NRES 362
Ecology of Invasive Species

Tues & Thurs, 5:00 to 6:20 pm
Turner Hall W-223

1. Instructor

Dr. Eric R. Larson, erlarson@illinois.edu
Office Hours: By request (mornings good)

2. Course Content

Biological invasions are one form of global change that characterizes the Anthropocene, as humans are currently transporting organisms to new regions – often with unanticipated consequences for native species, ecosystems, and the economy – at rates in excess of those in pre-historic times.

In this course, we will examine the causes, consequences, and management responses to invasive species, with an emphasis on understanding the introduction, establishment, spread, and impact stages of the invasion process. We will also identify management strategies for preventing new invasions and mitigating impacts of established invaders in freshwater, marine, and terrestrial ecosystems.

3. Learning Objectives

By the end of the course, students will:

3.1) Be able to define invasive species and understand the uses of related terminology (exotic, alien, weed, introduced, etc.)

3.2) Place the current rate of species invasions in historic and pre-historic context

3.3) Identify the distinct introduction, establishment, spread, and impact stages of the invasion process

3.4) Understand the roles of propagule pressure and disturbance in the establishment of invasive species

3.5) Characterize common impacts of invasive species on native species, ecosystems, human health and the economy

3.6) Relate management tools like risk assessment and containment or eradication to their appropriate invasion stage

3.7) Identify major invasive species of Illinois and globally

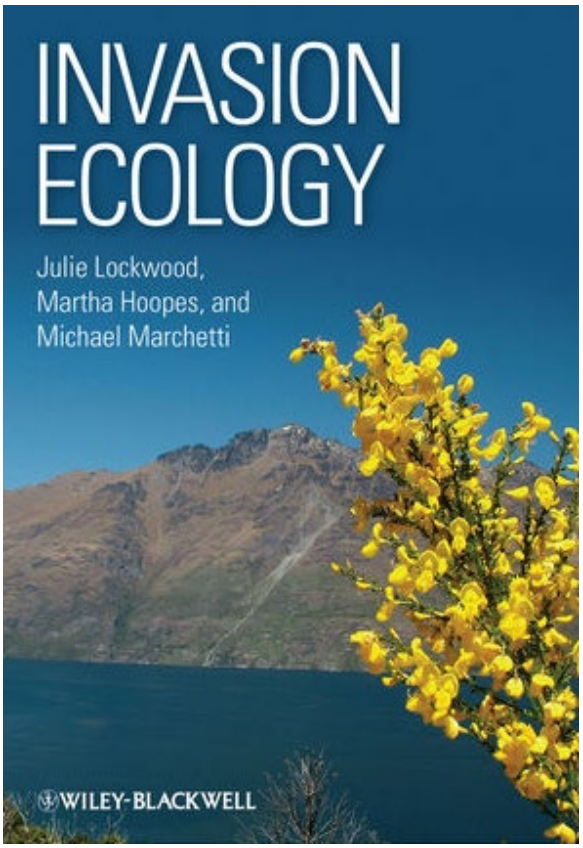
3.8) Improve scientific literacy by engaging with major debates in the field of invasion biology and develop skills related to evaluating the validity of claims using research in primary scientific literature

3.9) Develop written and oral communication skills through a class-long project resulting in a paper and presentation

4. Text (Required)

Invasion Ecology, 2nd Edition (2013)

Julie Lockwood, Martha Hoopes, Michael P. Marchetti, Wiley-Blackwell



The textbook is available as an online edition through the library website and on reserve at the Funk ACES library. Additional readings from the primary scientific literature will provided through the class Canvas site.

5.1 Assessment

This class uses the following assessments, with assignment and due dates identified on the class schedule (end of syllabus). Papers and invasive species bingo should be e-mailed to the instructor on their due date by 11:59 pm. Quizzes and the final exam (Tuesday, May 13th) will be administered online through Canvas.

Paper		
Part 1	**–**	**10**
Part 2	**–**	**10**
Part 3	**–**	**20**
Presentation	**–**	**10**
Bingo	**–**	**10**
Quiz 1	**–**	**5**
Quiz 2	**–**	**5**
Quiz 3	**–**	**5**
Quiz 4	**–**	**5**
Final Exam	**–**	**20**
TOTAL		**100**

Late policy: Papers and invasive species bingo will be penalized 10% of the possible grade (e.g., 1 point if 10 possible) for every day late. Quizzes and the final exam will open on Canvas at 8 am and close for completion by 11:59 pm on their scheduled date. In-person presentations cannot be made up if missed.

5.2 Grade Scale

A+	**97 - 100**	**C**	**73 - 76.9**
A	**93 - 96.9**	**C-**	**70 - 72.9**
A-	**90 - 92.9**	**D+**	**67 - 69.9**
B+	**87 - 89.9**	**D**	**63 - 66.9**
B	**83 - 86.9**	**D-**	**60 - 62.9**
B-	**80 - 82.9**	**F**	**< 59.9**
C+	**77 - 79.9**		

6.1 Academic Integrity

The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: http://studentcode.illinois.edu/. Academic dishonesty may result in a failing grade. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

6.2 Generative AI Policy

Generative AI tools cannot be used in the completion of quizzes or the final exam. Use of generative AI for these class assessments may result in loss of all points associated with the quiz or exam. Generative AI can be used to assist with literature review and synthesis for the class-long invasive species report (both paper and presentation), which will be addressed in documents introducing the report. However, generative AI cannot be used to produce any writing for the invasive species report. A short (one to two sentence) generative AI statement identifying how you used this tool should accompany each component of the invasive species report. As the course instructor, I will not use generative AI for any purpose, including grading or providing feedback on your work.

7. Students with Disabilities

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. DRES provides students with academic accommodations, access, and support services. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail a message to disability@illinois.edu. Visit https://www.disability.illinois.edu/ for more information.

8. Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See https://registrar.illinois.edu/academic-records/ferpa/ for more information on FERPA.

9. Sexual Misconduct Policy and Reporting

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options. A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found at https://wecare.illinois.edu/resources/students/#confidential

Other information about resources and reporting is available at https://wecare.illinois.edu/.

10. Inclusivity

The effectiveness of this course is dependent upon the creation of an encouraging and safe classroom environment. Exclusionary, offensive or harmful speech (such as racism, sexism, homophobia, transphobia, etc.) will not be

tolerated and in some cases is subject to University harassment procedures. We are all responsible for creating a positive and safe environment that allows all students equal respect and comfort. I expect each of you to help establish and maintain an environment where you and your peers can contribute without fear of ridicule or intolerant or offensive language.

11. Emergency Responses

Emergency response recommendations can be found at the following website: http://police.illinois.edu/emergency-preparedness/. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/.

NRES 362 - Ecology of Invasive Species

Dr. Eric R. Larson

Spring 2026 Schedule

KEY: Topic
Reading
Assessment

Week	Tuesday	Activities	Thursday	Activities
1	Jan. 20	Class intro and syllabus review	Jan. 22	Invasive species terminology *Lockwood et al. Chapter 1* **Paper p.1 Assigned (Due Feb. 13)**
2	Jan. 27	Invasion rates through time *Lockwood et al. Chapter 3*	Jan. 29	Transport and introduction of invasive species *Lockwood et al. Chapter 2*
3	Feb. 3	Disturbance and establishment *Lockwood et al. Chapter 5* **Quiz 1**	Feb. 5	Propagule pressure and establishment *Lockwood et al. Chapter 4*
4	Feb. 10	Propagule pressure continued *Van Holle and Simberloff 2005*	Feb. 12	Biotic interactions and establishment *Lockwood et al. Chapter 6* **Paper p.1 Due**
5	Feb. 17	Modeling establishment *Peterson 2003*	Feb. 19	Career planning (summer, post-graduation) **Invasive Bingo Assigned (Due May 7)**

Week	Tuesday	Activities	Thursday	Activities
6	Feb. 24	Geographic spread of invaders *Lockwood et al. Chapter 7*	Feb. 26	Ecological spread of invaders *Lockwood et al. Chapter 8* **Paper p.2 Assigned (Due Apr. 1)**
7	Mar. 3	Collapse of invasive populations *Simberloff and Gibbons 2004*	Mar. 5	Genetic impacts of invasive species *Lockwood et al. Chapter 9* **Quiz 2**
8	Mar. 10	Individual and population impacts *Langkilde 2009*	Mar. 12	Community and ecosystem impacts *Higgins and Vander Zanden 2010*
9	Mar. 18	SPRING BREAK	Mar. 20	SPRING BREAK
10	Mar. 24	Impact synthesis *Lockwood et al. Chapter 10*	Mar. 26	Evolution of invasive species *Lockwood et al. Chapter 11* **Quiz 3**
11	Mar. 31	Climate change and invasive species *Lockwood et al. Chapter 14* **Paper p.2 Due**	Apr. 2	Predicting invasive species *Kolar and Lodge 2002* **Paper p.3 (due May 7) & presentation Assigned**
12	Apr. 7	Preventing new invasions *Lockwood et al. Chapter 12*	Apr. 9	Early eradication of invaders *Lockwood et al. Chapter 13*
13	Apr. 14	Maintenance control of invasions *Bethke et al. 2018*	Apr. 16	Economic cost of invaders. Do invasive species matter? *Pimentel et al. 2005, Davis et al.* 2011

Week	Tuesday	Activities	Thursday	Activities
14	Apr. 21	In-class presentations **Quiz 4**	Apr. 23	In-class presentations
15	Apr. 28	In-class presentations	Apr 30	In-class presentations
16	May 5	In-class presentations	May 6 (Wed)	**Invasive Species Bingo (due)** **Paper p.3 Total (Due)**
17	May 8 - 14	**Final Exam** TBD		

References – Additional Readings

Bethke, T., C. Evans and K. Gage. 2018 *Management of Invasive Plants and Pests of Illinois.*

Davis, M. A., M.K. Chew, R.J. Hobbs, A.E. Lugo, J.J. Ewel, G.J. Vermeij et al. 2011. Don't judge species on their origins. *Nature* 474:153-154.

Higgins, S. N. and M.J. Vander Zanden. 2010. What a difference a species makes: a meta-analysis of dreissenid mussel impacts on freshwater ecosystems. *Ecological Monographs* 80:179-196.

Holle, B. V. and D. Simberloff. 2005. Ecological resistance to biological invasion overwhelmed by propagule pressure. *Ecology* 86:3212-3218.

Kolar, C. S. and D.M. Lodge. 2002. Ecological predictions and risk assessment for alien fishes in North America. *Science* 298:1233-1236.

Langkilde, T. 2009. Invasive fire ants alter behavior and morphological of native lizards. *Ecology* 90:208-217.

Peterson, A. T. 2003. Predicting the geography of species' invasions via ecological niche modeling. *The Quarterly Review of Biology* 78:419-433.

Pimentel, D. R. Zuniga and D. Morrison. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics* 52:273-288.

Simberloff, D. and L. Gibbons. 2004. Now you see them, now you don't!–population crashes of established introduced species. *Biological Invasions* 6:161-172