



THE OHIO STATE UNIVERSITY

Principles and Tools of Ecosystem Restoration

ENR 3800



the future is in your hands

Fall Semester 2017



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Course Overview

This course will provide an overview of key concepts in the restoration planning process and examine how key restoration tools are used by practitioners. The course is structured around the concept of “Adaptive Management” - an iterative approach to ecological management designed to deal with uncertainty and the need to understand long-term ecosystem responses to interventions. The course is split into “principles” and “tools” section. Each week the course will explore a key theoretical concept and a related tool.

Prerequisites: ENR2100; or Biology 1114 (or equivalent); or permission of instructor

Course aims

The aims of the course are to:

- Explore the concept of “Adaptive Management” as it pertains to ecosystem restoration including the development of project objectives, choice of interventions, monitoring to detect change and reevaluation of future management
- Evaluate the philosophical and ecological concepts which underpin decision-making in ecosystem restoration
- Describe the practical application of key tools and interventions, and their ecological outcomes, in case-study ecosystems
- Describe the logistical, practical, financial and ecological constraints on restoration projects

Teaching methods

The course will be primarily lecture-based but we will integrate a variety of interactive activities into each session including mini-discussions, Q&As and field visits. Students wanting to gain practical experience in restoration should take the associated course “Restoration in Practice” (ENR 4800) for which this course is a prerequisite.

Intended Learning Outcomes

By the end of this course students will be able to:

1. Describe the planning tools that ecologists use to tackle restoration problems
2. Identify the ecological principles that guide decision making during restoration
3. Choose appropriate restoration interventions for specific ecological problems
4. Make informed trade-offs between the economic and ecological costs and benefits of different restoration interventions

Course Schedule

Course dates

- The course will run from **22nd August 2017 to 6th December 2018**
- Classes are scheduled on **Tuesdays and Thursdays** between **12:40 pm and 1:35 pm**
- The week-to-week curriculum is shown below, this may be subject to change.

Course location

- Classes will be held in **Kottman Hall 333**

Course curriculum

Wk	Section	Lecture 1	Lecture 2	Related action
1	Introduction	Introduction	Myths of Restoration	<i>Dealing with preconceptions</i>
2	Preparing and	Naturalness	Reference States	<i>Deciding on targets</i>



3	planning for restoration	The Land Ethic	Nature writing	<i>Justifying restoration</i>
4		Adaptive Management	Logic Model	<i>Participatory planning</i>
5	Restoring ecosystem structure and function	Invasive species	Herbicide	<i>Controlling invasive species</i>
6		Site hydrology	Dam	<i>Restoring wetland hydrology</i>
7		Forest structure	Chainsaw	<i>Modifying canopy composition and structure</i>
8		Community composition	Seed	<i>Reseeding native plants</i>
9		Functional groups	Spade	<i>Planting trees and woody vegetation</i>
10	Restoring Soil Health	Soil remediation	Plough	<i>Mineland reclamation</i>
11		Soil quality	Compost	<i>Managing productivity</i>
12		Soil erosion	Silt fence	<i>Erosion control structures</i>
13	Using disturbance	Fire regimes	Drip torch	<i>Prescribed burning</i>
14		Biotic interactions	Goat	<i>Conservation grazing</i>
15	Monitoring	Monitoring design	Quadrat	<i>Assessing long-term ecosystem dynamics</i>
16	Film festival	Sharing Video Essays		

***Please note** - weeks denoted in pink will be delivered by Prof. Scott Demyan

Course Reading

I don't teach from a textbook but recommend you study the relevant background reading in the following texts:

Greipsson S. (2012) Restoration Ecology. Sudbury MA, Jones & Bartlett Learning.

**Several copies are available in the Library*

Williams B.K., Szaro R.C., & Shapiro C.D. (2009) Adaptive Management: The U.S. Department of the Interior Technical Guide. Washington, DC., U.S. Department of the Interior. Available from: <http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf>

Recommended additional reading

Additional papers, reports and multi-media resources relevant to the restoration tools described on the course will be provided on Carmen. You are strongly recommended to read them and to consider the results and concepts they discuss. These resources should be taken as a starting point for further reading not as an exhaustive list.

Assessment

Your final grade will consist of the following elements:

- **Quizzes** **30% (due weeks 4, 9 and 12)**
 - Multiple-choice quizzes on the preceding course sections will be available on Carmen at three points during the semester. You will have three days to complete and submit the quizzes.
- **Final exam** **35%**



- You will answer one of four applied problem-type questions focused on material covered during the course. Your task will be to select, describe and justify appropriate restoration treatments for the given problem. This will be an open-book exam and you may bring in paper copies of course notes, textbooks, scientific papers etc. Laptops and mobile devices will not be permitted.
- **Video essay** **30% (due week 16)**
 - Students will work in pairs to identify a local ecosystem restoration challenge and create a ten-minute video essay describing the issue and what techniques they would use to solve it. Students are strongly advised to make use of the resources available from the Ohio Digital Union (<https://odee.osu.edu/digital-union>) to help with this assessment. Videos will be shared in a class with an invited audience in the final week.
- **Participation** **5%**
 - Participation will be evaluated through a register of class attendance and tracking of student engagement with on-line course materials.

Letter grades will be returned for most assessments with scores given as follows: A (100-93%); A- (92-90%); B+ (89-87%); B (86-83%); B- (82-80%); C+ (79-77%); C (76-73%); C- (72-70%); D+ (69-67%); D (66-60%); E (below 60%).

Extra credit will be awarded to students with exemplary attendance records (> 90%) and who provide evidence of participating in relevant additional activities outside the classroom (e.g. tree planting or invasive removal volunteer events)

Deadlines and penalties

Students may be granted an extension to the deadline if a good reason is given. Extensions will not be given in retrospect.

Plagiarism

The University's degrees and other academic awards are given in recognition of a student's personal achievement. All work submitted by students for assessment is accepted on the understanding that it is the student's own effort.

Plagiarism is defined as the submission or presentation of work, in any form, which is not one's own, without acknowledgement of the sources. Plagiarism includes inappropriate collaboration with others. Special cases of plagiarism can arise from a student using his or her own previous work (termed auto-plagiarism or self-plagiarism). Auto-plagiarism includes using work that has already been submitted for assessment at this University or for any other academic award.

The incorporation of material without formal and proper acknowledgement (even with no deliberate intent to cheat) can constitute plagiarism. Work may be considered to be plagiarised if it consists of:

- a direct quotation;
- a close paraphrase;
- an unacknowledged summary of a source;
- direct copying or transcription.

With regard to essays, reports and dissertations, the rule is: if information or ideas are obtained from any source, that source must be acknowledged according to the appropriate convention in that discipline; and any direct quotation must be placed in quotation marks and the source cited immediately. Any failure to acknowledge adequately or to cite properly other sources in submitted work is plagiarism.



Plagiarism is considered to be an act of fraudulence and can result in a charge of academic misconduct. More information on avoiding plagiarism can be found here:
<http://library.osu.edu/projects-initiatives/copyright-resources-center/using-materials/plagiarism>

Disabilities Statement

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu (Links to an external site.); 098 Baker Hall, 113 W. 12th Avenue.

Questions, Advice and Suggestions

We welcome suggestions for improving this course! Any questions concerning the course should be directed to Matt Davies. If this is not possible, or desirable, comments concerning the course should be raised with your academic advisor.

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