



Lesson 2: Why Are Rangelands Important?

What is the Extent of Rangelands?

Approximately 47% of the earth is rangeland and 36% of the United States is rangeland. Rangeland makes up 53% of the land in Western States (land west of the Mississippi River). According to UN-L Department of Agronomy, rangeland ecosystems occupy nearly half (46%) of Nebraska's land area.

What Economic Benefits Do Rangelands Provide?

In Nebraska, the primary use of rangelands is for livestock grazing – mostly cattle. The beef cattle industry contributes approximately \$12 billion to the Nebraska economy each year. In 2017, cattle numbers were estimated at 6.8 million head which ranked 2nd in the nation. Cattle outnumber people in Nebraska by nearly 4 to 1.

The top three beef cow counties in the U.S. are located in Nebraska. Cherry County is the nation's top cow county with nearly 166,000 beef cows. Custer county is number 2 and Holt County is number 3.

According to the Nebraska Agriculture Fact Card, in 2017, Nebraska ranked first in the nation in beef and veal exports. These exports were valued at more than \$1.2 billion. Total cash revenue from all livestock and products exceeded \$12 billion.

Rangelands can be managed to provide additional economic benefits such as fee hunting, eco-tourism, wool production and other food products such as mutton and honey.

What other Ecosystem Services Do Rangelands Provide?

The many benefits to humans and other organisms that can be derived from the land are known as ecosystem services. Ecosystem services are divided into four categories: provisioning, regulating, cultural, and supporting.

Provisioning ecosystem services are those that can be directly harvested, provide for immediate human needs and have a market value. These services include food (meat and milk), fiber (leather and wool for clothing), fuel (wind and solar energy, fossil fuels, hydropower), medicines, and freshwater (drinking and irrigation).

Regulating ecosystem services provide more indirect needs and include benefits like carbon sequestration, air and water quality, water capture, pollination, soil quality, and erosion control.

Cultural ecosystem services are nonmaterial benefits that we obtain from the land and include cultural, spiritual and religious values, scientific and educational benefits and recreation.

Supporting ecosystem services provide the fundamental basis for all ecosystems and their services. Supporting ecosystem services include forage production, nutrient cycling, energy cycling, water cycling, soils formation, wildlife habitat and biodiversity.

Rangelands can be managed to provide all of the listed ecosystem services. Multiple ecosystem services may be affected when implementing a management strategy.



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What Are Some of the Challenges to Nebraska's Rangelands?

Woody Encroachment: In the Great Plains, woody encroachment is a threat to rangelands. Eastern red cedar is a native plant, but removal of fire from the landscape has increased the extent of this plant across much of the Great Plains.

In Nebraska nearly 500,000 acres of rangeland have been converted to eastern red cedar woodland. This has had an estimated negative economic impact of \$18.7 million. This conversion to woodland reduces forage production, degrades grassland habitat, decreases water yield and increases the intensity of wildfires.

Unsustainable Grazing Practices: When livestock forage demand exceeds forage supply or when plants are re-grazed before recovering the rangeland will decline in productivity. If continued this is unsustainable.

Invasive Plants: Invasive plants thrive and spread aggressively outside their native range. Most of the invasive plants in the U.S. are non-native plants, but some are plants that are native to the U.S. but have been brought into habitats where they didn't naturally occur.

Invasive plants compete with native species for moisture, space, sunlight and nutrients. Invasives can be so competitive that plant diversity is decreased which can degrade wildlife habitat, increase soil erosion and degrade water quality.

The most aggressive invasive plants in Nebraska have been identified as Noxious Weeds. As of 2018, twelve plants have been identified as Nebraska Noxious Weeds. County weed authorities have identified

additional noxious weeds. See Range Topic Lesson 5 for more information about Nebraska's Noxious and Invasive Rangeland Plants.

Human Development: Human development on rangeland encompasses activities that change the land use or reduce the functions of the rangeland. In some parts of the U.S., urban sprawl is a development issue. In other areas, conversion of rangeland to cropland has reduced and continues to reduce the amount of rangeland.

Activities

Look up Nebraska rangeland facts:

<http://www.nda.nebraska.gov/facts.pdf>

<https://agronomy.unl.edu/range-pasture-forages/rangeland-ecology-and-management>

Identify ecosystem services on Nebraska Rangeland:

https://www.fs.fed.us/rm/pubs_other/rmrs_2011_marczko_k001.pdf

<https://www.greenfacts.org/glossary/def/ecosystem-services.htm>

Learn more about the impact of Eastern Red Cedar:

<https://agronomy.unl.edu/eastern-redcedar-science-literacy-project>

Learn why invasive plants are so successful:

List and identify the twelve Nebraska noxious weeds:
http://www.nda.nebraska.gov/plant/noxious_weeds/index.html

Example Questions

Rangeland makes up _____% of Nebraska's land area.

Provisioning ecosystem services include fuel, food, fiber, fuel, medicines and _____.