

Kansas Envirothon Rangeland Information

Rangeland includes native plant communities and those seeded to native or introduced species, or naturalized by introduced species, that are ecologically managed using range management principles.

Rangeland is a type of land which supports different, uncultivated vegetation types which can provide the necessities of life for both native and domestic herbivores in a sustainable fashion. It is a complex relationship between soils, plant communities, and management, and home to both native and domestic animals.

There are approximately 16.6 billion acres of rangeland worldwide or 51% of the earth's surface. Approximately one billion acres of rangeland, pastureland, and forestland exists in the United States. In Kansas alone there is 15.8 million acres of rangeland, 2.5 million acres of pastureland, 3.1 million acres of Conservation Reserve Program acres, and 1.7 million acres of forestland.

Objective One – Range Resource

Principles or objectives:

- Understand the important uses and needs of rangeland in Kansas
- Understand the relationship between soils and different plant communities
- Understand the history of rangelands and their use in Kansas

Activities:

- Determine how rangelands in Kansas are currently used and what threats exist within their boundaries or alongside their boundaries
- Develop an understanding of how different soils or ecological sites support different plants, plant communities, production, and habitat
- Determine how rangelands in their size and use are different today in comparison to 100 years ago.

Questions:

- 1) What different types of prairies exist within Kansas?
- 2) Where does Kansas rank nationally in the number of cattle that graze Kansas rangelands?
- 3) List at least five plant species which are common invaders and threats to rangelands in Kansas.

Reference Material:

- Natural Resources Conservation Service (NRCS) at your local USDA Service Center
- National Range and Pasture Handbook, NRCS, Revision 1, 2003
- Kansas Vegetation Map, Kansas Applied Remote Sensing Program. 2002. Kansas Vegetation Map, Lawrence, Kansas, Kansas Biological Survey, University of Kansas

Objective Two – Range Plants

Principles or objectives:

- Understand the classification, description, and distribution of Kansas plants
- Understand plant morphology
- Understand the value of native plants in Kansas as it relates to feed sources, habitat, and conservation of resources
- Understanding and recognizing poisonous plants
- Identification of native rangeland plants

Activities:

- Discover how native plants are classified, grouped, and named
- Discover how plants grow and reproduce. Learn how different propagation abilities affect the success of plants abilities to reproduce under conditions such as grazing or drought
- Discover the suitability or value of plants for forage, erosion control, soil health, and habitat for domestic animals as well as wildlife

Questions:

- 1) In a rangeland community, which plant below would be considered an invader? Little Bluestem, Switchgrass, Tall Dropseed, or Tall Fescue
- 2) Indiangrass relies on its ability to produce seed annually to sustain its existence in a native grass plant community? True or False
- 3) Big Bluestem, Indiangrass, and Tall Fescue are all rhizomatous grass species. True or False

Reference Material:

- Natural Resources Conservation Service (NRCS) at your local USDA Service Center
- Great Plains Flora Association, 1986, Flora of the Great Plains, University Press of Kansas

- Robert A. Nicholson, 2006, Pasture and Range Plants, Second Edition, Fort Hays State University
- Society for Range Management, 1996, Wildland Plants: physiological ecology and developmental morphology. Society for Range Management, Denver, Co.

Objective Three – Range Ecology

Principles or objectives:

- Plant succession, climax plant communities, state and transition models
- Role of livestock and wildlife in the ecosystem
- Rangeland hydrology, mineral cycle, and energy flow
- Role and effects of fire in the range ecosystem
- Ecological Sites
- Vegetation measurements, inventories, and monitoring

Activities:

- Discover and develop an understanding of biotic and abiotic components of rangeland ecosystems. Investigate the impacts of fire, positive and negative management impacts and how land managers or good stewards, must understand the interaction between both natural and manmade plant community drivers.
- Discover the responsibility of managers to know the types of plants which either exist or should exist in the plant communities they manage and how sampling or monitoring is necessary to guide decision making.

Questions:

- 1) The fire triangle for prescribed fire on rangeland include what three elements from the following list: fuel, animals, slope, oxygen, and ignition source or heat
- 2) How does management impact the transition of plant communities from one state to another? Ex. Tallgrass/Midgrass dominant to Midgrass/Shortgrass dominant
- 3) How do changes in plant communities affect rangeland hydrology?
- 4) What is a monitoring tool which allows a producer to identify species composition on the land they manage?

References:

- Society for Range Management. Assessment of Rangelands and the Trend of the United States. Denver, Co.

- Herrick, Jeffrey E., Van Zee, Justin W., Havstad, Kris M., Burkett, Laura M., and Whitford, Walter G., Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems

Objective Four – Rangeland and the Livestock Industry

Principles or Objectives:

- Relationship of livestock and rangeland
- Grazing effect on plants
- Range Condition or Similarity Index
- Determining stocking rates
- Monitoring and making adjustments to management
- Grazing Systems
- Livestock distribution
- Range Improvement practices

Activities:

- Discover the relationship between grazers, grazing managers, and the vegetation being grazed
- Discover the benefits of using monitoring techniques such as rangeland health
- Research and discover the different types of grazing systems applied since the early years of domestic livestock grazing to the current types of grazing systems used or promoted
- Discover and develop your understanding of how livestock grazing can be detrimental and beneficial to the enhancement of wildlife habitat
- Discover why public grazing lands and their use are often times scrutinized or controversial

Questions:

- 1) What parts of a plant especially grasses are first selected by grazing animals such as cattle?
- 2) Stocking rates are generally described in the following units:
 - Au/kg or Au/lb
 - Aum/ha or Aum/ac
 - Au/ha or Au/ac
 - Kg/ha or lb/ac
- 3) What type of knowledge is necessary in order to design or create a grazing system which benefits specific wildlife?

References:

- Heitschmidt, R.K. and J.W. Stuth. 1991. Grazing Management: An Ecological Perspective, Timber Press, Portland, Or.
- Holechek, J.L., R.D. Piper, and C.H. Herbel. 1995. Range Management Principles and Practices. Prentice Hall

Objective 5 – Range and the Environment

Principles or objectives:

- Different species of animals which inhabit rangelands of Kansas
- Native rangelands serving as both food and habitat for animals
- Management styles benefitting wildlife, including improvements
- Wildlife/Livestock interactions
- Role of rangeland in environmental protection
- Effects of Human use

Activities:

- Develop a list of different uses native rangeland is used for in Kansas
- Discover how land manager decisions impact the perception of the public
- Discover what management techniques are used to improve or benefit livestock and wildlife species on rangeland

Questions:

- 1) What are the primary drivers which have historically maintained native rangelands in the state or condition they are today?
- 2) What ecological drivers are necessary to keep the Flint Hills of East Central Kansas a tall grass prairie?
- 3) Is fire a useful tool in maintaining rangeland areas of western Kansas?

Resources:

- Heitschmidt, R.K. and J.W. Stuth. 1991. Grazing Management: An Ecological Perspective. Timber Press, Portland, Or.
- Society for Range Management. Grazing Land Hydrology Issues: Perspectives for the 21st Century. Denver Colorado
- Society for Range Management. Coordinated Resource Management Guidelines. Denver, Colorado

Question Answers:

1.1 – Tall grass, Mixed grass, short grass, sand-sage prairie, 1.2 - Second in total cattle, sixth in beef cow numbers, 1.3 – Eastern Red Cedar, Smooth Brome, Tall Fescue, Old World Bluestems, Sericea Lespedeza, Annual Brome

2.1 – Tall Fescue, 2.2 – False, 2.3 – False

3.1 – Fuel, Oxygen, Ignition Source or heat, 3.2 – Extensive or continuous grazing pressure, 3.3 – When plant communities change or shift to less diverse plant communities the soil surface and root systems below surface change not allowing for moisture which is received to enter the soil profile as effectively as diverse native plant communities, 3.4 – Line point intercept or line transect

4.1 – Leaves, 4.2 – Au/ha, Au/ac, Kg/ha, or lb/ac, 4.3 – Specifically what type of habitat is necessary to meet the needs of the target wildlife species in description of what type, what amount, height, density, etc.

5.1 – Grazing, fire, and climate, 5.2 – Grazing and fire, 5.3 Yes, however the frequency of its use will typically be less than regions to the east