

WILD 4000

PRINCIPLES OF RANGE MANAGEMENT

INSTRUCTOR: Dr. Eric Thacker

Wildland Resources

Office: NR 144

email: eric.thacker@usu.edu

ph#: 435-797-7874

CLASS TIME AND LOCATION: T, Th time 10:30-11:45

LOCATION: HPER 116

OFFICE HOURS: T, Th 3:30-5:30; or email me for a specific meeting time.

COURSE DESCRIPTION: The course will focus on synthesizing science and ecological principles that drive the dynamic nature of rangeland ecosystems. Topics will include the history of range management, ecological drivers of rangelands, grazing management, vegetation management and management of rangelands for multiple ecological services.

COURSE OBJECTIVES:

<i>Course Objectives</i>	<i>Learning Objectives (IDEA evaluation)</i>
Develop an understanding of what rangelands are, why they are important, and the role of science in managing rangelands.	1. Gaining factual knowledge such as terminology, classifications, methods, and trends. <i>(Essential)</i>
Identify ecological principles that drive rangeland ecosystem function and structure.	2. Learning fundamental principles, generalizations, or theories. <i>(Important)</i>

Synthesize ecological principles and adapt them to rangeland management by developing skills in critical thinking, knowledge synthesis, literature search, verbal communication and scientific writing.	4. Developing specific skills, competencies and points of view needed by professionals in the field most closely related to this course. (<i>Important</i>)
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COURSE OUTCOMES -Upon completion of this course students will be able to:

1. Identify and describe major rangeland types and their unique importance to society.
2. Explain basic factors that drive rangeland ecosystems such as fire, herbivory and climate.
3. Describe how management actions can manipulate ecosystem drivers and influence ecosystem function and structure, and be able to predict the potential management outcomes.
4. Understand how management can affect ecosystem services provided by rangelands.
5. Generate science-based answers to complex rangeland management issues and effectively communicate those answers.

CLASS MATERIALS (optional): Students should purchase *Range Management Principles and Practices 6th Edition (2011)* by J. L. Holechek, R. D. Pieper, and C. H. Herbal. A number of readings will come out of this book and it is a valuable reference to have in your personal library; however a copy of this book will be placed on reserve at the Library. There will also be additional readings from scientific journals that will be available on USU Blackboard site for the course. Older and cheaper editions of this book are available online and will work just fine.

TEACHING APPROACH: Active student participation is paramount to student learning. Therefore, I will employ several pedagogy techniques to reach and engage students. Teaching methods will include lectures, assigned readings, class discussions, writing assignments, and group projects. This will provide opportunities for students to learn through a variety of methods. Students should prepare for class by completing assignments, being ready to listen, and actively participating in class discussions. Lecture format will be dependent upon student input and participation.

Participation in class discussions is expected and will cover a wide range of topics, some of which can be controversial. I expect all participants in class discussions to value others views and be respectful when expressing differences of opinion.

This syllabus is provided for students' convenience and may be changed at instructor's discretion; the class will be flexible to tailor the course to the current students and to incorporate current events.

EXAMS: Exams will reflect the material covered in lectures, assigned readings, class discussions and quizzes. Exams will consist of short essay, fill in the blank, calculation and short answer questions. Tests will demand that a student understand the material covered in class and readings well enough to synthesize the information and apply the principles gleaned and apply them to different rangeland management scenarios. It should be noted that some of the test questions will come directly from reading assignments (don't get behind on your readings). Makeup exams will only be offered if the student receives prior approval from me by providing a valid excuse or a Doctor's note. If there are questions regarding a score on an exam or if you have questions regarding the exam they must be brought to my attention within 1 weeks of receiving the scored exam after that time any concerns will not be addressed.

QUIZZES: Quizzes will be given at my discretion (Randomly). The quizzes will typically be fewer than 5 questions and could entail, short essay, multiple choice, true and false. There will be no make up for quizzes as they are intended to reward those who come to class prepared (**i.e. reading completed**). Quizzes may also be given at the end of a class period to help me to assess the effectiveness of my approach to ensure students understand the principles I am teaching.

HOMEWORK: Homework assignments will include papers and problems, these will be assigned at my discretion throughout the semester. Homework is due at the beginning of class on the appointed day; after that it is considered late and you will be docked 5% each day thereafter. There will be some papers written throughout the semester; specific instructions for each writing assignment will be given when it is assigned. In general, you should anticipate using **peer-reviewed literature** from scientific journals to support all of your arguments. Often the papers will focus on synthesizing scientific research and applying the information as solutions to range management issues.

CURRENT EVENTS: Each student is required to present 5 current events over the course of the semester (5 x 10 = 50 pts) by leading a 2 minute discussion on a current events in rangeland management / natural resource management. Each presentation is worth 10 points. Once a student has completed all of his/her required current events they can receive an **additional 10pts** each time they present for an **additional 50 pts of extra credit** earned (a maximum of 5 @ 10 pts = 50 extra credit pts). Current events can be found in newspapers, magazines, blogs, or scientific journals. Students will be provided with a digital subscription to High Country News for the semester (other sources may be added later, depending upon availability). You must present a current event that relates to rangeland management and how it may impact rangeland management. If you have any other question about articles or topics feel free to email me. In order to get full credit a student must select a current event, give a synopsis of the article, talk about how it relates to rangeland management and post a link to the article in the discussion section on canvas.

GRADING: Assessment of students will depend upon performance on exams, homework and participation. I will strive to provide objective and fair evaluation of each students work. However, students control their own fate; students who attend class regularly, actively participate in class

discussion and are diligent in completing assignments stand a much better chance at receiving a high grade from the course.

Category	Points	% of Grade
Mid-term Exams (3 @ 100pts)	300	38%
Final Exam	200	25%
Quizzes (10 @ 10pts)	100	13%
Home work (4 @ 25pts)	100	13%
Current Events (5 @ 10pts)	50	6%
Participation	50	6%
Total	800	100%

Grade distribution

- A (93 to 100% of total possible points)
- A- (90 to 92.9%)
- B+ (87 to 89.9%)
- B (83 to 86.9%)
- B- (80 to 82.9%)
- C+ (77 to 79.9%)
- C (73 to 76.9%)
- C- (70 to 72.9%)
- D (60 to 69.9%)
- F (<59.9%)

STUDENTS WITH DISABILITIES: The Americans with Disabilities Act states: "Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation within the program. If a student has a disability that will likely require some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability

Resource Center (797-2444), preferably during the first week of the course. Any request for special consideration relating to attendance, pedagogy, taking of examinations, etc., must be discussed with and approved by the instructor. In cooperation with the Disability Resource Center, course materials can be provided in alternative format, large print, audio, diskette, or Braille."

ACADEMIC INTEGRITY: Each student has the right and duty to pursue his or her academic experience free of dishonesty. The Honor System is designed to establish the higher level of conduct expected and required of all USU students. Infractions (cheating, falsification, and plagiarism) and their associated penalties are described in the USU Academic Policies and Procedures Manual (<http://catalog.usu.edu/content.php?catoid=7&navoid=1311>). Read "C" for cheating, "F" for falsification and "P" for plagiarism.

TENTATIVE COURSE OUTLINE AND ASSIGNMENTS

(Schedule is provided for students' convenience and may be changed at instructor's discretion.)

Reading assignments can be viewed in Canvas under "Syllabus" or "Assignments")

Date	Topic	Readings & Assignments Due
	Overview of Rangelands	
Jan. 11	Syllabus review; Rangelands: what are they?	
Jan. 13	The history of range management	Chap. 2
Jan. 19	The role of science in range management.	Provenza
Jan. 21	Class Discussion: (View point) Rangelands uses (Biases)	Fuhlendorf; paper #1
Jan. 26	Global Rangelands: Tundra to deserts	Chap. 4; Utah Rangelands
Jan. 28	Library lecture Connie Woxland	Library 122
Feb. 2	Exam 1: Rangeland Overview	

	Range Ecology	
Feb. 4	Guest Lecture	TBD
Feb. 9	Plant Physiology	
Feb. 11	Range Ecology: Models	Dyksterhuis, Brikse
Feb. 16	Herbivory	
Feb. 18	No Class (Monday Schedule)	Fuhlendorf
Feb. 23	Fire	Bond
Feb. 24	Sagebrush Conference: Livestock grazing, fire and weeds	
Mar. 1	Climate/Invasive spp	Brown, Sheley;
Mar. 3	Exam 2: Range Ecology	
Mar. 8	Class Discussion:	
	Range Management	
Mar. 10	Spring Break	
Mar. 15	Grazing Behaviour	Provenza
Mar. 17	Cardinal principles of grazing management	Chap. 8, 11
Mar. 22	Grazing systems	Briske, Problem #1 due
Mar. 29	Class discussion:	Paper #2
Mar. 31	Range Improvements (Chemical and Mechanical)	Chap. 15, Davies
Apr. 5	Range improvements (Prescribed fire, grazing)	Launchbaugh, Fuhlendorf
Apr. 7	Guest Lecture: Dr. Dave Dahlgren	
Apr. 12	Troy Forest: Water Developments	
	Rangelands Monitoring	
Apr. 14	Exam 3: range management	

Apr. 19	Rangeland Monitoring	
Apr. 21	Rangeland Monitoring Continued.	
Apr. 26	TBD	
Apr. 21	The Cherokee Strip: A case study for multiple use rangelands.	
Apr. 28	The future of rangelands	Brunson, Holechek
May 5	Final Exams (HYPER 116)	9:30-11:20 am

READING LIST

Overview of Rangelands

Provenza, F. D. 1991. Viewpoint: Range Science and range management are complementary but distinct endeavors. *Journal of Range Management* 44:181-183.

Range Ecology

Dyksterhuis, E. J. "Condition and management of range land based on quantitative ecology." *Journal of range management* 2.3 (1949): 104-115.

D. D. Briske, S. D. Fuhlendorf, and F. E. Smeins (2005) State-and-Transition Models, Thresholds, and Rangeland Health: A Synthesis of Ecological Concepts and Perspectives. *Rangeland Ecology & Management*: January 2005, Vol. 58, No. 1, pp. 1-10.

Fuhlendorf, S. D., and Engle, D. M. 2001. Restoring Heterogeneity on Rangelands: Ecosystem Management Based on Evolutionary Grazing Patterns. *BioScience* 51:625-632.

Bond, W. J., Woodward, F. I., Midgley, G. F. 2005. The global distribution of ecosystems in a world without fire. *New Phytologist* 165:525-538.

Sheley, R. L., and Krueger-Mangold, J. 2003. Principles for restoring invasive plant-infested rangeland. *Weed Science* 51:260-265.

Brown, J. R., Blank, R. R., McPherson, G. R., Kenneth, K. T. 2005. *Rangelands and Global Change*. Society for Range Management, Lakewood, CO.

Range Management

Provenza, F. D., and D. F. Balph. 1987. Diet learning by domestic ruminants: theory, evidence and practical implications. *Applied Animal Behavior Science* 18:211-232.

Briske, D. D., Derner, J. D., Brown, J. R., Fuhlendorf, S. D., Teague, W. R K. M. Havstad, R. L. Gillen, Andrew J. Ash, W. D. Willms 2008. Rotational grazing on rangelands: reconciliation of perception and experimental evidence. *Rangeland Ecology & Management* 61: 3-17.

Davies, K. W., Boyd, C. S., Beck, J. L., Bates, J. D., Svejcar, T. J., Gregg, M. A. 2011. Saving the sagebrush sea: an ecosystem conservation plan for big sagebrush plant communities. *Biological Conservation* 144:2573-2584.

Launchbaugh, Karen, and J. W. Walker. "Targeted grazing—a new paradigm for livestock management." *Targeted grazing: a natural approach to vegetation management and landscape enhancement*. Centennial, CO, USA: American Sheep Industry Association (2006): 2-8.

Fuhlendorf, Samuel D., et al. "Pyric herbivory: rewilding landscapes through the recoupling of fire and grazing." *Conservation Biology* 23.3 (2009): 588-598.

Rangelands of the Future

Brunson, M. W., and Huntsinger, L. 2008. Ranching as a conservation strategy: can old ranchers save the new west? *Rangeland Ecology & Management* 61: 137-147.

Holechek, J. L. (2009). Range Livestock Production, Food, and the Future: A Perspective. *Rangelands* 31:20-25.

High Country News (subscription)

- 1) Go to: www.hcn.org/subscribe
- 2) Scroll down to the "Student — DIGITAL Subscription" and click Continue.
- 3) Step two will bring you to the price page where email and password will be requested. NOTE: A one-year term and \$25 price will show, but with the discount code, the price will change to zero and the term to one semester.
- 4) In the special promotion code box, enter: **HCNStudent**. The price will change to zero after they hit the "Apply" button.
- 5) Continue entering mailing address and other fields, and click Continue.
- 6) Done!

If they want the \$10/semester print sub, they use the same code but scroll to "Student —FULL Subscription" in step 2.

Please note ... your students can have both, ie, I can send hard copies to the classroom (or wherever you wish) AND get the free digital subscription.