

BIOL/EVPP 318: Conservation Biology

Spring 2026

Tuesdays and Thursdays 1:30-2:45 pm

Innovation Hall Room 137 (In-person)

3 Credits

Instructor: Dr. Emily E. Conway

Office: 3048 David King Hall

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Office Hours: in-person or virtual by appointment

Course Description:

The loss of biological diversity is now one of the most rapid forms of environmental change in the modern era. This course covers the causes and consequences of biodiversity loss and discusses approaches for overcoming these threats in ways that balance the needs of people and nature. The class begins by describing the foundations of the field of conservation biology and how scientists often conceptualize, measure, and map patterns of biodiversity. Additionally, we will also cover how biodiversity drives ecosystem processes and the threats to biodiversity, while the final portion of the course will focus on approaches, models, tools, and techniques that are used to conserve biological diversity. This interactive class emphasizes student involvement and participation. Although there will be regular lectures by the instructor and guest speakers, the course will regularly include student-led in-class discussions of foundational and timely scientific literature.

Learning Outcomes:

These learning outcomes are designed to help students master the skills needed to obtain and be successful in a job working as a conservation biologist or related position in a government agency, non-profit organization, academia, or other related industry. By the end of this course students will:

1. Describe and discuss the foundations of the field of conservation biology and how the field has evolved
2. Identify and compare the biological and social factors that control biodiversity, as well as the modern drivers of biodiversity change.

3. Assemble information and approaches from a variety of disciplines in the natural and social sciences to develop effective conservation planning.
4. Learn how to combine information and approaches from a variety of disciplines in the natural and social sciences to develop effective conservation planning.
5. Read, critically evaluate and lead discussions of peer-reviewed literature so that one can keep abreast of emerging problems, new techniques, and modern controversies that will form the foundation for extended learning throughout one's career.

Assigned and Optional Readings:

Course materials include articles from the primary literature and occasionally from other media sources. All readings will be posted on Canvas.

Textbook (optional):

Conservation Biology: Foundations, Concepts, Applications 3rd edition by Fred Van Dyke and Rachel L. Lamb. Springer, 2020

Link (use GMU login to access): <https://link-springer-com.mutex.gmu.edu/book/10.1007/978-3-030-39534-6>

Course Structure:

Lectures: Each week lectures will center on the topics outlined in the course schedule. The **lectures will be the main learning content of the course**, and I will endeavor to post the lecture slides prior to the start of each class. However, please note that this may not always happen, and the portions of the lecture slides may be missing information that can be filled in during lecture. **Attendance is required** and will count towards your final grade. However, if you are unable to attend a lecture, or if you need accommodations, please contact me as soon as possible.

Discussions: Each week there will be **at least one required reading** posted as well as additional supplementary readings if you would like to explore the discussion topic more. Readings will pertain to concepts that we will be covering during the lectures each week and will help to both build knowledge on the selected topic(s) and to help build proficiency with reading and understanding of primary literature. Prior to the paper discussion, all students will be expected to **read the assigned**

paper(s), complete the **reading quiz on Canvas** prior to class, and **post at least one discussion question** on Canvas prior to class. Discussions will take place during the second half of the class on Thursdays and should last 30-40 minutes. Group discussions should be centered on 1) a review major points of the paper, 2) highlights of any novel methods/results/conclusions, 3) relating the paper to the topics covered previously in the course or to your own knowledge, and 4) the discussion of at least two (2) of the paper discussion questions submitted by your classmates for that week's paper. As a group, you will work to complete a paper discussion worksheet that must include which discussion questions were selected by your group and a summary of the conversation your group had about those questions. **One (1) member of your group will turn in the discussion worksheet on Canvas** by the end of class or no later than the end of that day.

Discussion Questions: Prior to in-class discussions of required readings, students must complete must submit at least one (1) discussion question to the discussion board on the course Canvas page. Discussion questions should pertain to novel methods/results/conclusions that are unfamiliar or unclear or any questions or objections you have with the methods/results/conclusion.

Discussion Quizzes: Prior to in-class discussions of required readings, students must complete a reading quiz posted on the course Canvas page. These quizzes will serve to prepare everyone for the in-class discussion and to re-iterate key points from the required readings.

Midterm and Final Exam: There will be **one midterm exam and a final exam**. The exams will all be **in person and open book**, but each must be completed independently. Exam questions may be pulled from all class materials including lectures, assigned readings, and discussions. The questions on each exam will include material covered in the course up to the previous class period (i.e., the final exam is not comprehensive, but may require you to apply concepts from earlier in the course). Exam questions are not designed to trick you but provide you with the opportunity to demonstrate your learning.

Late Work Policy

There will be a 24-hour grace period on all assignment due dates. If assignments are submitted 2-7 days late, there will be a 25% reduction in points earned. If assignments are submitted more than 7 days late, there will be a 50% reduction in points earned. Please try your best to submit all assignments on or before the due date to avoid penalty but turning in your work late is better than not turning it in at all.

If you need an extension for any assignment, you must contact me at least 24 hours in advance of the due date to request one.

Grading:

Points:

Attendance	140 points (5 points/class, 28 class meetings)
Discussion Worksheets	195 points (15 points/discussion, 13 paper discussions)
Discussion Questions	65 points (5 points/discussion, 13 paper discussions)
Discussion Quizzes	125 points (10 points/discussion, 13 paper discussions)
Midterm Exam	100 points
Final Exam	200 points

Total **685 points**

Grading Policies: Grades will be awarded using the following grade cut-offs: 100-98 = A+; 98-93 = A; 92-90 = A-; 89-87 = B+; 86-83 = B; 82-79 = B-; 78-77 = C+; 76-70 = C; 69-60 = D; ≤ 59 = F.

Course Schedule:

Week	Date	Lecture Topic	Required Readings	Exercise (Due Date)
1	Tuesday 1/20	Introduction to course		
1	Thursday 1/22	Overview and History of Conservation Biology Paper Discussion	Fonseca, C. R., Paterno, G. B., Guadagnin, D. L., Venticinque, E. M., Overbeck, G. E., Ganade, G., ... & Weisser, W. W. (2021). Conservation biology: four decades of problem-and solution-based research. <i>Perspectives in Ecology and Conservation</i> , 19(2), 121-130. Kareiva, P., & Marvier, M. (2012). What is conservation	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class

			science?. <i>BioScience</i> , 62(11), 962-969. Soulé, M. E. (1985). What is conservation biology?. <i>BioScience</i> , 35(11), 727-734.	
2	Tuesday 1/27	Concept of a Species		
2	Thursday 1/29	Life History and Species Interactions Paper Discussion	Stevenson, E. A., Lucas, S., McGowan, P. J., Smallegange, I. M., & Mair, L. (2025). To What Extent Can Life History Strategies Inform Reptile Conservation Planning?. <i>Ecology and Evolution</i> , 15(6), e71488.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
3	Tuesday 2/03	Biodiversity concepts and measurements		
3	Thursday 2/05	Global patterns and drivers of diversity Paper Discussion	Gaston, K. J. (2000). Global patterns in biodiversity. <i>Nature</i> , 405(6783), 220-227. Oliveira, B. F., & Scheffers, B. R. (2019). Vertical stratification influences global patterns of biodiversity. <i>Ecography</i> , 42(2), 249-249.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
Part 2: Importance of Biodiversity				
4	Tuesday 2/10	Ecosystem functions and services – an overview		
4	Thursday 2/12	Biodiversity and ecosystem functions and services	Mitchell, M. G., Schuster, R., Jacob, A. L., Hanna, D. E., Dallaire, C. O., Raudsepp-Hearne, C., ... & Chan, K. M. (2021). Identifying key ecosystem service providing areas to inform national-scale	Discussion Quiz and Questions due prior to lecture

		Paper Discussion	conservation planning. <i>Environmental Research Letters</i> , 16(1), 014038.	Discussion Worksheet submitted by end of class
5	Tuesday 2/17	Biodiversity modelling		
5	Thursday 2/19	Biodiversity modelling Paper Discussion	Pollock, L. J., O'connor, L. M., Mokany, K., Rosauer, D. F., Talluto, M. V., & Thuiller, W. (2020). Protecting biodiversity (in all its complexity): new models and methods. <i>Trends in Ecology & Evolution</i> , 35(12), 1119-1128.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
Part 3: Threats to Biodiversity				
6	Tuesday 2/24	Habitat loss, degradation, and fragmentation		
6	Thursday 2/26	Invasion Paper Discussion	Teixeira, C., Nunes, G. L., Trevelin, L. C., Silva, D. P., & Prudente, A. L. D. C. (2025). Assessing Connectivity Thresholds Under Habitat Loss Scenarios for Threatened Amphibians and Squamate Reptiles in the Eastern Brazilian Amazon. <i>Ecology and Evolution</i> , 15(7), e71741.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
7	Tuesday 3/03	Overharvesting		
7	Thursday 3/05	Climate Change Paper Discussion	Jones, K. R., Watson, J. E., Possingham, H. P., & Klein, C. J. (2016). Incorporating climate change into spatial conservation prioritisation: A review. <i>Biological Conservation</i> , 194, 121-130.	Discussion Quiz and Questions due prior to lecture

				Discussion Worksheet submitted by end of class
8	3/09- 3/13	Spring Break: Classes Do Not Meet		
9	Tuesday 3/17	Extinction		
9	Thursday 3/19	Mid-Term Exam		
Part 4: Approaches to Conservation				
10	Tuesday 3/24	Legal foundation of conservation		
10	Thursday 3/26	Conservation of genetic diversity Paper Discussion	DeWoody, J. A., Harder, A. M., Mathur, S., & Willoughby, J. R. (2021). The long-standing significance of genetic diversity in conservation. <i>Molecular ecology</i> , 30(17), 4147-4154.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
11	Tuesday 3/31	Conservation of populations		
11	Thursday 4/02	Conservation of communities and ecosystems Paper Discussion	Obura, D. O., Aeby, G., Amornthammarong, N., Appeltans, W., Bax, N., Bishop, J., ... & Wongbusarakum, S. (2019). Coral reef monitoring, reef assessment technologies, and ecosystem-based management. <i>Frontiers in Marine Science</i> , 6, 580.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class

12	Tuesday 4/07	In situ vs. Ex situ conservation		
12	Thursday 4/09	Managing conservation reserves across the landscape Paper Discussion	Mestanza-Ramón, C., Henkanathhegedara, S. M., Vásconez Duchicela, P., Vargas Tierras, Y., Sánchez Capa, M., Constante Mejía, D., ... & Mestanza Ramón, P. (2020). In- situ and ex-situ biodiversity conservation in Ecuador: A review of policies, actions and challenges. <i>Diversity</i> , 12 (8), 315.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
13	Tuesday 4/14	Conservation in aquatic systems		
13	Thursday 4/16	Conservation in urban environments Paper Discussion	Lepczyk, C. A., Aronson, M. F., Evans, K. L., Goddard, M. A., Lerman, S. B., & MacIvor, J. S. (2017). Biodiversity in the city: fundamental questions for understanding the ecology of urban green spaces for biodiversity conservation. <i>BioScience</i> , 67(9), 799-807.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
14	Tuesday 4/21	Restoration as a tool of conservation		
14	Thursday 4/23	Natural history collections and herbaria as tools for conservation Paper Discussion	Nualart, N., Ibáñez, N., Soriano, I., & López-Pujol, J. (2017). Assessing the relevance of herbarium collections as tools for conservation biology. <i>The Botanical Review</i> , 83, 303-325.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class

15	Tuesday 4/28	International Conservation		
15	Thursday 4/30	International Conservation Paper Discussion	Mason, N., Ward, M., Watson, J. E., Venter, O., & Runting, R. K. (2020). Global opportunities and challenges for transboundary conservation. <i>Nature ecology & evolution</i>, 4(5), 694-701. Sandbrook, C., Fisher, J. A., Holmes, G., Luque-Lora, R., & Keane, A. (2019). The global conservation movement is diverse but not divided. <i>Nature Sustainability</i>, 2(4), 316-323.	Discussion Quiz and Questions due prior to lecture Discussion Worksheet submitted by end of class
Final Exam Tuesday 05/16 1:30 – 4:15 pm				

Additional GMU Policies:

Academic Standards

Academic Standards exist to promote authentic scholarship, support the institution's goal of maintaining high standards of academic excellence, and encourage continued ethical behavior of faculty and students to cultivate an educational community which values integrity and produces graduates who carry this commitment forward into professional practice.

As members of the George Mason University community, we are committed to fostering an environment of trust, respect, and scholarly excellence. Our academic standards are the foundation of this commitment, guiding our behavior and interactions within this academic community. The practices for implementing these standards adapt to modern practices, disciplinary contexts, and technological advancements. Our standards are embodied in our courses, policies, and scholarship, and are upheld in the following principles:

- **Honesty:** Providing accurate information in all academic endeavors, including communications, assignments, and examinations.
- **Acknowledgement:** Giving proper credit for all contributions to one's work. This involves the use of accurate citations and references for any ideas, words, or materials created by others in the style appropriate to the discipline. It also includes

acknowledging shared authorship in group projects, co-authored pieces, and project reports.

- **Uniqueness of Work:** Ensuring that all submitted work is the result of one's own effort and is original, including free from self-plagiarism. This principle extends to written assignments, code, presentations, exams, and all other forms of academic work.

Violations of these standards—including but not limited to plagiarism, fabrication, and cheating—are taken seriously and will be addressed in accordance with university policies. The process for reporting, investigating, and adjudicating violations is [outlined in the university's procedures](#). Consequences of violations may include academic sanctions, disciplinary actions, and other measures necessary to uphold the integrity of our academic community.

The principles outlined in these academic standards reflect our collective commitment to upholding the highest standards of honesty, acknowledgement, and uniqueness of work. By adhering to these principles, we ensure the continued excellence and integrity of George Mason University's academic community.

Student responsibility: Students are responsible for understanding how these general expectations regarding academic standards apply to each course, assignment, or exam they participate in; students should ask their instructor for clarification on any aspect that is not clear to them.

Accommodations for Students with Disabilities

Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit <https://ds.gmu.edu/> for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu. Phone: (703) 993-2474.

Student responsibility: Students are responsible for registering with Disability Services and communicating about their approved accommodations with their instructor *in advance* of any relevant class meeting, assignment, or exam.

FERPA and Use of GMU Email Addresses for Course Communication

The [Family Educational Rights and Privacy Act \(FERPA\)](#) governs the disclosure of [education records for eligible students](#) and is an essential aspect of any course. **Students must use their GMU email account** to receive important University information, including communications related to this class. Instructors will not respond to messages sent from or send messages regarding course content to a non-GMU email address.

Student responsibility: Students are responsible for checking their GMU email regularly for course-related information, and/or ensuring that GMU email messages are forwarded to an account they do check.

Title IX Resources and Required Reporting

As a part of George Mason University's commitment to providing a safe and non-discriminatory learning, living, and working environment for all members of the University community, the University does not discriminate on the basis of sex or gender in any of its education or employment programs and activities. Accordingly, **all non-confidential employees, including your faculty member, have a legal requirement to report to the Title IX Coordinator, all relevant details obtained directly or indirectly about any incident of Prohibited Conduct** (such as sexual harassment, sexual assault, gender-based stalking, dating/domestic violence). Upon notifying the Title IX Coordinator of possible Prohibited Conduct, the Title IX Coordinator will assess the report and determine if outreach is required. If outreach is required, the individual the report is about (the "Complainant") will receive a communication, likely in the form of an email, offering that person the option to meet with a representative of the Title IX office.

For more information about non-confidential employees, resources, and Prohibited Conduct, please see [University Policy 1202: Sexual and Gender-Based Misconduct and Other Forms of Interpersonal Violence](#). Questions regarding Title IX can be directed to the Title IX Coordinator via email to TitleIX@gmu.edu, by phone at 703-993-8730, or in person on the Fairfax campus in Aquia 373.

*** Please note, as a faculty member I am a mandatory reporter and must report all disclosures ***

Student opportunity: If you prefer to speak to someone **confidentially**, please contact one of Mason's confidential employees in Student Support and Advocacy ([SSAC](#)),

Counseling and Psychological Services ([CAPS](#)), Student Health Services ([SHS](#)), and/or the [Office of the University Ombudsperson](#).