

UNIVERSITY OF VERMONT -- RUBENSTEIN SCHOOL OF
ENVIRONMENT AND NATURAL RESOURCES

**NR 205 -- Ecosystem Management: Integrating Science,
Society and Policy**

Course Syllabus, Fall 2010

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Office Hours: TTH 10:00-11:00, or as arranged by email

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Meeting Time and Place: Living Learning CM 216
TTH 8:30 am - 9:45 pm

Required Materials:

There is no textbook for this course. Course readings will be made available on **Blackboard**. Please check Blackboard for weekly reading assignments. Additional materials will be distributed in class.

Course Description and Objectives:

This course builds upon the knowledge of natural and social sciences gained in the previous four core courses and challenges you to begin integrating information, concepts and tools to address natural resource and environmental issues from an ecosystem perspective. Through lectures, readings, class discussions, case studies, and problem solving exercises, you will learn more about ecosystem science and management policies and approaches, and then apply your

knowledge to identify management principles that are consistent with a more holistic ecosystem approach.

We begin by reviewing ecosystem science and exploring how to recognize degraded and healthy ecosystems. We will discuss the notion of managing for ecosystem integrity and how system integrity can be defined and measured. Approaches that consider people as integral parts of the ecosystem and the role of ecosystems in providing goods and services for people will be explicitly addressed. We will review classic approaches to natural resource management and consider the ways in which environmental policies can facilitate or discourage integration. Finally, we will explore how an adaptive management plan that is consistent with an integrated, ecosystem perspective might be developed and applied. In this unit we will examine in detail an assessment, planning, and implementation framework for ecosystem management.

A core element of this course is the application of ecosystem management theory to a case study that the class explores throughout the semester. This term we will work on the Lake Victoria Basin of East Africa, developing a transboundary ecosystem management convention for the region. You will have group exercises and homework assignments that collectively build towards a final convention document developed by the entire class. The course culminates in a two day conference modeled after contemporary convention processes, such as the on-going COP (or Convention of the Parties) meetings seeking a new United Nations Framework Convention on Climate Change.

Upon successful completion of this course, you should be able to:

1. Describe the concept of "ecosystem" and the advantages and constraints of using ecosystems as a management unit.
2. Identify characteristics that might indicate a healthy ecosystem.
3. Recognize traits that might indicate a degraded ecosystem or an ecosystem potentially at risk.
4. Describe some traditional environmental management approaches and their strengths and weaknesses.
5. Develop management goals and objectives that consider sustainability as the core objective of ecosystem management.
6. Recognize the constraints and opportunities for ecosystem management within current U.S. environmental management policy.
7. Apply natural science and social science knowledge and analytical tools in an adaptive management framework to address environmental issues.

Attendance

I encourage all students to discuss course content on an individual basis with me during office hours. Class attendance and participation are essential for mastering the material. It is not

realistic to expect to do well in this class without attending and participating in the classroom activities.

We will be taking attendance this term. You are allowed two unexcused absences. You are allowed additional absences with prior (48 hour) approval. Each unexcused absence after the first two will result in a one percentage point decrease in your final grade. Your participation score will also be adjusted accordingly.

Course Requirements

There will be one mid-term exam, a comprehensive final examination, and three homework/writing assignments at regular intervals over the course of the semester. In addition, there will be regular but brief in-classes quizzes on the reading assignments.

Grading will be as follows:

Mid-term Exam	27.5 %
Final Exam	27.5 %
Homework Assignments	30 %
In-class pop reading quizzes	5%
Attendance, in-class activities, and participation	10 %

There will be no make-up exams except by advance arrangement. A score of zero points will be given for exams missed without prior notification. You must arrive at the exam at the scheduled time. You are allowed a 15 minute grace period. Late arrivals after the grace period will not be able to take the exam.

Additional information about each homework assignment will be provided in class. Assignments submitted after the due date will be penalized 0.5 letter grade per day except in extremely unusual circumstances (advanced arrangement required).

Academic Integrity:

Students are expected to adhere to UVM's code on academic honesty. Although students are encouraged to discuss material and ideas freely among yourselves, all work submitted for grading must be strictly your own.

Course Outline and Schedule:

Topics	Dates Covered
I. Introduction to Ecosystem Management <ul style="list-style-type: none">- What is ecosystem management?- Grumbine's 10 themes of ecosystem management- Ecosystem management in the US<ul style="list-style-type: none">• Case study: The Northwest Forest Plan• Evolution of ecosystem management in Federal agencies• Case study: Development of ecosystem management in the U.S. Forest Service	Aug. 30 – Sept. 21
II. Introduction to the Lake Victoria Basin and International Conventions <ul style="list-style-type: none">- Multi-lateral environmental conventions- The Lake Victoria Basin- Introduction to class project- The Carpathian Convention case study	Sept. 23 – Oct. 5
III. The Ecosystem Management Approach	
A. Determining the stakeholders and defining the ecosystem area <p>Stakeholder identification</p> <p>Public Involvement Mechanisms</p> <ul style="list-style-type: none">- National Environmental Policy Act case study- Environmental Impact Statement (EIS) process <p>Defining the management unit</p> <ul style="list-style-type: none">- ecological boundaries- ecoregions, watersheds, and human communities- issues of scale - do political and natural boundaries coincide?	Oct. 7 – Oct. 15
B. Characterizing ecosystem structure and function <p>The ecosystem as a basis for management</p> <ul style="list-style-type: none">- ecosystem structure, function, and composition- issues of context and scale in ecology- hierarchy of biological organization- ecosystem resilience and resistance <p>Degraded and healthy ecosystems</p> <ul style="list-style-type: none">- characteristics of degraded ecosystems- factors that influence the magnitude of human stresses - type, intensity, duration, frequency, timing, and scale of impacts- natural variation, ecosystems as dynamic entities- characteristics of good ecological indicators	Oct. 18 – Oct. 28

- selecting indicators for use in management
- pressure-state-response framework

Mid-term Examination

Nov. 2

C. Identifying and incorporating key socio-economic issues

Nov. 4 - 16

- determining natural resource values: valuation of market and non-market ecosystem values
- balancing human needs and desires with ecosystem capacities
- implementation approaches that incorporate human uses
 - Biosphere Reserves
 - Integrated Conservation and Development Projects
 - The “Functional Landscapes” approach
- formulating goals around the concept of sustainability
- writing measurable objectives

D. Adaptive management over time and space

Nov. 18

- management as experimentation
- iterative approach: monitor, reassess and reformulate
- monitoring: baseline, effectiveness, implementation, and validation
- adaptive management case studies

Thanksgiving Recess

Nov. 22-26

IV. Convention on Ecosystem Management in the Lake Victoria Basin

Group preparatory work for convention

Nov. 30

Convention

Dec. 2 – 7

Course wrap-up

Dec. 9

Final Exam

MON 12/13/2010 10:30 - 01:15 PM L/L CM 216