Invasive Species Management

EVPP 692 CRN 83029 - 1 credit

EVPP 991 CRN 84678 – 2 credits

Fall Semester 2022

August 8, 2022 edition

INSTRUCTOR: J. Michelle Ryan, PhD
Email: jryan10@gmu.edu

CLASSROOM: Enterprise Hall 174

CLASS MEETINGS: Mondays, 4:30 PM to 6:20 PM

OFFICE HOURS: By appointment

COURSE DESCRIPTION:

The course will introduce students to different aspects of invasive species management mostly centered within the United States, though examples from other parts of the world will be highlighted and discussed. Topics will include exploring the foundations of invasive species management federal policies, reviewing major classes of invasive species and transport pathways, discussing risk mitigation strategies employed for invasive species management, examining tools and techniques used in the field, reflecting upon the impacts of climate change with respect to invasive species, and delving into examples of outreach and communications strategies. Throughout the semester, there will be guest speakers from municipal, state, and federal agencies as well as not-for-profit organizations to provide insights into current invasive species management practices. The class is meant for students with either a natural or social science background interested in obtaining expertise in invasive species management topics.

REQUIRED READINGS:

- The reading list for the seminar class will consist of journal articles made available in Adobe PDF format (see Schedule section) and accessed through the course's Blackboard site.

COURSE STRUCTURE: The course will consist of topical lectures/discussions, guest speaker presentations, and student-led presentations.

- Topical discussions will be based on lectures and readings each week and discussion based on the readings.
    - Come prepared with questions for any guest speakers scheduled throughout the semester.
- Student Assignments 1A and 1B – Invasive Species Showcases:
    - The student will showcase two invasive species (two presentations, which each

presentation showcasing one invasive species). The student will prepare two organized presentations of approximately 20-25 minutes each addressing these topics, and then take questions from the class following the two presentations:

- Identification of the selected invasive species
  - Non-U.S. examples are permitted
- Which agency and/or governmental body labeled the species as invasives
- Geographic extent of the invasive species
- Impacts of the invasive species (ecological, economic)
- Key stakeholders in the mitigation and/or management of the invasive species

- The student will also list all citations used on the last slide of the presentations and provide final copy of each presentation to the professor via email prior to the start of the class.
- Scheduling of the two presentations will be discussed in the first class session.

- Assignment 2 Stakeholder forum where invasive species management stakeholders are represented by students, debate, development of plan of action. A separate sheet will be posted to Blackboard with the details of the assignment.
- Assignment for EVPP 991 students only: A 5,000-word research document to support the Student Assignment 1A and 1B, complete with all citations consistent within their field of study. The written assignment is due prior to the final class of the semester (November 28, 2022) via email to the professor.

COURSE GRADING: Grades will be based on the instructor's assessment of active and meaningful class participation and student assignments. Weighting of these activities will be as follows:

For EVPP 692 students (1 credit):

Student assignment 1A Invasive Species Showcase	15%
Student assignment 1B Invasive Species Showcase	15%
Student assignment 2 Stakeholder Forum	25%
Class participation	45%
TOTAL	100%

For EVPP 991 students (2 credits):

Student assignment 1A Invasive Species Showcase	15%
Student assignment 1B Invasive Species Showcase	15%
Student assignment 2 Stakeholder Forum	20%
Written Assignment	10%
Class participation	40%
TOTAL	100%

Final scores will be calculated based on the percentage grade earned on each of the course activities listed above, multiplied by the weighting listed for each activity. Letter grades will be assigned based on the final course score as follows:

- A+ = 97-100%
- A = 93 - 96%
- A- = 90 - 92%
- B+ = 87 - 89%
- B = 83 - 86%
- B- = 80 - 82%
- C = 70 - 79%
- F = 0 - 69%

ACADEMIC INTEGRITY: GMU students, faculty and staff are bound by the GMU Honor Code. Adherence to the GMU Honor Code is expected of all students, specifically:

Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

In all assignments and communications, plagiarism will not be tolerated. This applies equally to oral and written communications in the context of any evaluated (graded) course assignments. As stated in the Honor Code, infractions may result in invalidated credit for dishonorable work and lowered grade, including failure from the class, suspension or dismissal. Inquiries for clarification from the professor are welcome. For more information see the complete Honor Code in the university catalog.

DISABILITY ACCOMMODATIONS: 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 http://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.

DIGITAL COMMUNICATION: Students must use their GMU email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.

DIVERSITY STATEMENT: George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth. An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

Schedule Fall Semester 2022

Date	Class	Lecture Topic from Dr. Ryan	Guest Speakers will be lecturing on their area of expertise	Readings
Aug 22	1	Course Overview / Introduction/Definitions/Historical Context	N/A	van Kleunen, Mark, Oliver Bossdorf, and Wayne Dawson. "The Ecology and Evolution of Alien Plants." Annual review of ecology, evolution, and systematics 49.1 (2018): 25–47. Russell, James C, and Christopher N Kaiser-Bunbury. "Consequences of Multispecies Introductions on Island Ecosystems." Annual review of ecology, evolution, and systematics 50.1 (2019): 169–190.
Aug 29	2	Foundation/Actors	TBA	Herrick, Charles N. "A Review of the U.S. Invasive Species Policy Mix: Questioning the Prospect of an Integrated Regime." Environmental policy and governance 29.4 (2019): 262–278.
Sept 5	-	Labor Day Holiday	No Class	No Class
Sept 12	3	Plants overview	Terri Hogan, Invasive Plant Program Manager, Landscape Restoration & Adaptation, Biological Resources Division, Natural Resource Stewardship and Science Fort Collins, CO (via Zoom)	Rapp, Valerie. Invasive Plants in 21st Century Landscapes. Portland, OR: U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, 2005. Beaury, Evelyn M. "Plant Regulatory Lists in the United States Are Reactive and Inconsistent." The Journal of Applied Ecology. 58.9 (2021): 1957–1966. Student assignment 1A or 1B Invasive Species Showcase

Date	Class	Lecture Topic from Dr. Ryan	Guest Speakers will be lecturing on their area of expertise	Readings
Sept 19	4	Aquatic	John Odenkirk, Fisheries Biologist, Virginia Department of Wildlife Resources	Ruiz, Gregory et al. "Marine Crustacean Invasions in North America: A Synthesis of Historical Records and Documented Impacts." In the Wrong Place - Alien Marine Crustaceans: Distribution, Biology and Impacts. Dordrecht: Springer Netherlands, 2011. 215–250. Hoff and Odenkirk. "Management Implications from a Stock-Recruit Model for Northern Snakehead in Virginia Waters of the Tidal Potomac River." American Fisheries Society. 89 (2019) 1-10. Student assignment 1A or 1B Invasive Species Showcase
Sept 26	5	Terrestrial	Patricia Pearl Greenberg, Ecologist and Invasive Management Area (IMA) Program Manager, Natural Resource Branch, Fairfax County Park Authority; Sara Holtz and Greg Sykes, Fairfax County Park Authority IMA Site leads	Review in detail the contents of the Fairfax County IMA page located at https://www.fairfaxcounty.gov/parks/invasive-management-area Student assignment 1A or 1B Invasive Species Showcase
Oct 3	6	Terrestrial/Insects	Clay Morris, Environmental Services Section Chief, Prince William County Public Works-Environmental Services	Beukeboom, Leo W. "What Makes an Insect Invasive?: An Introduction." Entomologia experimentalis et applicata 166.3 (2018): 149–150. Bradshaw, Corey J A et al. "Massive yet Grossly Underestimated Global Costs of Invasive Insects." Nature communications 7.1 (2016): 12986–12986. Student assignment 1A or 1B Invasive Species Showcase
Oct 10	-	Fall Break	No class	No class
Oct 17	7	Mitigations/Risk Assessments	TBA	National Invasive Species Management Council 2019 white paper, "The interface between invasive species and the increased incidence of tickborne diseases, and the implications for federal land managers." Student assignment 1A or 1B Invasive Species Showcase

Date	Class	Lecture Topic from Dr. Ryan	Guest Speakers will be lecturing on their area of expertise	Readings
Oct 24	8	Mitigation: Aquatic	Dr. Nancy Rybicki.PhD Aquatic Plant Ecologist, emeritus George Mason University (GMU Affiliate Professor), and Dr. Ian Pfingsten, Botanist, Wetland and Aquatic Research Center, USGS, Gainesville, FL (TBA Zoom and/or in-person)	Readings TBA Student assignment 1A or 1B Invasive Species Showcase
Oct 31	9	Climate Change	TBA	Beaury, Evelyn M et al. "Incorporating Climate Change into Invasive Species Management: Insights from Managers." Biological invasions 22.2 (2019): 233–252. Student assignment 1A or 1B Invasive Species Showcase
Nov 7	10	Management Framework (Note: Daylight Savings Time ends November 6.)	Kurt P. Kowalski, PhD U.S. Geological Survey Great Lakes Science Center Ann Arbor, MI (via Zoom)	Holt, Jodie, "Management of invasive terrestrial plants" in Invasive Species Management: A Handbook of Principles and Techniques, edited by Mick N. Clout, and Peter A. Williams, Oxford University Press, 2009. García-Díaz, Pablo et al. "Management Policies for Invasive Alien Species: Addressing the Impacts Rather Than the Species." Bioscience 71.2 (2021): 174–185. Student assignment 1A or 1B Invasive Species Showcase
Nov 14	11	Tools	Wesley A. Bickford, PhD Biologist U.S. Geological Survey Great Lakes Science Center Ann Arbor, MI (via Zoom)	Meyerson, L.A. et al. (2022). Moving Toward Global Strategies for Managing Invasive Alien Species. In: Clements, D.R., Upadhyaya, M.K., Joshi, S., Shrestha, A. (eds) Global Plant Invasions. Springer, Cham. Student assignment 1A or 1B Invasive Species Showcase
Nov 21	12	Outreach and Communications	Alli Candelmo, PhD Conservation Science Manager Reef Environmental Education Foundation (REEF) (via Zoom)	Simnitt, Skyler et al. "Using Markets to Control Invasive Species: Lionfish in the US Virgin Islands." Marine resource economics 35.4 (2020): 319–341. Student assignment 1A or 1B Invasive Species Showcase

Date	Class	Lecture Topic from Dr. Ryan	Guest Speakers will be lecturing on their area of expertise	Readings
Nov 28	13	Wrap up	N/A	Preparatory materials for the invasive species management mock session. Session will consist of a student-led mock meeting of stakeholders representing groups such as government, industry, neighbors, and advocacy groups, drawing upon the information derived from prior lectures and guest speakers' presentations. Details will be posted to Blackboard in advance of the session. EVPP 991 students only: Paper assignment due by start of class