

Geog 175: Topics in the History of Natural Resource Management

Spring 2006: Rangelands

Nathan Sayre

Wednesdays, 1-4 p.m., 575 McCone Hall

This course examines the scientific, political-economic and ecological dimensions of natural resource management in a historical perspective. Each year a particular natural resource or category of resources will be selected for reading, research and discussion. Readings will introduce students to the current ecological knowledge of the resource, management practices associated with it, and problems or issues that managers (or society in general) faces with respect to it. Then students will work as a team of researchers to endeavor to understand how the present situation evolved over time. What have scientists known, when? How did they come to ask the questions that they did? How did their knowledge interact with the practices of people using and managing the resource in question? How were knowledge production and resource exploitation organized, and at what scales? How are current problems related to these histories?

Our overarching goal is to understand the relationship of knowledge, society and the environment. In particular, we are interested in how scientific knowledge and capitalist social relations mediate the interaction of humans and natural resources.

The resource for this semester is rangelands. A broad, somewhat catch-all category of landform, rangelands encompass roughly half the world's terrestrial area. They include virtually any type of land not suited to crop agriculture: grasslands, prairies, deserts, tundra and taiga, mountains and many types of forest. Rangelands might well be described as the evolutionary birthplace of humans, in interaction with fire, large herbivores and other predators. Yet the discipline of range science is only about 100 years old.

It is generally accepted that range science developed first in the Western United States, and that “development” projects and programs aimed at rangelands and pastoralists overseas since World War II have been deeply flawed. The connections between these two points have not been systematically explored, however. Our research agenda will focus on identifying and understanding these links: Are the flaws in “pastoralist development” products of scientific errors in early range science, or in the development apparatus itself? How are more recent innovations in rangeland ecology—innovations that have come mostly from overseas, and often in reaction to the human and environmental impacts of “development” itself—being brought back to the Western US?

How to reach me

My office hours are Wednesdays, 9:30-11:30 or by appointment. My email is nsayre@berkeley.edu, phone is 643 4084.

Course goals

This is a *research* seminar: We are interested not only in covering the material listed in the syllabus but also in formulating and executing a plan for original research. There will be significant assigned reading during the early weeks of the semester, but as time progresses the work for the course will consist more and more of directed independent research. Our goals include the following:

- To understand the history of rangeland management as a scientific, political, cultural and practical realm of human knowledge and action.
- To learn research skills: how to define, pursue, adapt and refine research questions; how to find and use archives and library holdings; how to review materials efficiently, identifying those that are useful and leaving others behind; taking thorough notes; assembling bibliographic information accurately and comprehensively; identifying and finding further resources in a seemingly endless cycle of inquiry.
- To assess, analyze and synthesize research findings into cogent and original arguments. This requires diligent reading, writing, re-reading and re-writing.
- To work together as a team to answer our questions comprehensively and efficiently. We will have to divide up the tasks to be completed, avoiding any redundancy of effort. Yet each student will also have to keep his/her eyes open for potentially important material for the others' tasks and communicate these tips to them.

Requirements

Attendance and participation (1/3rd of final grade): Students are expected to come to seminar every week prepared to participate actively in discussion.

Research notes and bibliography (1/3rd): Each student must keep research notes, preferably in a notebook (note cards are also acceptable). You may take your notes on computer, but *always make hard copies as you go*. A complete citation for every book, article, document and archive consulted must be included, along with notes and annotations for those materials deemed relevant to the project.

Summary write-up and presentation (1/3rd): Each student (possibly working in a small team) is expected to write up his/her research findings and present them to the seminar in the final weeks of the semester. The write-up may take the form of an annotated bibliography, a review of the literature, a section of a larger argument, or a more conventional seminar paper—we will determine the details as the course progresses.

Course Schedule:

25 January: Pitfalls of Overseas Pastoral Development

Jim Ferguson: *The Anti-Politics Machine*

1 February: US Rangelands Today

Nathan Sayre: *Working Wilderness*

8 February: The State of Our Knowledge

Nathan Sayre: *The New Ranch Handbook*

15 February: Early Scientific Assessments

H.L. Bentley. 1898. Cattle Ranges of the Southwest: A History of the Exhaustion of the Pasturage and Suggestions for its Restoration. US Department of Agriculture Farmer's Bulletin No. 72.

Jared G. Smith. 1899. Grazing Problems in the Southwest and How to Meet Them. US Department of Agriculture Division of Agrostology Bulletin No. 16.

Nathan Sayre. 2002. "The Formation of Ranching." Pp. 55-81 in *Ranching, Endangered Species, and Urbanization in the Southwest: Species of Capital*.

*David Griffiths. 1902. Forage Conditions on the Northern Border of the Great Basin. US Department of Agriculture Bureau of Plant Industry Bulletin No. 15.

*David Griffiths. 1904. Range Investigations in Arizona. Department of Agriculture Bureau of Plant Industry Bulletin No. 67.

*E.O. Wooton. 1908. The Range Problem in New Mexico. New Mexico College of Agriculture and Mechanic Arts, Agricultural Experiment Station Bulletin No. 66.

22 February: Political-Economic Context

Samuel P. Hays. *Conservation and the Gospel of Efficiency*, chapters 4 and 5.

Wallace Stegner. "Disaster on the Great Plains." Pp. 294-304 in *Beyond the Hundredth Meridian: John Wesley Powell and the Second Opening of the West*

William Abruzzi. 1995. The Social and Ecological Consequences of Early Cattle Ranching in the Little Colorado River Basin. *Human Ecology* 23: 75-98.

*Karen Merrill. *Public lands and political meaning: ranchers, the government, and the property between them*.

*Maurice Frink et al.: *When Grass Was King*, part 1 (pp. 5-123)

*Lewis Atherton: *The Cattle Kings*, chapters 9 and 10.

*Gene M. Gressley. 1959. Teschemacher and deBillier Cattle Company: A Study of Eastern Capital on the Frontier. *Business History Review* 33: 121-137.

1 March: The Paradigm Coalesces

Frederic E. Clements. 1916. *Plant Succession: An analysis of the development of vegetation*. Pp. 3-7, 105-110.

Frederic E. Clements. 1920. *Plant Indicators: The relation of plant communities to process and practice*. Pp. 18-34, 270-335.

Arthur W. Sampson. 1919. Plant Succession in Relation to Range Management. US Department of Agriculture Bulletin No. 791.

- James T. Jardine. 1917. Increased Cattle Production on Southwestern Ranges. US Department of Agriculture Bulletin No. 588.
- *Arthur W. Sampson. 1913. The Reseeding of Depleted Grazing Lands to Cultivated Forage Plants. US Department of Agriculture Bulletin No. 4.
- *Arthur W. Sampson. 1914. Natural Revegetation of Range Lands Based upon Growth Requirements and Life History of the Vegetation. *Journal of Agricultural Research* 3: 93-147.
- *Arthur W. Sampson. 1926. Grazing Periods and Forage Production on the National Forests. US Department of Agriculture Bulletin No. 1405.
- *Christian C. Young. 1998. Defining the Range: The Development of Carrying Capacity in Management Practice. *Journal of the History of Biology* 31: 61-83.

8 March—no class due to AAG meetings

15 March: Institutionalizing Range Science

- E.J. Dyksterhuis. 1949. Condition and Management of Range Land Based on Quantitative Ecology. *Journal of Range Management* 2: 104-115.
- James A. Young. 2000. Range research in the far western United States: the first generation. *Journal of Range Management* 53: 2-11.
- James A. Young and Charlie D. Clements. 2001. Range research: the second generation. *Journal of Range Management* 54: 115-121.
- *W.R. Chapline. 1944. The History of Western Range Research. *Agricultural History* 18: 127-143.
- *C.H. Wasser. 1977. Early development of technical range management ca. 1895-1945. *Agricultural History* 51: 63-67.
- *Textbooks by Sampson; Stoddart and Smith.

22 March: Early Critiques

- H.A. Gleason. 1939. The Individualistic concept of the plant association. *American Midland Naturalist* 21: 92-110.
- Lincoln Ellison. 1949. The ecological basis for judging condition and trend on mountain range land. *Journal of Forestry* 47: 787-795
- *Lincoln Ellison. 1960. Influence of Grazing on Plant Succession of Rangelands. *Botanical Review* 26: 1-78.

29 March—no class due to spring break

5 April: The Critique from Overseas

- Roy Behnke, Ian Scoones and Carol Kervin eds.: *Range Ecology at Disequilibrium*, pp. 1-41, 77-103.
- M. Stafford Smith. 1996. Management of Rangelands: Paradigms at Their Limits. Pp. 325-357 in J. Hodgson and A.W. Illius, eds. *The Ecology and Management of Grazing Systems*.
- *B.H. Walker, D.A. Matthews and P.J. Dye. 1986. Management of grazing systems--existing versus an event-orientated approach. *South African Journal of Science* 82: 172.

- *Milchunas, D. G. and W. K. Lauenroth. 1993. Quantitative effects of grazing on vegetation and soils over a global range of environments. *Ecological Monographs* 63: 327-366.
- *Peter A. Vesk and Mark Westoby. 2001. Predicting plant species' responses to grazing. *Journal of Applied Ecology* 38: 897-909.
- *Matthew D. Turner. 1998. The Interaction of grazing history with rainfall and its influence on annual rangeland dynamics in the Sahel. Pp. 237-261 in K.S. Zimmerer and K.R. Young, eds. *Nature's Geography: new lessons for conservation in developing countries*. University of Wisconsin Press.

12 April: "Holistic" Range Management

Allan Savory. 1988. *Holistic resource management*.

- *Papers on "Grazing Systems and Effects of Grazing," in *Journal of Range Management* 39(6) (November 1986), pp. 482-520.

19 April: Lessons from the Serengeti

- S.J. McNaughton. 1979. Grazing as an optimization process: Grass-ungulate relationships in the Serengeti. *American Naturalist* 113: 691-702.
- S.J. McNaughton. 1983. Compensatory plant growth as a response to herbivory. *Oikos* 40: 329-336.
- S.J. McNaughton, F.F. Banyikwa, and M.M. McNaughton. 1998. Root biomass and productivity in a grazing ecosystem: the Serengeti. *Ecology* 79: 587-592.
- S.J. McNaughton, D.G. Milchunas, and D.A. Frank. 1996. How can Net Primary Productivity be measured in grazing ecosystems? *Ecology* 77: 974-977.
- M. Oesterheld, O.E. Sala, and S.J. McNaughton. 1992. Effect of animal husbandry on herbivore-carrying capacity at a regional scale. *Nature* 365: 234-236.
- *S.J. McNaughton. 1984. Grazing Lawns: Animals in herds, plant form, and coevolution. *American Naturalist* 124: 863-886.
- *S.J. McNaughton. 1983. Serengeti grassland ecology: the role of composite environmental factors and contingency in community organization. *Ecological Monographs* 53: 291-320.
- *S.J. McNaughton. 1985. Ecology of a grazing ecosystem: the Serengeti. *Ecological Monographs* 55: 259-294.
- *S.J. McNaughton. 1993. Biodiversity and Function of Grazing Ecosystems. Pp. 361-383 in Ernst-Detlef Schulze and Harold A. Mooney, eds. *Biodiversity and Ecosystem Function*.

26 April: An Alternative Paradigm?

- Mark Westoby. 1979/80. Elements of a theory of vegetation dynamics in arid rangelands. *Israel Journal of Botany* 28: 169-194.
- Mark Westoby, Brian Walker and Immanuel Noy-Meir. 1989. Opportunistic management for rangelands not at equilibrium. *Journal of Range Management* 42: 266-274.
- A.W. Illius and T.G. O'Connor. 1999. On the relevance of nonequilibrium concepts to arid and semiarid grazing systems. *Ecological Applications* 9: 798-813.

- *G.F. Griffin and M.H. Friedel. 1985. Discontinuous change in central Australia: some implications of major ecological events for land management. *Journal of Arid Environments* 9: 63-80.
- *M.H. Friedel. 1991. Range condition assessment and the concept of thresholds: a viewpoint. *Journal of Range Management* 44: 422-426.
- *Brandon T. Bestelmeyer et al. 2004. Land management in the American Southwest: A State-and-Transition approach to ecosystem complexity.

3 May: Rangeland Health and Landscape Ecology

National Research Council: *Rangeland Health: New Methods to Classify, Inventory, and Monitor Rangelands*, pp. 1-63.

J. Ludwig, D. Tongway, D. Freudenberger, J. Noble and K. Hodgkinson, eds.: *Landscape ecology, function and management : principles from Australia's rangelands*, pp. 1-47.

Books on Reserve at the Biosciences Library, Valley Life Sciences Building

Rangeland health : new methods to classify, inventory, and monitor rangelands / Committee on Rangeland Classification, Board on Agriculture, National Research Council. Washington, D.C. : National Academy Press, 1994.

Range ecology at disequilibrium : new models of natural variability and pastoral adaptation in African savannas / edited by Roy H. Behnke Jr., Ian Scoones, and Carol Kerven. London : Overseas Development Institute, 1993.

The new ranch handbook : a guide to restoring western rangelands / by Nathan F. Sayre. Santa Fe, N.M. : Quivira Coalition, 2001.

Ecological implications of livestock herbivory in the West / editors, Martin Vavra, William A. Laycock, Rex D. Pieper. 2nd ed. Denver, CO : Society for Range Management, 1999.

Plant succession; an analysis of the development of vegetation, by Frederic E. Clements. Washington, Carnegie Institution of Washington, 1916.

Dynamics of vegetation; selections from the writings of Frederic E. Clements. Comp. and ed. by B.W. Allred and Edith S. Clements. New York, H. W. Wilson, 1949.

Plant indicators: the relation of plant communities to process and practice, by Frederic E. Clements. Washington, Carnegie Institution of Washington, 1920.

Saving the prairies : the life cycle of the founding school of American plant ecology, 1895-1955 / Ronald C. Tobey. Berkeley : University of California Press, 1981

Range management, principles and practices. [Sampson, Arthur W. \(Arthur William\),](#)

1884-1967. New York, Wiley, 1952

Range and pasture management, by Arthur W. Sampson ... New York, John Wiley & Sons, inc.; [etc., etc.] 1923.

Plant succession in relation to range management / by Arthur W. Sampson. Washington, D.C. : U.S. Dept. of Agriculture, 1919

The Western range. Letter from the Secretary of Agriculture transmitting in response to Senate resolution no. 289 : a report on the Western Range - a great but neglected natural resource. Washington : U.S. Govt. Print. Off., 1936.

Management of pastoral development in the third world / Stephen Sandford. Chichester [West Sussex] ; New York : Wiley, 1982

Contemporary nomadic and pastoral peoples : Asia and the North / [Philip Carl Salzman, guest editor]. [Williamsburg, Va. : Dept. of Anthropology, College of William and Mary, 1982

Contemporary nomadic and pastoral peoples, Africa and Latin America / [Philip Carl Salzman, guest editor] [Williamsburg, Va.] : [Dept. of Anthropology, College of William and Mary], 1982

Pastoralists : equality, hierarchy, and the state / Philip Carl Salzman. Boulder, Colo. : Westview Press, a member of the Perseus Books Group, 2004.

Grass productivity. Translated from the French by Catherine T. M. Herriot. Conversion of tables by M. M. Sandilands. New York, Philosophical Library, 1959.

Holistic resource management / Allan Savory. Washington, D.C. : Island Press, 1988.

Range management, by Laurence A. Stoddart ... and Arthur D. Smith. 1st ed.

Range management [by] Laurence A. Stoddart [and] Arthur D. Smith. 2d ed.

A history of the Society for Range Management, 1948-1985 / Clinton H. Wasser, Elbert H. Reid, Arthur D. Smith. Denver, Colo. : Society for Range Management, 1987.

Landscape ecology, function and management : principles from Australia's rangelands / editors, J. Ludwig ... [et al.]. Collingwood, Vic. : CSIRO Australia, 1997.