

Course Syllabus

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Impacts of Covid-19: *Delivery of some externally provided training and certification normally included on the course curriculum has unfortunately been impacted for Fall 2021. We are currently still negotiating with the Ohio Forestry Association around delivery of chainsaw training. We anticipate it being possible, but it is subject to being able to procure individual PPE. Trainings may be cancelled depending on the progress of the pandemic. IF a training session is possible this will be held on a single day over a weekend with an option to sign-up for a Saturday or Sunday session. Pesticide applicator training will still be available during Week 2 of the course and will be delivered on-line. We will offer a single session on Friday September 3rd depending on instructor availability. Students from both sections will be eligible to attend and those who cannot join live will be able to watch a recording. We are currently working with the Ohio Department of Agriculture to try and offer an exam on-campus likely at the end of the semester. This will again be subject to the status of Covid and OSU policies. Given the uncertainty at this time both the chainsaw training and real ODA exam (though not the training) will be optional with extra credit awarded for participation.*

Important Note: This course will be delivered in person in an outdoor classroom. Students should follow all University and course policies designed to protect them, their classmates and their community from Covid-19. Students failing to adhere to these policies will be removed from the class. [A page describing Covid-related policies and advice for this course is provided for your reference.](#)

Important Note: This course will involve using hazardous equipment such as hand tools, powered machinery and herbicides. Extreme care must be taken when using such tools. You will be given a full safety briefing and training prior to their use which must be followed. **Students failing to operate tools in a safe and responsible manner may be removed from participation and will fail the course**

Course Overview

Course description: Developing workable solutions to restoration challenges, and understanding the ecological dynamics of systems undergoing restoration, requires a thorough appreciation of the techniques involved in restoration and the constraints on their application. This course aligns our specialization with the Society for Ecological Restoration's statement that programs should train "professionals who understand not only the science of restoration ecology *but also the management practices* and social factors that lead to successful project implementation". This course will provide students with the opportunity to develop practical skills relevant to restoration ecology. The course will introduce students to key skills including: ecological mapping and monitoring, manual and chemical techniques for invasive control, out-planting of native species, seed collection, plant propagation, ground preparation and erosion control. As part of the course, students will complete training in pesticide safety and application, and will complete training and assessments that will provide them with Occupational Health and Safety certification for key tasks

Prerequisites: ENR 3800 [*Principles and tools of ecosystem restoration*] or permission from the instructor.

Course aims

Course aims

The aims of the course are to:

- Utilize key restoration tools and interventions, and consider their ecological outcomes, in a case-study ecosystem
- Discuss the logistical, practical, financial and ecological constraints on restoration projects
- 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
- Consider the philosophical and ecological concepts which underpin decision-making in ecosystem restoration

Teaching methods

This is a service-learning course that teaches practical field skills. Students will be working in the field, lab or greenhouse for the majority of the course. Key skills will be introduced and demonstrated in the field before students are given the opportunity to apply them in a safe and effective manner. Students will be required to reflect on the complexities, pitfalls, errors or issues inherent in the application of key restoration techniques.

Intended Learning Outcomes

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

1. Describe and implement key practical techniques used during ecosystem restoration
2. Safely and effectively use hand tools during site restoration
3. Safely and effectively apply herbicides to control invasive species
4. Prepare sites, select and out-plant appropriate native species
5. Assess challenges associated with the implementation of site restoration management plans
6. Design and complete field monitoring to assess the effectiveness of restoration treatments

Course Schedule

Course dates and times

- The course will run from **August 27th 2020 to December 3rd 2020**
- Classes are scheduled on **Fridays between 9:10 am and 1:20 pm.**
- The week-to-week curriculum is shown below - this may be subject to change.

Course location

- **Weeks 1 and 3-13:** Meet in the car park for the the [Poultry Brooding House](https://www.google.com/maps/place/Poultry+Brooding+House+2,+722+W+Lane+Ave,+Columbus,+OH+43221/@40.007231,83.0296082) (<https://www.google.com/maps/place/Poultry+Brooding+House+2,+722+W+Lane+Ave,+Columbus,+OH+43221/@40.007231,83.0296082>) at the Chadwick Arboretum North. The address is: The Nationwide & Ohio Farm Bureau 4-H Center, 2201 Fred Taylor Dr, Columbus
- Directions can be found here: <https://bit.ly/2IfsK4F> (<https://bit.ly/2IfsK4F>)

- Directions can be found here: <https://bit.ly/2J1317L> <https://bit.ly/2J1317L>.

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- **Week 2:** No in-person attendance required, lecture will be delivered online

Course curriculum

Exact order of classes may be altered due to weather conditions and phenological considerations.

Wk	Date	Class topic	Skills introduced
1	27/Aug	Course introduction	Overview of course structure and reconnaissance of restoration site.
2	3/Sep	Pesticide Training*	Use and application of herbicides to control invasive species.
3	10/Sep	Site mapping and scoping	Three modules: <ul style="list-style-type: none"> ■ Topographic surveying and section drawing ■ Using a GPS, creating restoration maps and plan seeding and planting ■ Broad-scale vegetation classification and method long-term vegetation monitoring.
4	17/Sep		
5	24/Sep		
6	1/Oct	Seed collection and controlling invasive species	Two Modules: <ul style="list-style-type: none"> ■ Seed collection and drying. ■ Using saws and cutters to remove woody vegetation. Follow-up herbicide control.
7	8/Oct		
8	15/Oct	AUTUMN BREAK	No class
9	22/Oct	Seed collection and controlling invasive species (cont.)	
10	29/Oct	Seed processing and planting	

11	5/Nov	Erosion control	Applying mulch, erosion matting and constructing si fences. Monitoring erosion.
12	12/Nov	Applying seed mixes in the field	Ground preparation, calculating seeding rates and seeding using manual broadcasting methods.
13	19/Nov	Outplanting woody vegetation 1	Planting and protecting woody vegetation (trees and shrubs). Direct seeding woody plants.
14	26/Nov	INDIGENOUS PEOPLES' DAY	No class
15	3/Dec	Outplanting woody vegetation 2 and woodland management	Planting and protecting woody vegetation (trees and shrubs). Direct seeding woody plants. Thinning, limb and pruning, snag creation.
16	10/Dec	Report preparation workshop**	Preparing graphs and figures for the final report (onl

*This lecture will be delivered online during class time. Details to follow.

**This class is scheduled after the formal end of the teaching semester. Attendance is optional but will assist you in preparing your final reports

Assessment

Your final grade will consist of the following elements:

Quizzes 20% (due each week)

- Multiple-choice quizzes on skills and techniques will be posted on Carmen at the end of most weeks. You will have three days to complete and submit each quiz. Your worst two quiz grades will be dropped.


Pesticide Mock Exam 5% (due week 3)

A stand-alone quiz mimicking the formal ODA exam will be posted following completion of the pesticide training in Week 2.

Reflective skills diary 25% (due each week)

- Each week you will submit ca. 300 word reflective skills diary entry.
- Your skills diary will provide documentary evidence of the tasks you've completed, knowledge you've gained and skills you've acquired on each day of the course. This should include consideration of their importance in

the context of restoration ecology. You should also critically consider their ecological justification through reference to relevant scientific literature.

- The diary will thus give you the opportunity to describe key practical techniques you've learnt (ILO 1); provide evidence that you are aware of the safety considerations of key restoration techniques (ILOs 2-4); and show you know how to efficiently outplant native plant materials (ILO 5).
- An [example of a skills diary entry](https://osu.instructure.com/courses/108719/files/33668620/download?download_frd=1).  (https://osu.instructure.com/courses/108719/files/33668620/download?download_frd=1) is provided.
- Your two lowest scores will be dropped

Occupational Health and Safety Training 10% (due in weeks 3, 5 and 8)

- Students MUST complete required OSU OHS training prior to engaging in any associated activities in the field. Training courses are accessed through OH: <https://ehs.osu.edu/occupational-health-and-safety-training> [_ \(https://ehs.osu.edu/occupational-health-and-safety-training\)](https://ehs.osu.edu/occupational-health-and-safety-training)_. You must demonstrate completion of the following courses by the given dates:
 - Worker Protection Standard (Pesticide Handler) - due week 3
 - Hand and Power Tool Safety - due week 5
 - Worker Protection Standard (Worker) - due week 8

Risk assessment 10% (due week 7)

- Using a standardized template and referring to a provided example, students will prepare a risk assessment for a restoration workday focused on invasive species control where hand tools and herbicides will be used.

Site Scoping Project Write Up 30% (Group project - due during exam week)

- Using data and skills developed during weeks 3-5, and information compiled through group work carried out outside of class time, students will provide a site scoping report for the restoration site that includes:
 - A section drawing and map of the restoration site showing its intended ecological structure and the location of treatment areas.
 - Results of baseline vegetation monitoring surveys.

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). Extra credit can also be gained by demonstrating completion of other relevant OHS training courses and by organizing to attend a Pesticide License Exam at the Ohio Department of Agriculture

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. Penalties may be applied for incomplete assessments.

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> [\(http://library.osu.edu/projects-initiatives/copyright-resources-center/using-materials/plagiarism\)](http://library.osu.edu/projects-initiatives/copyright-resources-center/using-materials/plagiarism)

Course Reading

The following texts are recommended for this course:

Apfelbaum S.I. & Haney A.W. (2012) Restoring Ecological Health to Your Land. Washington D.C., Island Press.

Packard S., Mutel C.F. & Jordan W.R. (2006) The Tallgrass Restoration Handbook: For Prairies, Savannas, and Woodlands. Washington D.C., Island Press.

Recommended additional reading

Kurtz C. (2013) A Practical Guide to Prairie Reconstruction. Iowa City, University of Iowa 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:

<http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf>
[\(http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf\)](http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf)

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

concepts they discuss. These resources should be taken as a starting point for further reading not as an exhaustive list.

Fieldwork Safety

Safety during fieldwork is the prime responsibility of the individuals undertaking the fieldwork. Safe conduct extends to journeys to and from field locations. Responsible and careful behaviour is thus an obligation for all students at all times. Infringement of this safety code, or indulging in any activity which is prejudicial to safety during a field course, will be regarded as a very serious matter.

Specifically all students must:

1. Ensure they have read the risk assessments before fieldwork commences. Risk assessments will be available on Carmen and will be distributed at the start of the course.
2. Obey all safety instructions given by the course convener, land/property managers and external training experts.
3. Wear appropriate clothing for the type of weather and terrain likely to be encountered. For any research in which fieldwork is conducted in the countryside the following guidelines should be followed. Wind and waterproof outer jacket and trousers are necessary. Walking should be worn for work off surfaced roads or paths. An appropriate number of layers of warm clothing and waterproofs should be taken.
4. When working in hot and sunny conditions, ensure you have a plenty supply of fluid, and take care to avoid exposure to strong sun – wear sunscreen and a hat
5. If instructed to do so, wear required personal protective equipment in the field until such time as the responsible party instructs that it is safe to remove them.
6. Report any injury or illness to the course convener immediately, however trivial.
7. Inform the course convener about any prior illness or medical condition which might re-occur during the fieldwork. It is the student's responsibility to ensure that they have an up-to-date record of vaccination cover (such as for tetanus).
8. Conduct themselves properly and with respect for others whilst in field residences or host organisation. Anti-social behavior is likely to lead to deterioration in safety and will not be tolerated. Follow rules and guidelines given by property owners or managers.

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.

Counseling and Consultation Services/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

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. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org.

David Wirt (wirt.9@osu.edu (<mailto:wirt.9@osu.edu>)) is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.

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 the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. 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 <http://osce.edu/principles-of-community>. For additional information

at <https://go.osu.edu/principlesofcommunity>. [_ \(https://go.osu.edu/principlesofcommunity\)](https://go.osu.edu/principlesofcommunity). For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.edu> [_ \(https://equityandinclusion.cfaes.ohio-state.edu\)](https://equityandinclusion.cfaes.ohio-state.edu)). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at <https://studentlife.osu.edu/bias/report-a-bias-incident> [_ \(https://studentlife.osu.edu/bias/report-a-bias-incident.aspx\)](https://studentlife.osu.edu/bias/report-a-bias-incident.aspx).

Questions, Advice and Suggestions

Specific questions regarding course assessments and organization can be directed to either of the course leaders. Questions about content, technical questions about assessments or for help understanding materials covered should be directed to the relevant instructor.

Course leader

Dr. G. Matt Davies

412B Kottman Hall

E-mail: davies.411@osu.edu
[_ \(mailto:davies.411@osu.edu\)](mailto:davies.411@osu.edu)

Course co-leader





Jo Kingsbury











400 Kottman Hall












E-mail: kingsbury.20@osu.edu
[_ \(mailto:kingsbury.20@osu.edu\)](mailto:kingsbury.20@osu.edu)







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

Course Summary:

Date	Details	Due
Thu Sep 2, 2021	 Week 1 - Reflective Skills Diary: Site Introduction and Walkover (https://osu.instructure.com/courses/108719/assignments/2378587)	due by 11:59am
Thu Sep 9, 2021	 Week 2 - Pesticide Training Quiz (https://osu.instructure.com/courses/108719/assignments/2381235)	due by 11:59am
	 OHS Worker Protection Standard Certificate Upload - Pesticide Handler (https://osu.instructure.com/courses/108719/assignments/2378579)	due by 11:59am
Thu Sep 23, 2021	 OHS Training Certificate Upload - Hand and Power Tool Safety (https://osu.instructure.com/courses/108719/assignments/2378578)	due by 11:59am

Date	Details	Due
Thu Sep 30, 2021	 Week 3-5 - Quiz: Baseline Vegetation Monitoring https://osu.instructure.com/courses/108719/assignments/2378564	due by 11:59am
	 Week 3-5 - Quiz: Using a GPS, Creating Restoration Maps and Planning Seeding and Planting https://osu.instructure.com/courses/108719/assignments/2442958	due by 11:59am
	 Weeks 3-5 - Quiz: Topographic Surveying https://osu.instructure.com/courses/108719/assignments/2378568	due by 11:59am
	 OHS Worker Protection Standard Certificate Upload - Worker https://osu.instructure.com/courses/108719/assignments/2378580	due by 11:59am
	 Week 3-5 - Reflective Skills Diary: Baseline Vegetation Monitoring in Restoration https://osu.instructure.com/courses/108719/assignments/2378589	due by 11:59am
	 Week 3-5 - Reflective Skills Diary: Topographic Surveying and Section Drawing https://osu.instructure.com/courses/108719/assignments/2378591	due by 11:59am
Thu Oct 28, 2021	 Week 3-5 - Reflective Skills Diary: Using a GPS, Creating Restoration Maps and Planning Seeding and Planting https://osu.instructure.com/courses/108719/assignments/2442959	due by 11:59am
	 Week 6-8 - Quiz: Seed Collection https://osu.instructure.com/courses/108719/assignments/2441690	due by 11:59am
	 Week 6-9 - Quiz: Controlling Invasive Species https://osu.instructure.com/courses/108719/assignments/2378575	due by 11:59am
	 Week 6-9 - Quiz: Seed Collection https://osu.instructure.com/courses/108719/assignments/2378574	due by 11:59am

Date	Details	Due
Thu Nov 4, 2021	 Week 6-9 - Reflective Skills Diary: Controlling Invasive Species (https://osu.instructure.com/courses/108719/assignments/2378592)	due by 11:59am
	 Week 6-9 - Reflective Skills Diary: Seed Collection (https://osu.instructure.com/courses/108719/assignments/2378593)	due by 11:59am
	 Week 10 - Quiz: Seed Cleaning and Processing (https://osu.instructure.com/courses/108719/assignments/2441704)	due by 11:59am
	 Week 10 - Quiz: Seed Processing (https://osu.instructure.com/courses/108719/assignments/2378571)	due by 11:59am
	 Risk Assessment (https://osu.instructure.com/courses/108719/assignments/2378581)	due by 11:59am
Thu Nov 11, 2021	 Week 10 - Reflective Skills Diary: Seed Processing and Planting (https://osu.instructure.com/courses/108719/assignments/2441705)	due by 11:59am
	 Week 11 - Quiz: Erosion Control (https://osu.instructure.com/courses/108719/assignments/2378565)	due by 11:59am
Thu Nov 18, 2021	 Week 11 - Reflective Skills Diary: Erosion Control (https://osu.instructure.com/courses/108719/assignments/2378584)	due by 11:59am
	 Week 12 - Quiz: Applying Seed Mixes in the Field (https://osu.instructure.com/courses/108719/assignments/2378573)	due by 11:59am
Thu Dec 2, 2021	 Week 12 - Reflective Skills Diary: Applying Seed Mixes in the field (https://osu.instructure.com/courses/108719/assignments/2378583)	due by 11:59am
	 Week 13 - Quiz: Out-planting Woody Vegetation (https://osu.instructure.com/courses/108719/assignments/2378570)	due by 11:59am

Date	Details	Due
Thu Dec 9, 2021	 Week 13 - Reflective Skills Diary: Out Planting Woody Vegetation (https://osu.instructure.com/courses/108719/assignments/2378585)	due by 11:59am
	 Week 15 - Quiz: Direct Seeding and Woody Out-planting 2 (https://osu.instructure.com/courses/108719/assignments/2378567)	due by 11:59am
	 Week 15 - Reflective Skills Diary: Direct Seeding and Woody Out- planting 2 (https://osu.instructure.com/courses/108719/assignments/2378586)	due by 11:59am
	 Extra Credit (https://osu.instructure.com/courses/108719/assignments/2378576)	
	 Final Project - Site Scoping Report (https://osu.instructure.com/courses/108719/assignments/2378577)	
	 Roll Call Attendance (https://osu.instructure.com/courses/108719/assignments/2378582)	