

# SYLLABUS: ENR 5560

The Dynamics of Ecosystem Restoration

Spring 2024

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## Course Information

- **Course times and location:** The course will run from the 8th January 2023 to the 22nd April 2024. Meeting times are Mondays and Wednesdays between 11:10am – 12:30pm in room 116 Kottman Hall.
- **Credit hours:** 3
- **Mode of delivery:** In-person (flipped classroom)

## Instructor

- **Name:** Jo Peacock (she/her)
- **Email:** [peacock.104@osu.edu](mailto:peacock.104@osu.edu)
- **Phone Number:** 330-263-9733
- **Office location:** 129 Williams Hall, 1680 Maddison Avenue, Wooster, OH, 44691
- **Office hours:** Tuesdays and Thursdays from 10:00am – 11:00am. [Office hours will be held via Zoom. Links to an external site.](#)
- **Preferred means of communication:**
  - Please email me directly rather than through Carmen to ensure your messages aren't diverted to spam

- Class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications)[Links to an external site.](#) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

## Teaching Assistant

- **Name:** Ningzhu Bai
- **Email:** bai.343@buckeyemail.osu.edu
- **Office hours:** Mondays and Wednesdays 12:30 - 1:30pm at Kottman Hall 382
- **Preferred means of communication:** Direct email is preferred over Carmen messaging.

## Course Prerequisites

ENR 3800 *and* ENR 4800 *or* grad standing *or* permission of instructor. We recommend that students have completed EEOB 3410 prior to taking this course

## Course Description

This course will focus on developing students' understanding of how biotic and abiotic conditions influence the response of ecosystems to varying restoration treatments. The course will consider restoration effects on both above and belowground processes to provide students with the grounding to infer how medium to long-term ecological trajectories ensue following restoration. We will examine a range of case study systems from the US and overseas. We will also pay particular attention to important ecosystem management challenges in Ohio and the Midwest. The latter will include the use of fire to restore hardwood forests undergoing "mesophication," and the control of regionally important invasive plants such as honeysuckle, tree-of-heaven, autumn olive and garlic mustard. We will consider the criteria that are used to assess restoration success including debates over the relative importance of restoration of ecosystem composition versus ecosystem function.

The aims of the course are to:

- Evaluate how abiotic, biotic and disturbance variables interact to drive changes in ecosystems undergoing restoration
- Consider how ecological processes govern the response of ecosystems to restoration actions
- Critically assess what defines restoration "success"
- Introduce interpretation of quantitative approaches to describing ecosystem dynamics

- Develop students' ability to research and critique scientific literature concerning restoration
- Provide a forum for debate on the aims, objectives and practice of restoration

## Learning Outcomes

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

- Describe a thorough understanding of how variation in disturbances and post-disturbance restoration alters the structure and function of ecosystems
- Scientifically analyze the structure and function of ecosystems undergoing restoration
- Interpret analyses of monitoring and experimental data to assess how a variety of ecosystems respond to restoration challenges.
- Formulate evidence-based strategies for the rehabilitation and restoration of disturbed ecosystems to improve their long-term stability and productivity

## Course Schedule

### Tentative weekly course schedule

WEEK	DATES	ASSIGNMENTS	TOPIC	VIDEO LECTURE	CLASS DISCUSSION
1	8 Jan 10 Jan	Presentation 1	<b>Course Introduction</b>	Restoration as the "Acid Test" of ecological knowledge	Basis for restoration
2	17 Jan	Site Management Plan	<b>Invasive Species</b>	FIELD TRIP to OSU Wetlands	Invasion ecology
3	22 Jan 24 Jan	Worksheet (in lieu of Quiz)	<b>Interpreting Statistical Analyses</b>	Reading scientific papers: strategic reading & interpreting statistical results	Interpreting statistical analyses
4	29 Jan 31 Feb	Presentation 2 Paper Summary	<b>Targets for Restoration (1)</b>	Paleoecology	Applied historical ecology
5	5 Feb 7 Feb	Quiz Paper Summary	<b>Oak-hickory Forests</b>	Fire in central hardwood forests & mesophication	The oak bottleneck
6	12 Feb 14 Feb	Quiz Paper Summary	<b>Prairies</b>	Introduction to pyric herbivory	Shifting mosaics
7	29 Feb 21 Feb	Quiz Paper Summary	<b>Sagebrush-steppe</b>	Non-equilibrium dynamics State and transition models	Tracking community trajectories
8	26 Feb 28 Feb	Quiz Paper Summary	<b>Longleaf Pine Forests</b>	Longleaf pine ecosystems	Using undesirable species as a restoration bridge

9	4 March 6 March	Presentation 3 Quiz	<b>Targets for Restoration (2)</b>	Reference information	Selecting appropriate reference information
10	11 March 13 March	None	<b>SPRING BREAK</b>		
11	18 March 20 March	Quiz Paper Summary	<b>Ponderosa Pine Forests</b>	Restoring fuel structures	Fuel treatment effectiveness
12	25 March 27 March	Quiz Paper Summary	<b>Northern Peatlands</b>	Peatland ecology, degradation & restoration	Peatland carbon cycling
13	1 April 3 April	Quiz (TBC) Paper Summary	<b>Traditional Ecological Knowledge</b>	TBC	Biocultural restoration
14	8 April 10 April	Quiz Paper Summary	<b>Tropical Savannas</b>	Forest-grassland ecotones in the neotropics	Effects of grazing control on gallery forest habitats
15	15 April 17 April	Presentation 4a & 4b	<b>Targets for Restoration (3): Applying the "Novel Ecosystem" Concept</b>	NA	Novel ecosystem debate
16		Final Paper Set	<b>NA</b>	NA	NA

## How This Course Works

**This course will utilize “flip-teaching”** to maximize active learning, peer-to-peer communication and opportunities for discussion and debate. Decisions behind restoration treatments are often based on moral and philosophical considerations as well as our scientific knowledge. Gaining skills to interpret, evaluate, present and debate ecological knowledge is essential.

Flipped teaching means that, outside the classroom, each week you'll watch a recorded video lecture, complete set readings and take a quiz on the material you've learned. In-person classes will involve structured discussions and debates regarding the material you've read, and group presentations based on an associated activity. **Generally** each week, paper discussions will be held on Mondays, then on Wednesdays you will present your interpretation of the findings to the rest of the class.

**Adequate preparation outside of and participation inside the classroom is essential to your and your classmates' success on the course.**

**Mode of delivery:** We will have weekly in-person classes focused on interactive discussion activities. The rest of your work, including recorded video lectures, quizzes, etc. can be found on Carmen and can be completed around your own schedule during the week.

**Pace of activities:** This course is divided into **Modules** that are released one week ahead of time. Students are expected to keep pace with relevant deadlines.

**Credit hours and work expectations:** This is a 3 credit-hour course. According to [Ohio State bylaws on instruction](https://go.osu.edu/credithours)[Links to an external site.](https://go.osu.edu/credithours) (go.osu.edu/credithours), each week students should expect to spend around 2-3 hours on homework per hour of class time if they wish to receive a passing grade.

**Attendance and participation requirements:** Research shows that regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- **Attendance and participation is a required component of the course:** You are expected to attend in-person classes as well as log in to the Carmen course for online activities (watching video lectures, taking quizzes, accessing the week's reading material). All lectures will be recorded and posted on Carmen prior to class. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **Office hours:** Attendance at office hours is optional.

## Required Materials

Though this course does not have a textbook the following are the recommended accompanying texts:

- Hobbs R.J. & Suding K.N. (2013). *New Models for Ecosystem Dynamics and Restoration*. Washington DC, Island Press.

- Leopold A. (1968) A Sand County Almanac. Oxford, Oxford University Press.
- Howell E.A., Harrington J.A. & Glass S.B. (2010) Introduction to Restoration Ecology. Washington DC, Island Press.
- 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: <https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/TechGuide.pdf>  
[inks to an external site.](#)

**Discussion Texts:** A set reading will be provided on Carmen each week. An announcement will be made when they are available. The set readings will form the basis for subsequent in-class discussions and activities. *It is essential you read these before coming to class.*

**Supplementary Materials:** Additional papers, reports and multi-media resources relevant to the skills and concepts developed 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 materials should be taken as a starting point for further reading, not as an exhaustive list.

## Grading and Faculty Response

### How Your Grade is Calculated

Table of assignment weights	
Assignment Category	Points
Lecture Quizzes	15
Paper Summaries	25
Presentations	25
Final Paper	25
Participation	10

### Descriptions of Major Course Assignments

Full details for all assignments and submission instructions will be posted on Carmen.

Please notify the instructors if you are unable to attend class due to ill health (or for any other reasonable reason). You will be excused from all assessments for the relevant week(s). Students must, however, complete at least 60% of each assessment group to complete the course.

### **Lecture Quizzes    15%**

**Description:** Short multiple-choice quizzes on the recorded video lectures and set readings will be posted on Carmen. These should be completed by midnight each Friday. Quizzes will be graded out of ten. If you have completed all of the quizzes by the end of the course, the two lowest scores will be dropped from the calculation of your final grade. In some weeks, alternative short assignments may be set in lieu of a quiz.

### **Paper Summaries    25%**

**Description:** From week four onwards you will regularly submit max. 500 word summaries of the paper discussed that week. These should be completed by 5pm each Saturday. The summary should point to the main findings in the paper and describe the key issues that emerged during class discussions. If you have completed all of the assigned paper summaries by the end of the course, the five best scores will contribute to your final grade. Read the associated guidance for the paper summaries carefully.

### **Presentations    25%**

**Description:** At five points in the semester (shown in green in the schedule) you will complete group activities related to the discussion topic. This could be a presentation or similar task. A generalized rubric for grading student presentations has been provided for guidance, although the appropriate content will vary from week to week depending on the specific topic. Each presentation should be delivered by 2-3 students from the group. All students must present at least twice during the semester. Presentation feedback will be delivered to your group as a whole, and your group will receive a single combined score. Your final grade will be calculated as the average of your two best group scores.

### **Final paper    25%**

**Description:** Paper questions will be released during the last week of teaching. You will answer one of four essay-type questions. You are expected to research your chosen question and provide an answer that builds on evidence from the **primary literature**.

### **Participation    10%**

**Description:** Each week following the in-class discussions you will submit your completed discussion sheets. These will be evaluated for evidence of engagement in active learning through note-taking and completion of the questions. Discussion sheets can be submitted on paper or by uploading a scan or photo of them to Carmen.

Participation will also be evaluated through a register of class attendance, tracking of student contributions to in-class discussions, and evaluation of engagement with materials provided on Carmen.



Towards the end of the course, peer evaluation will be used to assess students' participation in group activities and ensure that all students have contributed adequately to the completion of each week's activity. Where there is evidence a student has not contributed satisfactorily to a group's work and discussions, a penalty of up to 5% may be applied to their final grade.

Where a student has an attendance record < 80% (excluding excused absences) a 5% penalty will be applied to the final grade.

## Late Assignments

Please refer to Carmen for due dates. For Lecture Quizzes and Paper Summaries, students may be granted an extension to the deadline if a good reason is provided. Where an extension has not been given, a penalty of 5% per 24 hours (or part thereof) late will be applied to all submissions up to a maximum of 5 days after which a grade of zero will be returned. Extensions will not be given in retrospect. **As noted above, uncompleted/unsubmitted Lecture Quizzes and Paper Summaries (i.e. zero scores) will NOT entitle you drop your worst scores. In this instance, ALL zero scores will contribute to your final grade calculation.**

## Grading Scale

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%).

## Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact us first through our Ohio State email address. We will reply to emails within **48 working hours and on days when class is in session at the university**.
- **Class announcements:** We will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](#)[Links to an external site.](#) ([go.osu.edu/canvas-notifications](https://go.osu.edu/canvas-notifications)) to ensure you receive these messages.
- **Grading and feedback:** For assignments submitted before the due date, We will try to provide feedback and grades within **fourteen days**. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.

**Graduate students** will be expected to perform at a higher level than undergraduates on assignments and will be graded accordingly. Graduate students are expected to take a leadership role in small group discussions, to ensure discussions remain on-track and to coordinate group assignments.

## Extra credit

A maximum of 5 points of extra credit (equivalent to 5% of your final grade) will be awarded to students for

1. Evidence of **participating in relevant additional activities outside the classroom** (e.g. tree planting or invasive removal volunteer events). Normally this can take the form of emailing a selfie at, and short-description of, the event concerned.

## Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's Code of Student Conduct ([studentconduct.osu.edu](http://studentconduct.osu.edu) [Links to an external site.](#)), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's Code of Student Conduct and this syllabus may constitute "Academic Misconduct."

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct ([go.osu.edu/coam](https://go.osu.edu/coam))
- Ten Suggestions for Preserving Academic Integrity ([go.osu.edu/ten-suggestions](https://go.osu.edu/ten-suggestions))

## Discussion and Communication Guidelines

- **Writing style:** You should remember to write using good grammar, spelling, and punctuation.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. There is no need to participate in class discussions as if you were writing a research paper. We will provide specific guidance for discussions on controversial or personal topics.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For textbooks or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen assignment page.

## Technology Information

### Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection.
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for [technology and internet access](https://go.osu.edu/student-tech-access) ([Links to an external site.](https://go.osu.edu/student-tech-access) ([go.osu.edu/student-tech-access](https://go.osu.edu/student-tech-access))).

### Required Software

**Microsoft Office 365:** All Ohio State students are now eligible for free Microsoft Office 365. Visit the [installing Office 365](https://go.osu.edu/office365help) ([Links to an external site.](https://go.osu.edu/office365help) ([go.osu.edu/office365help](https://go.osu.edu/office365help)) help article for full instructions.

### CarmenCanvas Access

You will need to use [BuckeyePassLinks to an external site.](https://buckeyepass.osu.edu) (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a DeviceLinks to an external site.](https://go.osu.edu/add-device) (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes, good for 365 days, that can each be used once.
- [Install the Duo Mobile applicationLinks to an external site.](https://go.osu.edu/install-duo) (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at [614-688-4357 \(HELP\)](tel:614-688-4357) and IT support staff will work out a solution with you.

## Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvasLinks to an external site.](https://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)
- [CarmenZoom virtual meetingsLinks to an external site.](https://teaching.resources.osu.edu/toolsets/carmenzoom) (https://teaching.resources.osu.edu/toolsets/carmenzoom)

## Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

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- **Self Service and Chat:** [go.osu.edu/itLinks to an external site.](https://go.osu.edu/it)
- **Phone:** [614-688-4357 \(HELP\)](tel:614-688-4357)
- **Email:** [servicedesk@osu.edu](mailto:servicedesk@osu.edu)

## Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from

harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact:

1. Online reporting form at [equity.osu.eduLinks to an external site.](https://equity.osu.edu/Links to an external site.),
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or Email [equity@osu.edu](mailto:equity@osu.edu)

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member."

This course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles are located on the Carmen site for this course; and can also be found at <https://go.osu.edu/principlesofcommunityLinks to an external site.> For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.eduLinks to an external site.>). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) through the Office of Institutional Equity (<https://equity.osu.edu/Links to an external site.>).

## Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The

Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand)[Links to an external site.](#) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://suicidepreventionlifeline.org)[Links to an external site.](#) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). [The Ohio State Wellness app](https://go.osu.edu/wellnessapp)[Links to an external site.](#) (go.osu.edu/wellnessapp) is also a great resource.

## Accessibility Accommodations for Students with Disabilities

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. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](#)[Links to an external site.](#) After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's [request process](#)[Links to an external site.](#), managed by Student Life Disability Services.

### Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)
- Website: [slds.osu.edu](https://slds.osu.edu)[Links to an external site.](#)
- Email: [slds@osu.edu](mailto:slds@osu.edu)
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)[Links to an external site.](#)

### Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](#)[Links to an external site.](#) (osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](#)[Links to an external site.](#) (go.osu.edu/zoom-accessibility)

# Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.