- **Endangered Species Act** A 1973 U.S. act designed to protect species from extinction

Residential Land Use

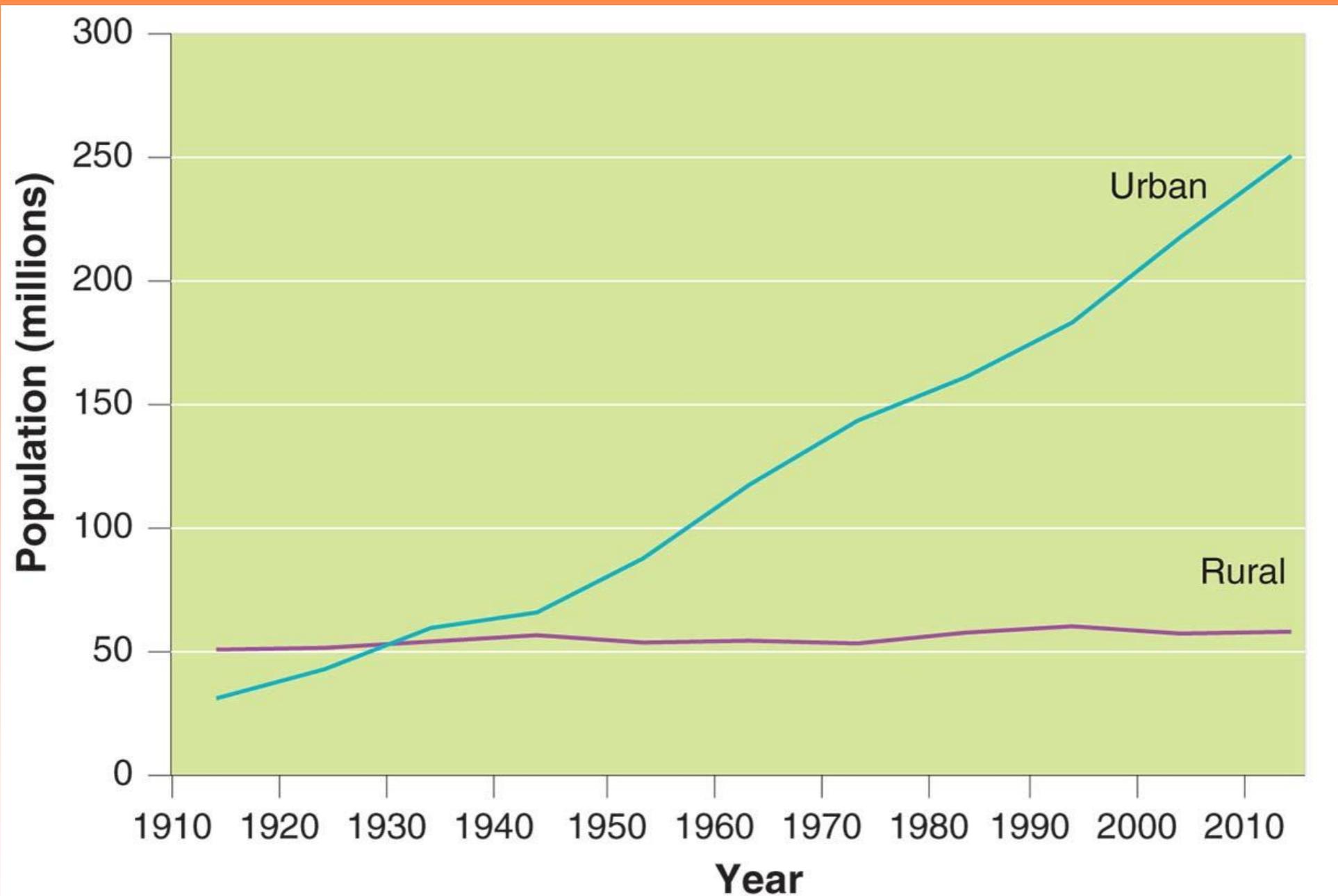


Figure 30.7
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Data from <http://www.census.gov/geo/reference/ua/urban-rural-2012.html>

Distribution of urban and rural populations in the United States between 1910 and 2012. This graph shows a dramatic shift in the population from rural to urban areas.

Causes and Consequences of Urban Sprawl

- **Urban sprawl** Urbanized areas that spread into rural areas, removing clear boundaries between the two.

Urban sprawl has four main sources:

- Automobiles and highway construction
- Living costs
- Urban blight
- Government policies
- **Urban blight** The degradation of the built and social environments of the city that often accompanies and accelerates migration to the suburbs.

Urban Sprawl

Urban sprawl has been enhanced by federal and local laws and policies:

- **Highway Trust Fund** A U.S. federal fund that pays for the construction and maintenance of roads and highways.
- **Induced demand** The phenomenon in which an increase in the supply of a good causes demand to grow.
- **Zoning** A planning tool used to separate industry and business from residential neighborhoods.
- **Multi-use zoning** A zoning classification that allows retail and high-density residential development to coexist in the same area.

Smart Growth

- **Smart growth** A set of principles for community planning that focuses on strategies to encourage the development of sustainable, healthy communities.

Smart growth follows ten principles :

- 1. Create mixed land uses.
- 2. Create a range of housing opportunities and choices.
- 3. Create walkable neighborhoods.
- 4. Encourage community and stakeholder collaboration in development decisions.
- **Stakeholder** A person or organization with an interest in a particular place or issue.

Smart Growth

- 5. Take advantage of compact building design.
- 6. Foster distinctive, attractive communities with a strong sense of place.
- **Sense of place** The feeling that an area has a distinct and meaningful character.
- 7. Preserve open space, farmland, natural beauty and critical environmental areas.

Smart Growth

- 8. Provide a variety of transportation choice.
- **Transit-oriented development (TOD)** Development that attempts to focus dense residential and retail development around stops for public transportation, a component of smart growth.
- 9. Strengthen and direct development toward existing communities
- **Infill** Development that fills in vacant lots within existing communities.
- **Urban growth boundary** A restriction on development outside a designated area.
- 10. Make development decisions predictable, fair and cost-effective