



# CH 10: LAND RESOURCES

# 10/27 Human Land Use CH 10

Obj. TSW identify and explain the Tragedy of the Commons, externalities and maximum sustainable yield pg. 18

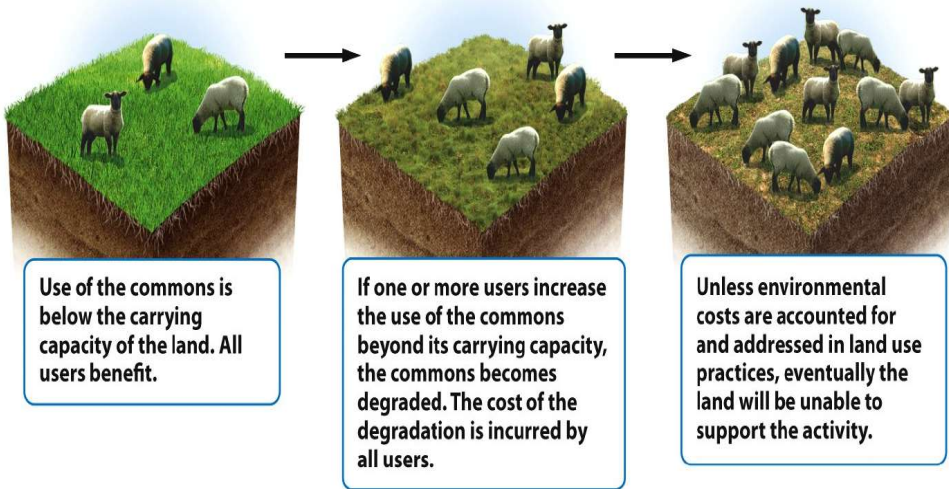


Figure 10.2  
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1. Explain the Tragedy of the Commons. What is an example for today's world?
2. Explain an externality.
3. Copy the Maximum Sustainable yield (10.3), what graph does it remind you of?

# The Tragedy of the Commons

- 1968: Garrett Hardin described the “Tragedy of the Commons”
- The tendency of a shared, limited resource to become depleted because people act from self-interest for short-term gain
- Observed that when many individuals share a common resource without agreement on or regulation of its use, likely to become overused very quickly



**Use of the commons is below the carrying capacity of the land. All users benefit.**



**If one or more users increase the use of the commons beyond its carrying capacity, the commons becomes degraded. The cost of the degradation is incurred by all users.**



**Unless environmental costs are accounted for and addressed in land use practices, eventually the land will be unable to support the activity.**

**Figure 10.2**

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# Externalities

- A cost or benefit of a good or service that is not included in the purchase price of the product or service
- We are concerned about negative externalities because of the environmental damage for which no one bears the cost
- EX) Factory Polluting surrounding areas
- Solutions:
  - Privatization
  - Regulation

# (EX) Unicorn Populations

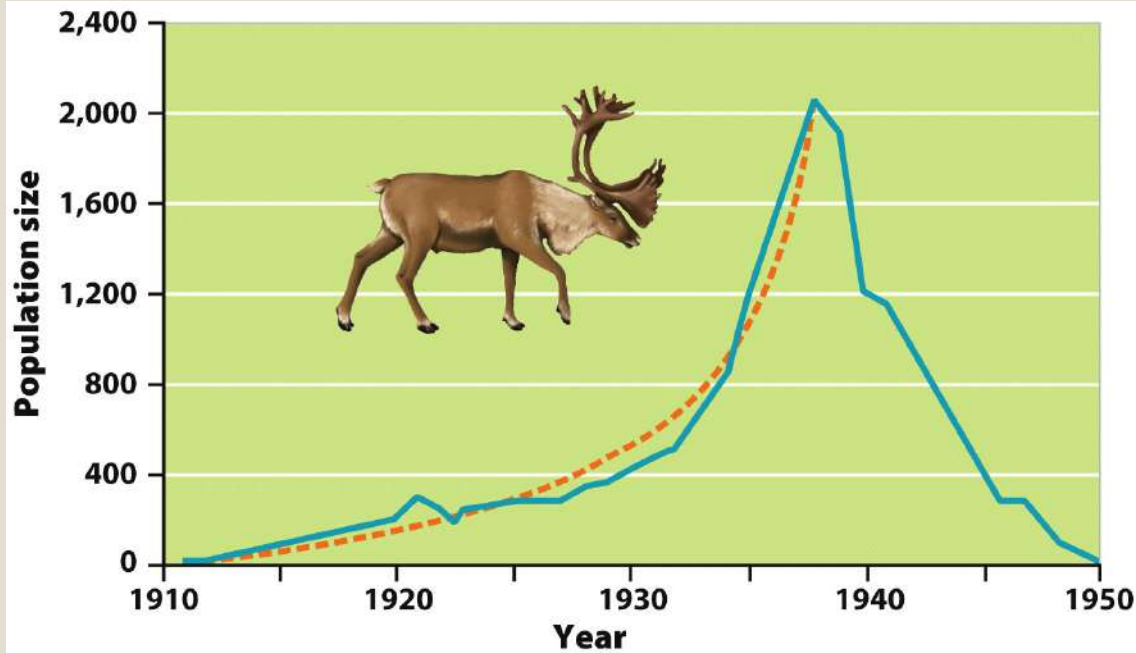


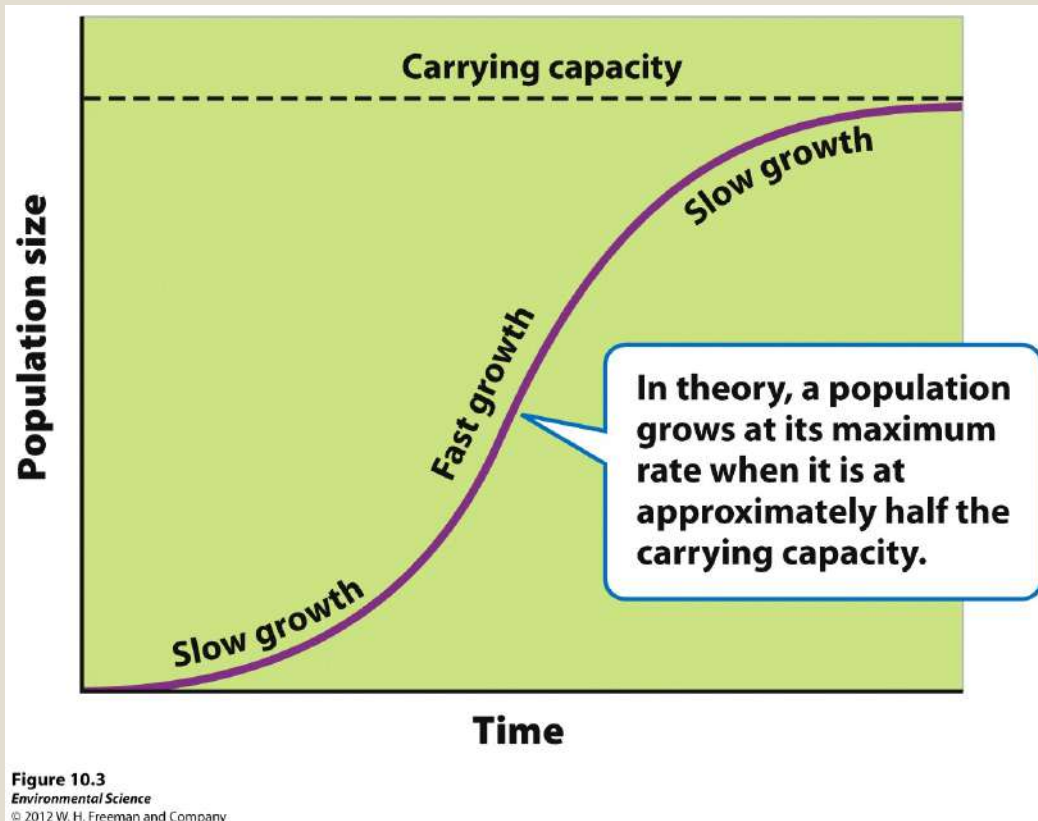
Figure 6.8  
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Intermediate Amount of Regulation=  
Leave enough to reproduce at a rate  
that main the population but not have  
competition for food

- (1) Unicorn population not checked=  
Population grows so much, not enough food to support it=  
population crashes
- (2) Hunting is unregulated=  
unicorn population depleted to point of endangerment

# Maximum Sustainable Yield

- The maximum amount of a renewable resource that can be harvested without compromising the future availability of that resource.



- Sustainable harvesting
- Hard to calculate but...

# Surface Mining Activity pg. 23

- Groups of 4, go over to the shoe boxes
- Each group (company) needs a name; Distribute the jobs accordingly
  - Field Geologist/Accountant
  - Miner
  - Process Engineer
  - Environmental Engineer
- Complete activity and then answer Questions and Analysis for homework, answer on pg. 23 or separate page if no room



# 10/28 CH 10 Land Management

Obj. TSW identify and explain how land is classified, how land is used, and what the impacts of our use are.

P. 20 NB

1. Explain how our use of land affects the environment.
2. What are the main uses of public lands in the US?
3. What is resource conservation ethic and how does it relate to multiple use lands?



Figure 10.10  
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# Tragedy of the Commons Clarification

- Oil → Because there is a limited supply, oil companies know that in order to maximize profit, they have to extract as much as they can
- Idea of Tragedy of the Commons is “common pool resources”
- Air, water, other natural resources that people DON'T own
- People at some point own the oil because they own the land
- But you can't ever really own air or the ocean

# Negative consequences of land use



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Mudslide caused by logging & poor land management.



Figure 10.1b  
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Habitat conversion & land degradation due to shifting agriculture.



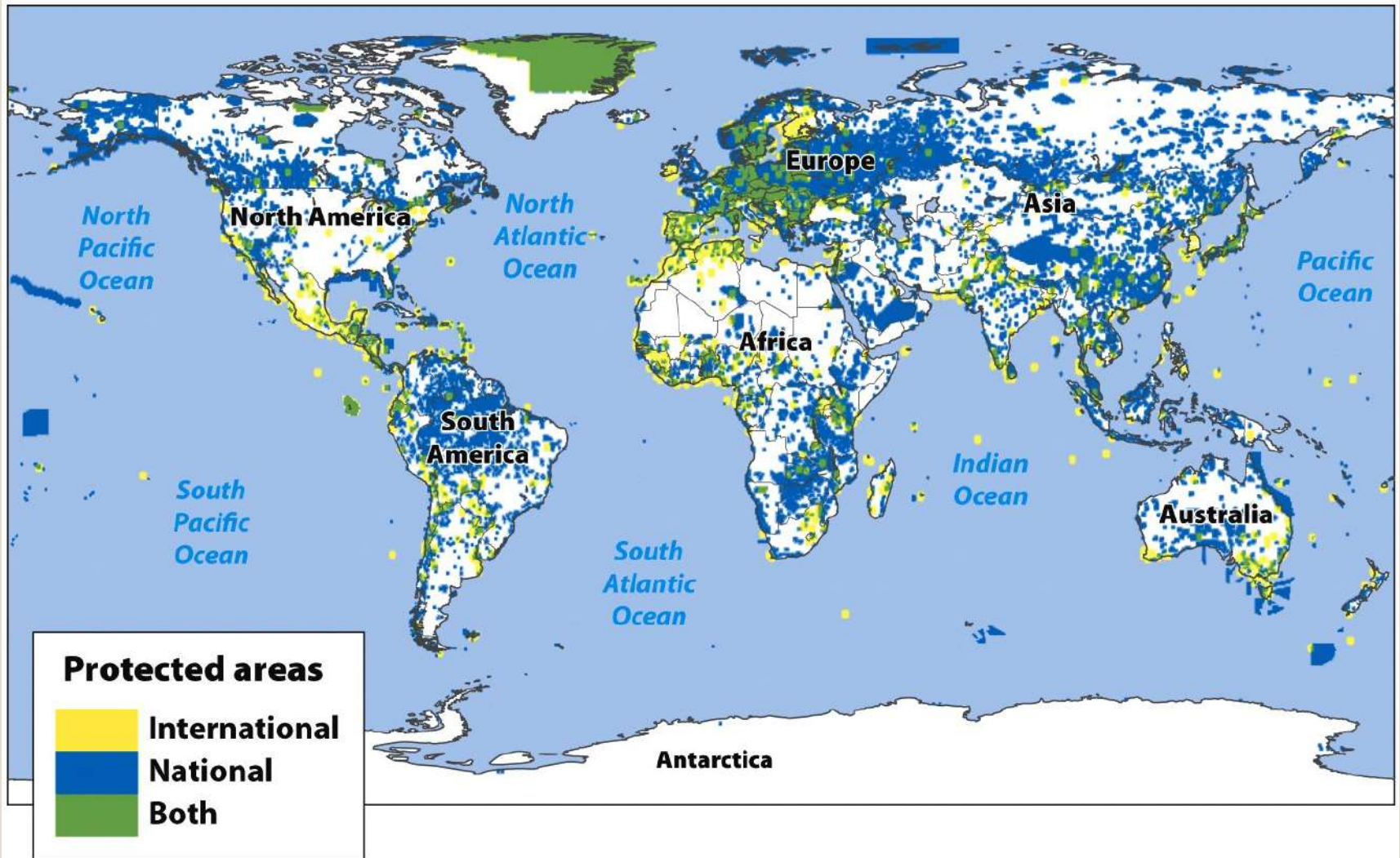
Logging and other habitat alteration can adversely affect species like the spotted owl.

Extensive paving of land decreases the amt of land for vegetation and water infiltration.



Figure 10.1d  
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# Protected land and marine areas of the world



**Figure 10.4**

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# Public Lands

- National Parks
- Managed Resource Protected Areas
- Habitat/Species Management Areas
- Strict Nature Reserves and Wilderness Areas
- Protected Landscapes and Seascapes
- National Monuments

# Public Lands

- National Parks- managed for scientific, educational, and recreational use, and sometimes for their beauty or unique landforms.
- Managed Resource Protected Areas- managed for the sustained use of biological, mineral, and recreational resources.
- Habitat/Species Management Areas- actively managed to maintain biological communities.
- Strict Nature Reserves and Wilderness Areas- established to protect species and ecosystems.
- Protected Landscapes and Seascapes- nondestructive use of natural resources while allowing for tourism and recreation.
- National Monuments- set aside to protect unique sites of special natural or cultural interests.

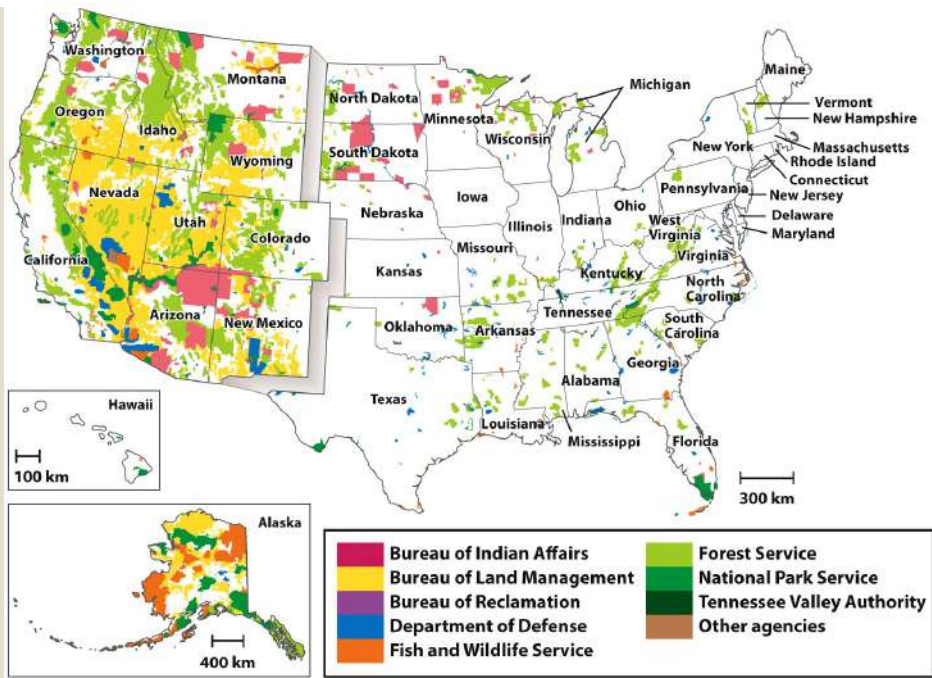


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**Federal Lands in the US**  
 42% of land in US is Publically owned  
 25% is owned by the Federal Government

## Land Use in the US

- Rangelands, National forests, National parks, National Wildlife Refuges, Wilderness areas

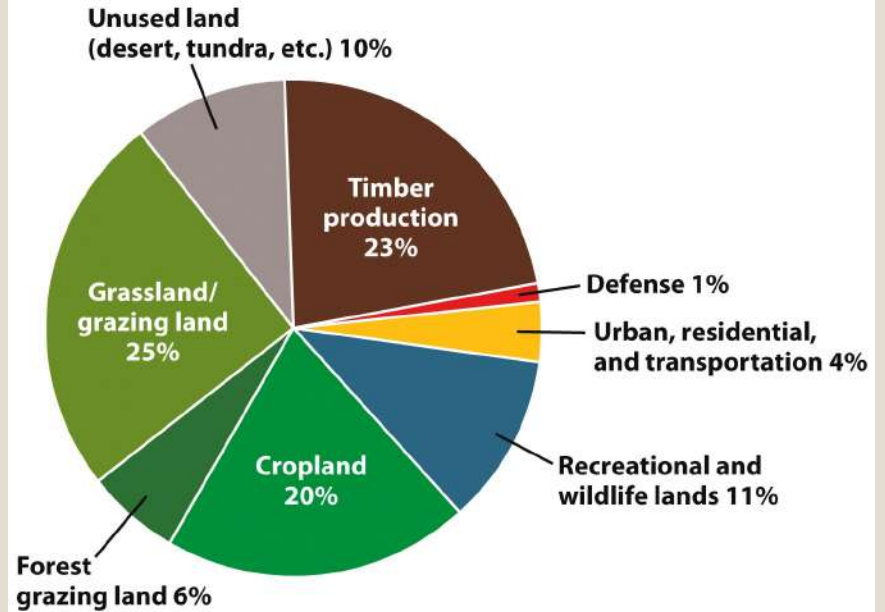


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# Public Land Classification

- Most environmental policies, laws, and management plans have been based on **Resource Conservation Ethic**
  - Calls for policy makers to consider the instrumental value of nature
  - People should maximize resource use based on the greatest good for everyone
  - Areas are preserved and managed for economic, scientific, recreational, and aesthetic purposes
- **Multiple-Use Lands:**
  - Because purposes conflict → adopted principle of multiple use in managing its public resource
  - Can be used for recreation, grazing, timber, harvesting, and mineral extraction



# Agencies

- Bureau of Land Management (BLM):
  - Grazing, Mining, Timber harvesting, Recreation
- United States Forest Service (USFS):
  - Timber harvesting, Grazing, Recreation
- National Park Service (NPS):
  - Recreation, Conservation
- Fish and Wildlife Service (FWS):
  - Wildlife conservation, Hunting, and Recreation



## 10/29 Human Land Use CH 10

Obj. TSW identify and explain how rangelands and forests are managed and which agency manages them P. 22 NB

1. Explain how Rangelands are managed and who manages them if they are public land?
2. What are the ways in which timber is harvested in US forests? Who manages them if they are public land?

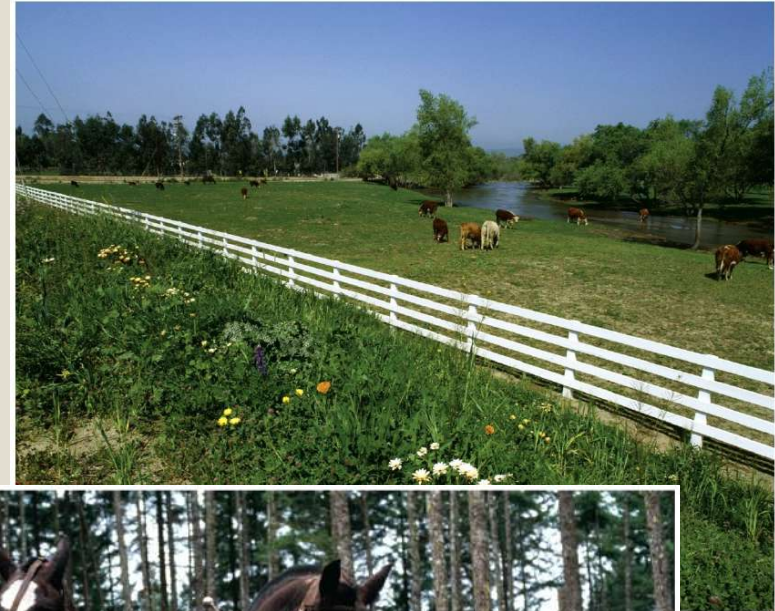


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# Rangelands (BLM)

- Dry, open grasslands that are primarily used for cattle grazing.
- When it is poorly managed, overgrazing can strip the land of vegetation, decrease the rate of regrowth, & increase compaction of soil.
- Lack of vegetation increase the rate of erosion by wind and valuable nutrients and soil can blow away.



**Figure 10.7**  
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# Forests (USFS, BLM)

- Areas dominated by trees and other woody vegetation.
- Sustainable forestry, although not profitable using a team of Shire horses.
- Commercial logging companies allowed to use US National Forests, in exchange for a royalty (% of revenues)



Figure 10.10  
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# Timber Harvest Practices

- **Clear-cutting**- removing all, or almost all the trees in an area.
- **Selective cutting**- removing single trees or relatively small numbers of trees from a forest.



↓ Regrowth



(a) Clear-cutting



↓ Regrowth



(b) Selective cutting

**Figure 10.8**  
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# Clear Cut Forest

Eureka CA

Damaging Effects of clear cutting:  
Increased erosion,  
decreased  
regeneration of  
vegetation, habitat  
destruction, sensitive  
species are  
threatened.



**Figure 10.9**  
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# Fire Management

- Prescribed burns- A fire is deliberately set under controlled conditions.
- Yellowstone 1988 fire was started by a combination of human activity and lightning strikes.
- More than 1/3 of Yellowstone burned.
- Created new, nutrient rich habitat= provided many benefits to the ecosystem



Figure 10.11a  
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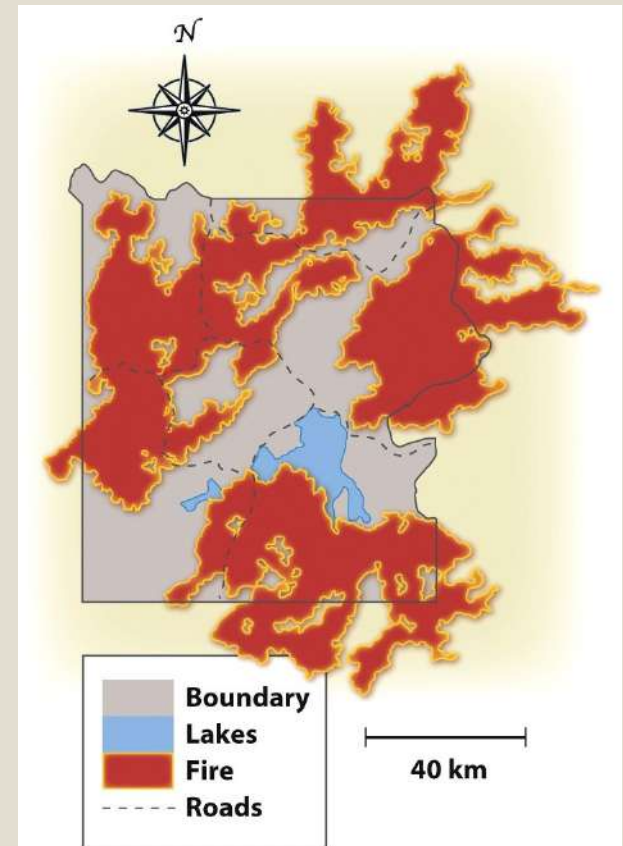


Figure 10.11b  
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# After Quiz Pick up...

- Notebook: 35 points
- CH 11 MC SG, pg. 29 NB, due Tuesday (11/4)
- CH 11 Vocab/2 AXES paragraphs, pg. 31 NB, due Wednesday (11/5)
- How Many Planets? Worksheet, pg. 27
- Reminder: Permeability and Porosity Labs **Due Tomorrow!!!**



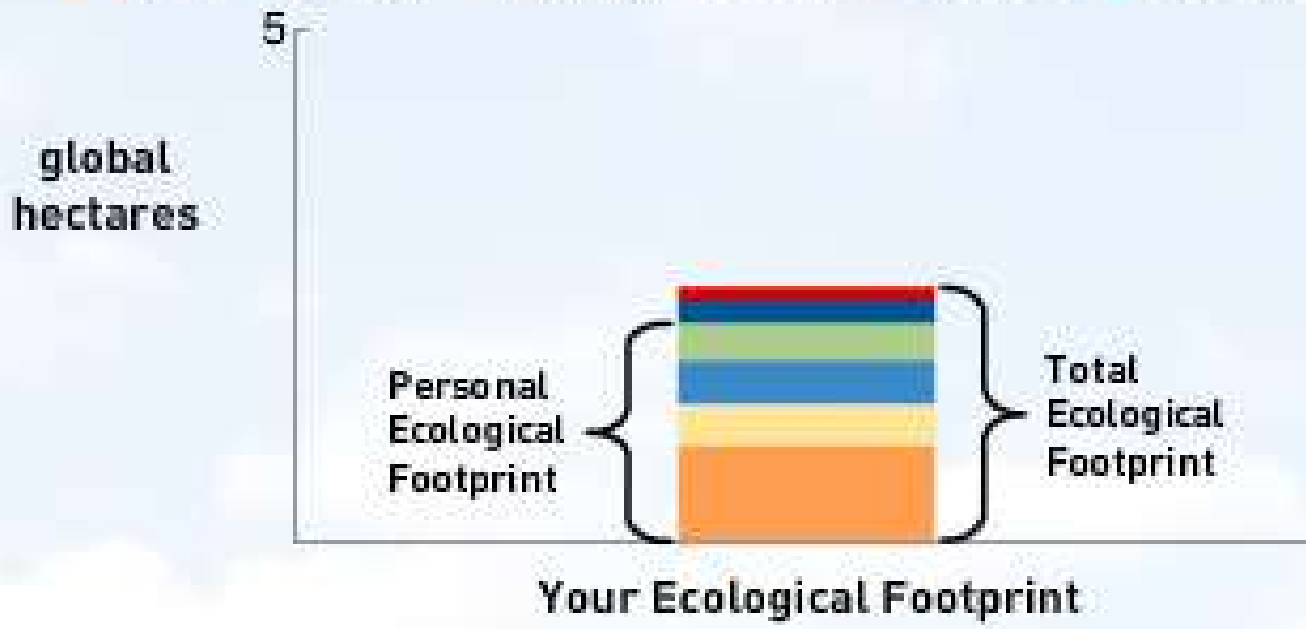
# How Many Planets? (25 points total)

- (5 points) Pre-reading “World Footprint” Article
- Work individually (BUT 3 groups of 2)
- **Worksheet and How Many Earths? Google Form**
  - Fill out worksheet (5 points)
  - Google form (5 points)
  - Individually complete answers at the end of worksheet (8 points)
- Ticket out turn to me before leaving (2 points)
- Turn everything in to ME by Friday (10/31)!

# Question 10e (Instead of pie chart, will look like this):

## Which areas of your Footprint are the largest?

Food Shelter Mobility Goods Services Governance



# Ticket out

- On a scratch piece of paper, answer the following:
- What about this activity did you like?
- What about this activity would you improve for classes next year?

## In the News...

# Here's How San Francisco is Bracing for Sea Level Rise Estimated to Impact \$48 Billion in Assets

*By Zoe Sullivan*

October 24, 2014 | 3:40 pm

San Francisco's Capital Planning Committee (CPC) has adopted what is being called the most comprehensive **guidelines** in the nation for preparing for the impacts of sea level rise on a city's infrastructure.

"This is the first time that I've seen a city really actively assessing the risks to new public investments," Jessica Grannis of Georgetown's Climate Center told VICE News.

The guidelines assume sea level rise of 11 inches, plus or minus 4 inches, by 2050 and as much as 66 inches by 2100.

San Francisco's Pacific coastline, the Embarcadero, a roadway and pedestrian promenade along the city's eastern and northern coastline, the Port of San Francisco, and the San Francisco International Airport already experience periodic flooding.

Under the guidance, which was adopted by the CPC in September, each city department is required to assess the impact of sea-level rise when improvements to existing infrastructure are being considered and when developing new capital projects, such as a police station, visitor center, or a shoreline park.

It requires the departments to estimate the amount of sea-level rise for the proposed location, the potential impact of storm surges, and the likelihood of flooding.

# 10/30 Residential Land Use is Expanding CH 10

Obj. TSW explain and distinguish between urban, rural, and suburban areas and relate the causes and effect of urban sprawl to smart growth practices in new development. P. 24NB

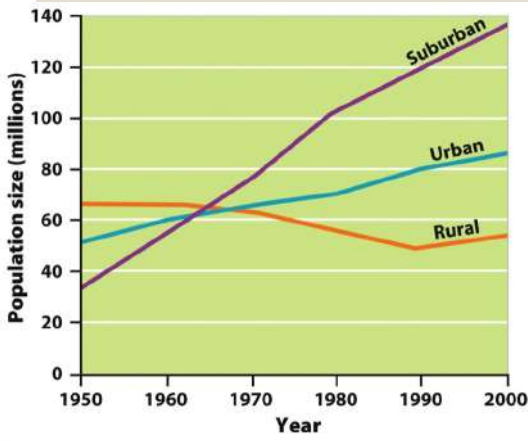


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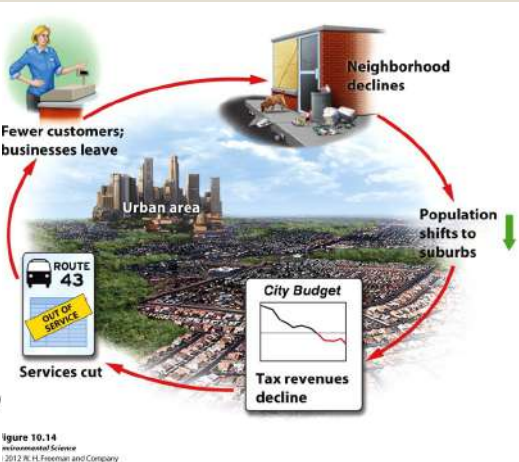


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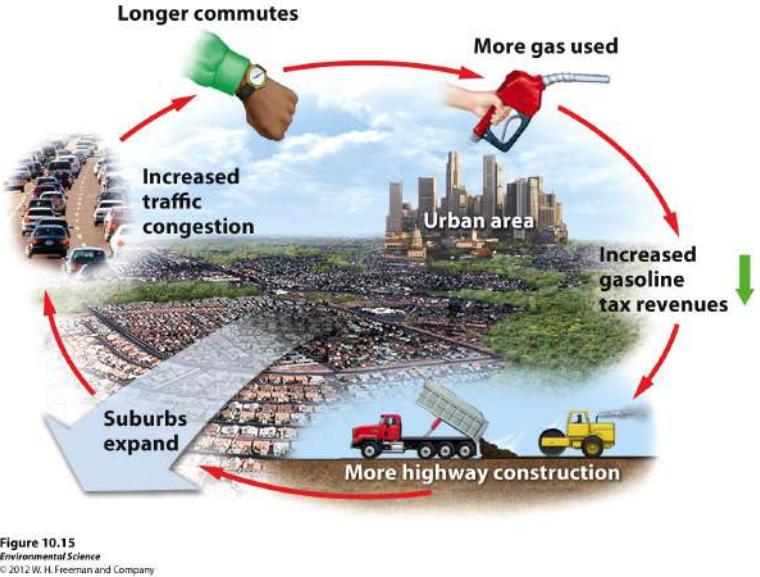


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1. Explain NEPA and what they require before a project can begin.
2. Identify and explain what the 4 main causes of Urban sprawl?
3. List 3 of the 10 basic principles of smart growth.

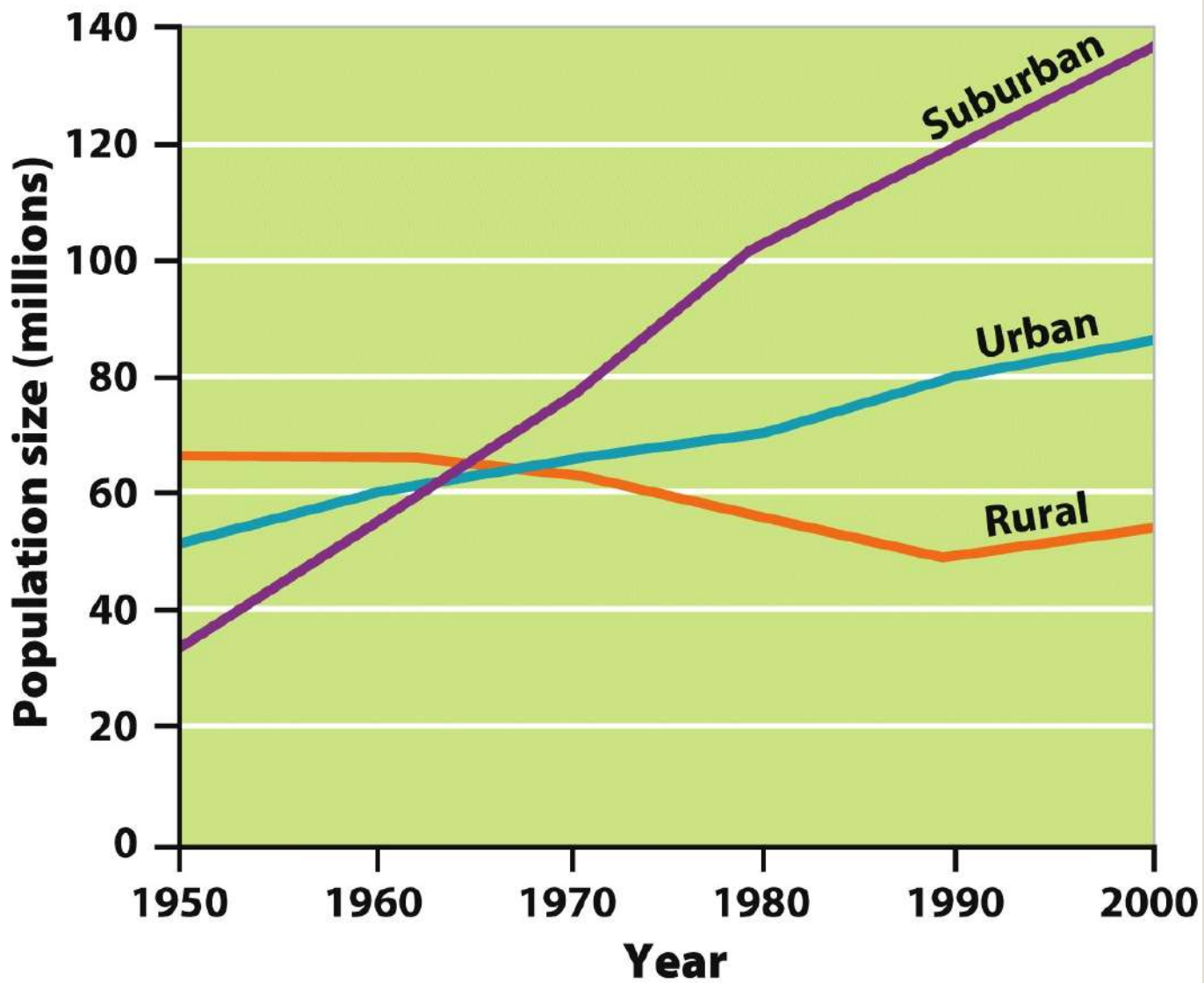
# Federal Regulations

- **National Environmental Policy Act (NEPA)**- mandates an environmental assessment of all projects involving federal money or permits.
- **Environmental impact statement (EIS)**- outlines the scope and purpose of the project.
- **Environmental mitigation plan**- outlines how the developer will address concerns raised by the projects impact on the environment.

# Residential Land

- Suburban- areas surrounding metropolitan centers with low population densities.
- Exurban- similar to suburban areas, but are not connected to any central city or densely populated area.





**Figure 10.13**

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# Urban Sprawl

- Urban sprawl- the creation of urbanized areas that spread into rural areas.
- The four main concerns of urban sprawl in the U.S. are:
  - Automobiles and highway construction
  - Living costs (people can get more land and a larger house in the suburbs for the same amount of money)
  - Urban blight (city revenue shrinks as people move to the suburbs)
  - Government policies

# Smart Growth

- Mixed land uses
- Create a range of housing opportunities and choices
- Create walkable neighborhoods
- Encourage community and stakeholder collaboration in development decisions
- Take advantage of compact building design
- Foster distinctive, attractive communities with a strong sense of place
- Preserve open space, farmland, natural beauty and critical environmental areas
- Provide a variety of transportation choices
- Strengthen and direct development toward existing communities
- Make development decisions predictable, fair and cost-effective

# Light Rail System



**Figure 10.17**  
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# 10/31 Sustainability CH 10

Obj. TSW explain and give examples of how individuals, communities, & cities can work toward being sustainable. P. 26 NB



1. What is urban blight, what examples can you come up with in West Sac?
2. Describe in your own words "Eminent domain."
3. What actions did the Dudley Street Neighborhood Initiative do?



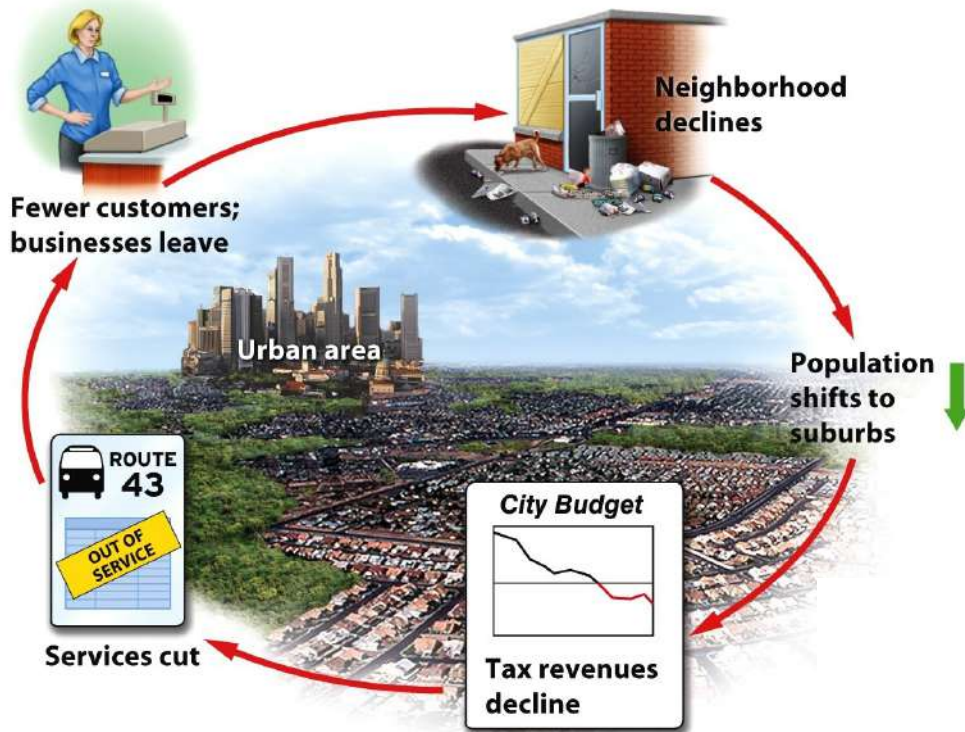


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# Urban Blight

# Urban Sprawl

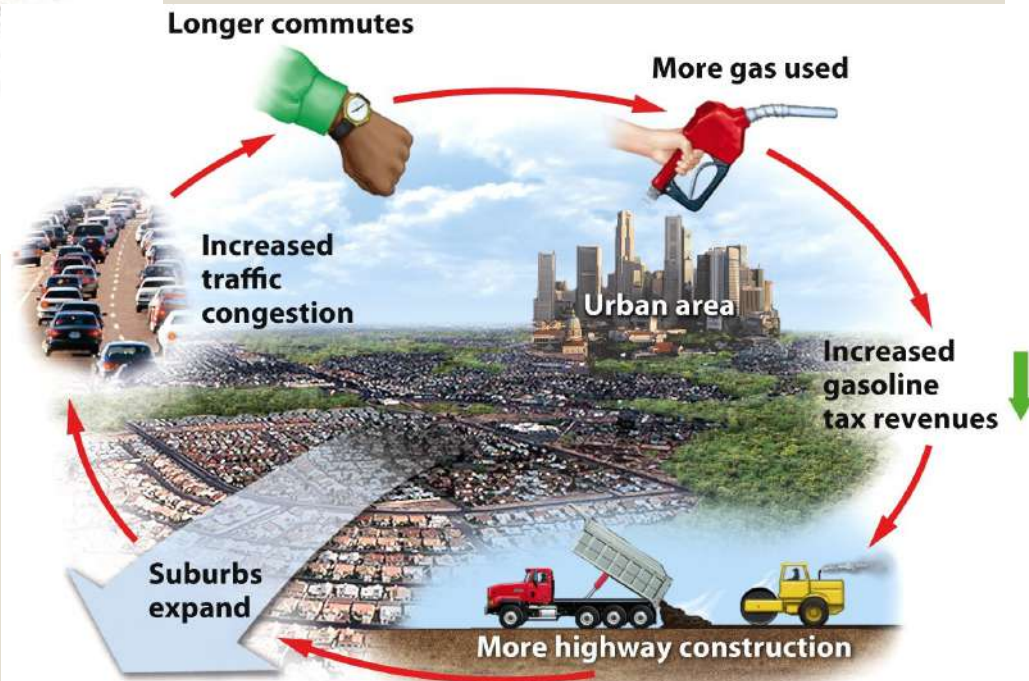


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# Eminent Domain



**Figure 10.18**

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# Government Policies

- Highway Trust Fund- a federal gasoline tax to pay for construction and maintenance of roads and highways.
- Zoning- a planning tool to create quieter and safer communities. For example, prohibiting the development of a factory or strip mall in a residential area.
- Multi-use zoning- allows retail and high-density residential development to coexist in the same area.
- Subsidized mortgages- low interest rates offered to people to purchase a home that would otherwise not be able to do so.

# The French Quarter of New Orleans



**Figure 10.16**

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# Emerald Jewel Wasp Video

# TED Talk