CHP E&O Lesson Plan for Jayne Jonas

BIOL810 Grassland Fire Ecology & Management

Course learning outcomes

At the completion of this course, you will be able to

1. Use common wildland fire terminology to describe key characteristics of fuels, weather, and topography contributing to fire behavior in wildland environments, with particular emphasis on grasslands.
2. Recognize adaptations of plant and animal species driving grassland community and ecosystem responses to fire.
3. Identify characteristics of fire as a key disturbance in grasslands.
4. Recognize how prescribed fire can be used as a management tool to maintain and restore grasslands.

Week 5 Module: Fire-grazing synergism in grasslands

Student workload

- Target: 6-8 hours/week
- Estimated as planned: 6.5 – 7.5 hrs

Module Objectives

1. Describe the co-evolutionary relationship between herbivores and plants in grasslands.
2. Consider similarities and differences in plant responses to defoliation by herbivores versus fire.
3. Explain the synergistic relationship between fire and grazing in humid and subhumid grasslands.
4. Summarize ways grassland responses to fire and the fire-grazing synergism vary with regard to climate, seasonality, and vegetation.

Content

Mini-lectures [time on tasks: ~0.83 hrs]

- Grazers, grasses, and grasslands (~15 minutes)
    - Focus: Module objectives 1 and 2
- Fire-grazing synergism: the basics (~15 minutes)
    - Focus: Module objective 3

- Fire-grazing synergism: modifiers (~15 minutes)
    - Focus: Module objective 4

Readings [time on tasks: ~2.1 hrs]

1. Smit, IPJ, Coetsee, C. 2019. Interactions between fire and herbivory: current understanding and management implications. Pp. 301-319, In: Gordon, IJ, Prins HH (Eds). The Ecology of Browsing and Grazing II. Springer, Cham. Doi: 10.1007/978-3-030-25865-8. [~85 minutes]
    - [Optional] Section 13.3.2 Fire x Browsing Interaction in Woody Systems
    - Module objectives 3, 4
2. Wilcox, BP, Fuhlendorf, SD, Walker, JW, Twidwell, D, Wu, XB, Goodman, LE, Treadwell, M, Birt, A. 2021. Saving imperiled grassland biomes by recoupling fire and grazing: a case study from the Great Plains. Frontiers in Ecology and the Environment. 20, 179-186. DOI; 10.1002/fee.2448. [~40 minutes]
    - Module objectives 2, 3

External Videos [time on tasks: ~0.27 hr]

1. How bison are saving America's lost prairie, PBS [8:28] https://www.youtube.com/watch?v=HuYGSrGLeZE
2. Patch burn and livestock grazing research [7:57] https://www.youtube.com/watch?v=ElbusV6kdnc

Activities/Assessments [time on tasks: ~3 – 4.5 hrs]

1. Literature Review Project Assignment D 10 points (see PDF)
    - [estimated 180 minutes time on task]
2. Discussion
    - [estimated 30 minutes time on task]
    - Instructions:
        - In your initial post (due Thursday by 11:59 PM CDT), briefly summarize (2-3 sentences or a 2-3 minute video) what you have learned about the role of a fire x grazing synergism in the ecology or maintenance of grasslands in your MLRA (also see Assignment D).
            - Please do not post the annotated bibliography (that is, your Assignment D), but rather please summarize the main points across the papers you have read so far in a few sentences.
            - You may draw and post a conceptual diagram to illustrate interactions.
            - If you share a diagram that you did not create, be sure to include an appropriate citation.

        - In your reply to a classmate (due Sunday by 11:59 PM CDT), compare the relative importance of a fire x grazing synergism between your MLRA and that being studied by your classmate(s). Why do you think they are similar or different?

3. Quiz 15 points (see PDF)
    - Two attempts, 30-minute time limit per attempt.
    - [estimated 40 minutes time on task]