

# **Developing Learning Experiences to Increase Student Understanding of Rangeland Ecosystem Services and the Essential Role of Fire and Herbivory**

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## **Abstract**

Students that understand ecological processes and ecosystem services have the potential to be informed contributors to environmental decision-making in their communities. Students lacking such knowledge are often unaware of the relationships between sustainable resource use and natural systems. One of the primary goals of the Prairie Project is to develop innovative learning activities related to best management practices in rangeland ecosystems in an effort to reduce misconceptions about and to increase knowledge of rangelands and the ecosystem services they provide. The Prairie Project is collaborating with secondary teachers to develop learning experiences that will increase student understanding of rangeland ecosystem services and the supporting role of pyric-herbivory. Teacher participants were recruited through social media announcements, previous collaborations, and outreach to school districts. Intensive summer workshops were used to build learning communities of educators and facilitators to support lesson-development efforts. Monthly meetings are being used to further promote the development, implementation, and assessment of lessons. The essential components of the Prairie Projects lesson-development framework included: 1) a general introduction of science, management practices, and issues relevant to rangelands; 2) teacher decision-making on how to best integrate such concepts in a manner that is appropriate and

meaningful to their classroom situations; 3) identification of academic standards and science practices to be met by the lesson; 4) lesson development with facilitator support providing specific conceptual, technical, and pedagogical guidance along with financial support for materials; 5) lesson implementation in the classroom; 6) assessment of lesson effectiveness; 7) lesson modification for future use; and 8) teacher presentation of lessons and their impacts. As a result of this collaboration, a variety of innovative lessons have been produced, such as research experiences, collaborative activities, case studies, authentic inquiries, and free-response questions. Teachers have presented their lessons and resulting student impacts at professional workshops and conferences. The lessons produced are now available as resources for other instructors to use or modify. Initial comparisons between pre- and post-lesson surveys and results from related assessments indicate that students have experienced a reduction in misconceptions about and an increase in understanding of rangeland ecosystem services and effective rangeland management. In addition, instructors have become agents of change not only in their classrooms but also in their schools, associations, and communities. The Prairie Project's experiences in lesson development could be beneficial to other science communication or public relations efforts related to fire ecology and ecosystem services.

**Keywords:** Education, Curriculum Development, Science Communication, Rangelands, Ecosystem Services, Pyric-Herbivory