

NR 378: Forests, Fire, Restoration, and Biomass Energy in New Mexico
Preliminary Syllabus

Dates: August 8-12 (arrive on 7th, leave on 13th)

Collaborating Organizations: Forest Guild (Santa Fe, NM) and Cottonwood Gulch Foundation (Thoreau, NM).

Course Background:

The Zuni Mountains in the Cibola National Forest are an ecologically diverse and culturally rich landscape containing large wooded areas in which the harvesting of traditional forest products is frequently not economically feasible. Nevertheless thinning and other treatments are frequently proposed to maintain forest health and restore fire regimes, yet remain controversial in some cases particularly where management is proposed inside roadless areas. Harvesting forests for biomass energy provides one potential means for making fuel treatments economically feasible while also generating needed revenue for the region. The challenge is to harvest biomass in a way this is economically viable, ecologically sustainable, and culturally sensitive. In addition, the extent to which fuels treatments reduce fire and insects risks is subject to debate, thus requiring the application of the best available science.

This will be a summer field course in which students learn about how economically marginal forests are managed. The location will be the Mt. Taylor district of the Cibola National Forest. The course will focus particularly on using forest harvesting for biomass energy as a strategy for proactively managing to reduce risk of catastrophic wildfire. Building upon a long-term forest biomass project currently being conducted by the Forest Guild (a large non-profit sustainable forestry organization based in New Mexico) in this ranger district, students will: meet with key stakeholders in fire management and forest biomass energy production (e.g. US Forest Service personnel, logging and trucking contractors, biomass energy producers, and stakeholder groups representing other uses for forest land, etc.); visit sites where biomass harvesting is currently occurring; learn about the ecological and socio-economic context of the study area; visit lands representing ecologically/recreationally/culturally significant values; learn about the economic constraints of biomass harvesting; and learn about its ecological impacts and benefits.

Course Requirements:

- Attendance and participation on field trip in New Mexico and participation in all activities
- Attendance at advance meeting before trip
- Read at least four of the background readings prior to field trip
- Write up and submit group project prior to leaving
- Blackboard reflections on return

Group Project

Due July 29, 2011

Students should break up into 3 groups of 3. Each group should address one of the following topics:

- Analysis of stakeholder processes practiced in this and other CFRPs and how these compare with what is discussed in literature
- Analysis of economics and management of biomass energy harvest in this and other CFRPs. How does this compare with what literature considers “optimal?”
- Analysis of fuels reduction strategies in this and other CFRPs. How do these compare with what is in literature?
- Discussion of site suitability criteria for restoration projects in this and other CFRPs, how they are chosen, and how they relate to literature

Deliverable: Group authored 5-8 page paper with literature review, plan/project review and critical analysis.

Reading assignments

Due July 11, 2011

Choose six items (at least two from the one star list and at least two from the two star list) from the reading list that you don't cover in your paper and write up a paragraph on each describing the major findings and the relevance to this class and the project.

Reading List

(all readings will be on Blackboard)

- *Agee, J.K. 1998. The landscape ecology of western fire regimes. *Northwest Science* 72:24-32.
- *Albert, S., N. Luna, R. Jensen, and L. Livingston. 2004. Restoring biodiversity to pinon-juniper woodlands. *Ecological Restoration* 22:18-25.
- *Allen, C.D., M. Savage, D.A. Falk, K.F. Suckling, T.W. Swetnam et al. 2002. Ecological restoration of southwestern ponderosa pine ecosystems: a broad perspective. *Ecological Applications* 12: 1418-1433.
- *Bentz, B.J. et al. 2010. Climate change and bark beetles of the Western United States and Canada: direct and indirect effects. *Bioscience* 60:602-613.
- *Brown, R.T., J.K. Agee., and J.Frankin. 2004. Forest restoration and fire: principles in the context of place. *Conservation Biology* 18:903-912.
- *Covington, W.W. and M.M. Moore. 1994. Southwestern ponderosa forest structure: changes since Euro-American settlement. *Journal of Forestry* 92(1):39-47.
- *Dick-Peddie, W. A., W. H. Moir, and R. Spellenberg 1993. *New Mexico vegetation : past, present, and future.* University of New Mexico Press, Albuquerque.

- *Evans, Everett, Stephens and Youtz, 2011, Comprehensive Fuels Treatment Practices Guide for Mixed Conifer Forests. Forest Guild, Santa Fe, NM
- **Evans, A.M. and A. J. Finkral. 2009. From renewable energy to fire risk reduction: a synthesis of biomass harvesting and utilization case studies in US forests. *Global Change Biology– Bioenergy* 1(3): 211-219.
- Forest Guild. 2010. Zuni Mountain Landscape Strategy
- **Hjerpe, E.E. and Y.S. Kim. 2008. Economic impacts of southwestern National Forestry fuels reductions. *Journal of Forestry* 106(6):311-316.
- **Lattimore, B. et al. 2009. Environmental factors in woodfuel production: Opportunities, risks, and criteria and indicators for sustainable practices. *Biomass and Bioenergy* 33:1321-1342.
- *Lynch, D. L., W. H. Romme, and M. L. Floyd. 2000. Forest restoration in Southwestern Ponderosa Pine. *Journal of Forestry* 98:17-24.
- *Millar, C., N. Stephenson, and S. Stephens. 2007. Climate change and forests of the future: managing in the face of uncertainty. *Ecological Applications* 17:2145-2151.
- **Noss, R.F. et al. 2006. Managing fire-prone forests in the western United States. *Frontiers in Ecology* 4(9): 481-487.
- **Richard, T. and E. Stein (2003). Kicking Dirt Together in Colorado: Community Ecosystem Stewardship and the Ponderosa Pine Forest Partnership. Forest communities, community forests. J. Kusel and E. Adler. Lanham, Md., Rowman & Littlefield Publishers: xxi, 301 p. Ch 9.
- **Schumann (2004). Fuel Reduction Projects in Southwest Ponderosa Pine Forests, National Community Forestry Center, Southwest Region Working Paper. 9.
- **Zhang, Q., K. Goldstein, et al. (2009). A review of life cycle assessment studies on renewable energy derived from forest resources. Renewable energy from forest resources in the United States. B. D. Solomon and V. A. Luzadis. London ; New York, Routledge: xx, 330 p. Ch. 8

Travel

Please arrive no later than the 7th by mid afternoon at the Albuquerque Int'l Airport. Or if driving, be at Cottonwood Gulch by evening of the 7th. Please book your own air travel.

Preliminary Packing List

Sleeping Bag (light is OK)
 Rain Gear (pants, if possible)
 Fleece/jacket/sweater
 Hiking boots plus comfortable shoes
 Water bottles
 Sun screen

Health and Safety Guidelines

Please consult

http://www.uvm.edu/~riskmgmt/?Page=guidelines/studyabroad.html&SM=guidelines/riskreduxguidelines_submenu.html