



Wild animals are not pets...many people lose all common sense when interacting with big, dangerous animals.



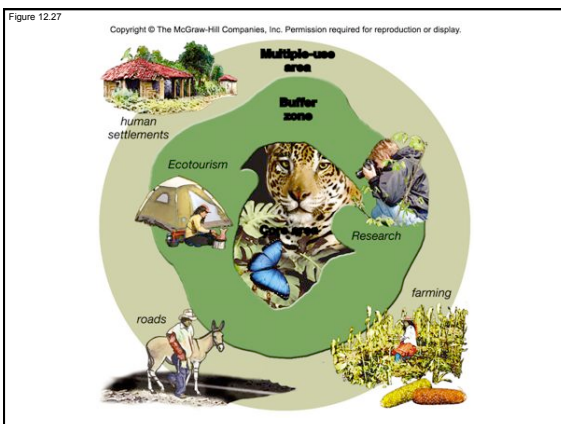
Thousands of people wait for an eruption of Old Faithful geyser in Yellowstone National Park.



Soil preservation or recreation...is one more important?

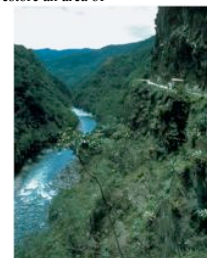


Some parks take excessively severe measures to expel residents and prohibit trespassing.



Forest issues: Debt for Nature

- Developing countries have a lot of debt (\$1 trillion).
- There is little prospect of ever collecting much of this debt.
- Conservation organizations buy debt obligations and then offer to cancel the debt if the debtor country agrees to protect or restore an area of biological importance.
- For example: Conservation International bought \$650,000 of Bolivia's debt for \$100,000 (85% discount). In exchange for canceling the debt, Bolivia agreed to protect nearly 2.5 million acres around the Beni Biosphere Reserve in the Andean foothills.
- Critics say that these swaps compromise national sovereignty, do little to reduce the country's debt, and do little to change the situation that led to the environmental destruction in the first place.



Forest issues: Building roads



<p>1975</p> <p>Good</p> <ul style="list-style-type: none"> • Allow access for recreation • Allow for forest management • Allow for fire prevention 	<p>1989</p> <p>Bad</p> <ul style="list-style-type: none"> • More access means more farmers, miners, hunters, and deforestation • More soil erosion and turbidity 	<p>2001</p>
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Forest issues: Fire suppression



U.S. Forest Service

Forest issues: Fire suppression

- Aggressive control (1930s, Smokey the Bear)
- Many biological communities use fire for regeneration
- Elimination of woody debris to accumulate.
- Recommendations:
 - Private citizens need to use common sense (ex: no wood shingles for a house surrounded by dense forest...use a metal roof, brick or stone walls and clear 200 ft. around)
 - Prescribed burns or forest thinning to remove fuel

Forest issues: Save old growth and spotted owls



Forest issues: Save old growth and spotted owls



Forest issues: Harvest timber



Effects of clear-cutting in the state of Washington.



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Early timber harvest in Mason County (1901)

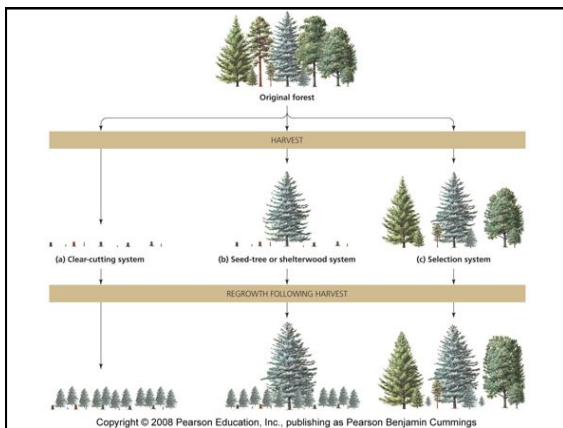


Figure 12.12

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Courtesy of R.O. Bierregaard

Draft Criteria for Sustainable Forestry


1. Conservation of biological diversity
2. Maintenance of productive capacity of forest ecosystems
3. Maintenance of forest ecosystem health and vitality
4. Maintenance of soil and water resources
5. Maintenance of forest contribution to global carbon cycles
6. Maintenance and enhancement of long-term socioeconomic benefits to meet the needs of legal, institutional, and economic framework for forest conservation and sustainable management

Green certified programs:

- Forest Stewardship Certification (FSC) (preferred by Home Depot...deals with indigenous people's rights, social and economic well-being, reduction of env. impact, having and monitoring a management plan, and promoting restoration and conservation)
- Sustainable Forestry Initiative (SFI)




Environmental Quiz



Most recent update August 1, 2007


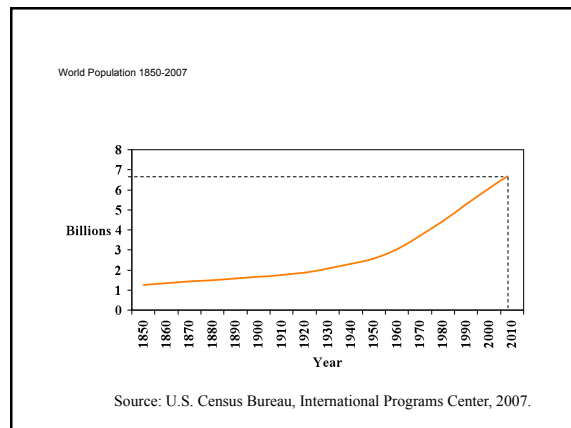
The population of the world is currently about:

- 3.4 billion
- 6.6 billion
- 8.7 billion
- 9.2 billion
- 11.5 billion




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The population of the world is currently increasing at a rate of about 8,836 people per:



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Rate of Population Increase - 2007

<u>Time Unit</u>	<u>Population Increase</u>
Year	77,401,492
Month	6,450,124
Week	1,484,413
Day	212,059
Hour	8,836
Minute	147
Second	2.5

Source: U.S. Census Bureau, International Division, 2007.

True (T) or False (F):

The United States is a net exporter of most raw materials used by industry today.



True (T) or False (F):


The United States is a net exporter of most raw materials used by industry today.




Due in part to domestic environmental concerns, the U.S. is a net **importer** of most categories of raw materials used to support our economy and lifestyle.

- Most metals
- Portland and masonry cement
- Petroleum (the basis for plastics)
- Wood and wood products

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2006, and by Major Foreign Sources

 <u>Material</u>	<u>% Imported</u>	<u>Principal Foreign Sources</u>
Columbium	100	Brazil, Canada, Estonia, Germany
Mica (natural)	100	India, Belgium, China, Brazil
Manganese	100	S. Africa, Gabon, Australia, China
Graphite	100	China, Mexico, Canada, Brazil
Strontium	100	Mexico, Germany
Bauxite/Alumina	100	Jamaica, Guinea, Australia, Brazil
Fluorspar	100	China, Mexico, S. Africa, Mongolia
Yttrium	100	China, Japan, France, Austria
Thallium	100	Russia, Belgium
Rubidium	100	Canada
Asbestos	100	Canada
Quartz (crystal)	100	Brazil, Germany, Madagascar, Canada

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2006, and by Major Foreign Sources

 <u>Material</u>	<u>% Imported</u>	<u>Principal Foreign Sources</u>
Arsenic (trioxide)	100	China, Morocco, Mexico, Chile
Indium	100	China, Canada, Japan, Russia
Rare earth metals	100	China, France, Japan, Russia
Cesium	100	Canada
Vanadium	100	Czech Rep., Swaziland, Canada, Austria
Gallium	99	China, Japan, Ukraine, Russia
Gemstones	99	Israel, India, Belgium, S. Africa
Bismuth	96	Belgium, Mexico, China, UK
Platinum Group	95	S. Africa, UK, Germany, Canada
Stone (dimension)	89	Italy, Turkey, China, Mexico
Antimony	88	China, Mexico, Belgium
Tantalum	87	Australia, Canada, China, Japan
Rhenium	87	Chile, Germany

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2006, and by Major Foreign Sources



Material	% Imported	Principal Foreign Sources
Barium (Barite)	83	China, India
Palladium	82	Russia, S. Africa, UK, Belgium
Diamond (indust)	82	Ireland, Botswana, Ghana, Belgium
Cobalt	81	Norway, Russia, Finland, Canada
Potash	80	Canada, Belarus, Russia, Germany
Tin	79	Peru, Bolivia, China, Indonesia
Chromium	75	S. Africa, Kazakhstan, Zimbabwe,
Iodine	74	Chile, Japan, Russia
Titanium (sponge)	72	Kazakhstan, Japan, Russia
Titanium concentrates	71	S. Africa, Australia, Canada, Ukraine
Tungsten	66	China, Canada
Silver	65	Mexico, Canada, Peru, Chile

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2006, and by Major Foreign Sources



Material	% Imported	Principal Foreign Sources
Petroleum	60	Canada, Saudi Arabia, Mexico, Venezuela, Nigeria
Silicon	60	Canada, Venezuela, Russia, Norway
Nickel	60	Canada, Russia, Norway, Australia
Magnesium Metal	54	Canada, Russia, China, Israel
Garnet (industrial)	53	Australia, India, China, Canada
Magnesium Cpds	53	China, Canada, Australia, Austria
Diamond (dust, grit)	51	China, Ireland, Ukraine, Russia
Lithium	>50	Chile, Argentina
Aluminum	44	Canada, Russia, Venezuela, Brazil
Nitrogen (fixed)	42	Trinidad and Tobago, Canada, Russia
Copper	40	Chile, Canada, Peru, Mexico
Lumber (softwood)	36	Canada, EU, Chile, N. Zealand,

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2006, and by Major Foreign Sources



Material	% Imported	Principal Foreign Sources
Perlite	35	Greece
Vermiculite	31	S. Africa, China
Mica	30	Canada, China, India, Finland
Gypsum	27	Canada, Mexico, Spain, Dominican Rep
Sulfur	26	Canada, Mexico, Venezuela
Cement (Port/mstry)	24	Canada, Thailand, China, Venezuela
Iron and steel	21	Canada, EU, Mexico, Brazil
Wood/Wd. Prod.	20	Canada, China, Indonesia, Finland, N. Zealand, Chile, Brazil
Salt	16	Canada, Chile, The Bahamas, Mexico
Pumice	12	Greece, Italy, Turkey
Talc	11	China, Canada, France, Japan

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2006, and by Major Foreign Sources



Material	% Imported	Principal Foreign Sources
Iron ore	5	Canada, Brazil, Chile, Australia
Lead	2	Canada, Australia, China, Mexico
Sand and gravel	1	Canada, Mexico, The Bahamas

Also significant import dependency for Thorium, Iron and steel slag, Germanium, Leather, Natural Rubber, Selenium, Wool, Zirconium.

Source: US Geological Survey, 2007.




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The raw material that is used in the greatest quantity in the U.S. today, and which accounts for almost one-third (by weight) of the total raw materials used annually is steel.



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Annual U.S. Consumption of Various Raw Materials, 2005


	Million	
	Metric tons	Million m ³
Roundwood	249	560
Industrial roundwood	227	516
Cement	126	114
Steel	122	154
Plastics	39.1	34.5
Aluminum	6.8	2.4

Source: Data for wood from USFS (2006); for cement, steel, and aluminum from the U.S. Geological Survey (2006); and for plastics from the American Plastics Council (2006).

In fact, more wood is used in the U.S. every year than all metals and all plastics combined!

The number one cause of tropical deforestation worldwide is:


- commercial logging.
- wildfire.
- clearing of lands for agricultural use.
- gathering of firewood.
- building of roads and cities.




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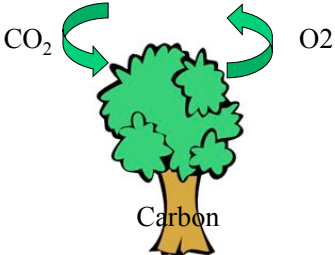
Various estimates indicate that 60 to 85% of tropical deforestation today is due to permanent and shifting agriculture.



carbon dioxide from the air and release oxygen.



True (T) or False (F). Growing trees capture carbon dioxide from the air and release oxygen.



Which of the following statements most accurately describes U.S. forests:

- Forest harvest exceeds growth by 8 percent.
- Forest harvest exceeds growth by 3 percent.
- Forest harvest roughly equals growth.
- Forest growth exceeds harvest by 29 percent.
- Forest growth exceeds harvest by 67 percent.



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Growth/Removals Ratios – U.S., 1952-2001

Year	Softwoods	Hardwoods	Total
1952	1.00	1.50	1.17
1962	1.25	1.65	1.55
1970	1.23	2.01	1.48
1976	1.25	2.25	1.54
1986	1.19	1.92	1.42
1991	1.15	1.75	1.33
1996	1.33	1.71	1.47
2001	1.33	1.71	1.47
2006	1.51	1.95	1.67*

Source: Smith, et al., 2004; * Preliminary from 2006 EIA

True (T) or False (F):

As originally established, it was never intended that the National Forests of the U.S. would be periodically harvested to obtain timber that would be used in meeting the nation's need for wood.

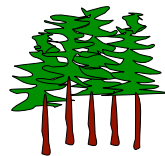


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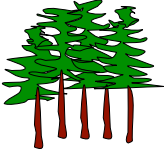
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True (T) or False (F). At current rates of deforestation, forty (40) percent of current forests in the U.S. will be lost by the middle of the next century.




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In fact, the area covered by forests in the U.S. is increasing.

True (T) or **False (F)**. Under current United States law, forest harvesting is allowed in federally designated wilderness areas.




True (T) or **False (F)**. Under current United States law, forest harvesting is allowed in federally designated wilderness areas.




No harvesting is allowed in wilderness areas

True (T) or **False (F)**. Populations of elk, pronghorn antelope, and wild turkey have declined significantly in the U.S. over the past 60 years.



True (T) or **False (F)**. Populations of elk, pronghorn antelope, and wild turkey have declined significantly in the U.S. over the past 60 years.

In fact, populations of each of these species within the U.S. have increased by at least 800 to 1,000 percent over the past 50 years.




Trends in U.S. Elk Populations 1930-1990

Trends in U.S. Wild Turkey Populations 1900-1990

Trends in U.S. Pronghorn Populations 1910-1990

As a percentage of all the paper used in the United States in 2006 _____ was recovered for reuse.



- 2.9 percent
- 6.5 percent
- 14.7 percent
- 29.3 percent
- 53.4 percent
- 66.1 percent

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Recovered paper provided _____ of the U.S. paper industry's fiber in 2006.



- 2.0 percent
- 6.1 percent
- 12.9 percent
- 19.8 percent
- 24.3 percent
- 36.9 percent

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True (T) or False (F). More extensive recycling of paper could reduce harvesting of forests in the U.S. by 60 percent or more.

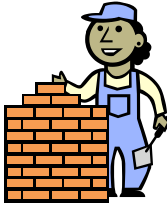


True (T) or False (F). More extensive recycling of paper could reduce harvesting of forests in the U.S. by 60 percent or more.



Were paper recycling in the U.S. to go to the limit of technology worldwide the domestic timber harvest could be reduced by about 12-13%.

The building material that can be produced with the least impact on the environment is:



- brick
- concrete
- aluminum
- virgin steel
- recycled steel
- wood
- plastic

The manufacture and use of all construction materials results in environmental impacts. The impacts, differ considerably however.

If, for example, an interior wall of a house is constructed using steel rather than wood studs, the result is a large increase in energy consumption and emissions to air and water.

Comparative Emissions in Manufacturing Wood vs. Steel-Framed Interior Wall

<u>Emission/Effluent</u>	<u>Wood Wall</u>	<u>Steel Wall</u>
CO2 (kg)	305	965
CO (g)	2,450	11,800
SOX (g)	400	3,700
NOX (g)	1,150	1,800
Particulates (g)	100	335
VOCs (g)	390	1,800
Methane (g)	4	45

Source: Athena Sustainable Materials Institute, 1993.

Comparative Effluents in Manufacturing Wood vs. Steel-Framed Interior Wall

<u>Emission/Effluent</u>	<u>Wood Wall</u>	<u>Steel Wall</u>
Suspended solids (g)	12,180	495,640
Non-ferrous metals (mg)	62	2,532
Cyanide (mg)	99	4,051
Phenols (mg)	17,715	725,994
Ammonia (mg)	1,310	53,665
Halogenated organics (mg)	507	20,758
Oil and grease (mg)	1,421	58,222
Sulphides (mg)	13	507

Source: Athena Sustainable Materials Institute, 1993.