The Challenge of Biodiversity
EVPP 619 - 3 credits
Spring, 2022 Course Syllabus

Class Meets: Mondays, from 4:30 to 7:10 pm, online, 1/24/2022 – 5/18/2022

Instructor: Dr. V. Alaric (Al) Sample vsample@gmu.edu **202 744-6139**
Office hours by appointment, normally Mondays before class**,** but if not possible, other times and places can be arranged to accommodate students' schedules.

Teaching Assistant: Cheryl Rash Jones **crashjon@gmu.edu** (or RashJonesC@gmail.com)
Cell phone: 571 205 3654 (call or text, but let me know who you are)
Office hours by appointment. Flexible days/hours.

SAFE RETURN TO CAMPUS: Although our course is online, you should be aware of this:

All students taking courses with a face-to-face component are required to follow the public health and safety precautions and procedures outlined on GMU's **Safe Return to Campus webpage** (https://www2.gmu.edu/safe-return-campus). All students in face-to-face and hybrid courses must **also complete the Mason COVID Health Check daily**, seven days a week. Students using this system will receive a Green, Yellow, or Red response. **Only students who receive a "Green" notification are permitted to attend courses with a face-to-face component**. If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. **Faculty may ask you** to show them that you have received a green response and are thereby permitted to be in class.

COURSE INFORMATION

Blackboard (Bb) Course Website:

To minimize possible problems, please use a browser supported by Blackboard:
Chrome: 87+ Firefox: 78+ Safari: 13+ Edge: 87+

MacOS 10.13+ is required to update to a supported version of Safari. To fix a 404 error message in Microsoft Edge, go to Edge Settings > Downloads > unselect "Open Offices files in the browser."

To access the course, go to https://mymasonportal.gmu.edu/webapps/portal/frameset.jsp, or from www.gmu.edu, click on "students" then "MyMason". Log in using your user ID and Patriot Pass password. Click on the courses tab and select EVPP 619-001 from the list. Please let your TA know if you have any problems accessing or using this site.

All course materials except textbooks will be posted to Bb. Assignments should be turned in through Bb as well.

Department of Environmental Science & Policy
Environmental Science & Policy Department Office telephone: 703-993-1043
Environmental Science & Policy Department website: http://esp.gmu.edu

If you are not on the listserve to receive Environmental Science & Policy Department emails, contact Anne Reynolds at areyno14@gmu.edu

Objective of the Course:
The principal objective is to enrich students' understanding of solving problems in conservation and conservation biology. Such problems require sound science but also include considerations that go beyond science; in lectures, readings, presentations, and papers the class will work with real and sometimes very current problems. This course is intended to give students the necessary background to pursue advanced studies and careers that involve both international and domestic issues in conservation and conservation biology. Major themes include finding solutions, the value of conflicting perspectives, and the importance of learning to engage others effectively.

Course Prerequisites: Graduate Standing & 6 credit hours of graduate course work or permission of instructor.

Course Overview and Content:
All students will choose a topic (subject to approval of instructor) relating to the challenge of biodiversity conservation. Students will prepare a research paper (or alternative assignment) on their topic and give a presentation.

This course emphasizes effective communication, research skills, and critical thinking, and provides opportunities to further your skills. Active discussions, presentations, guest speakers, assignments, a field trip, and your research paper (or alternative assignment) are the assessments used in this course. Assigned reading for this course includes portions of two textbooks, as well as journal and newspaper articles. One textbook for this class is available for download at no charge (see below.) The other textbook is available through Yale University Press and/or the campus bookstore. Other readings will be assigned to augment class discussion; typically, pdf files will be posted on Blackboard.

Speakers and class exercises were chosen to represent an extensive variety of challenges and activities in conservation and conservation science; most are multi-factorial in nature. All are intended to develop students' abilities to recognize and analyze issues, to devise solutions, and to provide a wide spectrum of perspectives of value to a conservation career.

REQUIRED TEXTBOOKS

Conservation Biology for All. 2010. Sodhi, N.S. & P. R. Ehrlich, Editors. Oxford University Press 358 pp. Available at: http://www.mongabay.com/conservation-biology-for-all.html

The Future of Nature: Documents of Global Change. 2013**.** Edited by Libby Robin, Sverker Sörlin, and Paul Warde. Yale University Press, New Haven, CT. ISBN: 9780300184617. Available at: http://yalepress.yale.edu/yupbooks or http://yalepress.yale.edu/yupbooks/SearchResultsTMM.asp?selType=Title&txtCriteria=the future of nature

American Psychological Association. (2019). *Publication manual of the American Psychological Association* (7th ed.). Washington, DC.

GENERAL POLICIES AND RESOURCES

Attendance: You are expected to attend every class session and to be there on time. If you must miss a class, please let the instructor and teaching assistant know ahead of time, if possible. Absences may affect your participation grade.

Email: GMU requires students to use the GMU email system. You can set up this email to forward to a different email address. Your GMU email address will be used for all contact regarding this course. See http://gmu.edu

Networking: Recognizing the value of colleague relationships, Prof. Lovejoy invited students to dinner after class each week. We continue this tradition with remote learning, as we invite you to grab a bite and chat informally after class. Guest speakers are also invited – a valuable opportunity to connect with them in a more informal setting. This is not required and will not affect your grade, but building these bonds can benefit your future success.

Academic Integrity:
GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. Academic Integrity is taken very seriously; violations are treated gravely and will be reported directly to the Office of Academic Integrity, who will investigate, and if a violation is substantiated, will impose sanctions, which can be severe. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you yourself will perform that task, and do your own original work. When you rely on someone else's work in any aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification. See http://catalog.gmu.edu/policies/honor-code-system/

University Policies
The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies

Office of Disability Services
If you are a student with a disability and you need academic accommodations, please contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. http://ods.gmu.edu

Other Useful Campus Resources:
Writing Center: Lab for Writing & Communication, Johnson Center 227E; (703) 993-1200; http://writingcenter.gmu.edu
University Libraries "Ask a Librarian" http://library.gmu.edu/mudge/IM/IMRef.html

Counseling And Psychological Services (CAPS):
(703) 993-2380; http://caps.gmu.edu

Cell phones:
As a courtesy to your classmates, professor and guest speakers, please turn your cell phone ringer off during class. If you are experiencing a medical or family situation where you need to receive an incoming call, please let us know, and feel free to exit the class to receive your call.

Inclement Weather and Class Cancelation:
We will still plan to have class virtually. Any additional information will be provided if necessary.
GMU posts closings on its website (www.gmu.edu.) You can receive notification from Mason Alerts via email or text to a cell phone.

GRADING

Grading Scale

A+	98 - 100	B+	88 – 89	C+	78 - 79	F	<70
A	93 – 97	B	83 – 87	C	73 - 77		
A-	90 – 92	B-	80 - 82	C-	70 - 72		

See https://catalog.gmu.edu/policies/academic/grading/#ap3-2-1

Basis Of Grading - Overview (100 Points Possible)* [could change very slightly]

Class participation		**13**
Class discussion of readings & discussion leading	8	
Student presentation evaluations	3	
Assignments		**29**
Experience Reflections (8 @ 2 points each)	16	
Solutions article discussion leading (10 min) and reflection	5	
Team project & presentation (Buffett Awards – 30 minutes/team)	10	
Midterm Exam		**15**
Case Study or Alternative Assignment		**36**
Case Study/Alt Assignment title, description/abstract, outline, & preliminary references	3	
Case Study or Alternative Assignment Presentation (includes handout)	10	
CS/AA paper peer review	3	
Case Study or Alternative Assignment Paper	20	
Final quiz/last questions		**7**
TOTAL POSSIBLE COURSE POINTS		**100**

Basis of Grading – Details

Following directions for all graded materials is expected. If in doubt, please consult the syllabus and Blackboard. If you are still unclear about something, please ask your instructors. Clear communication, including correct spelling, grammar, and punctuation, is expected in all written assignments. You should not expect full credit if there are mistakes in usage. Thorough proofreading is expected.

Most written assignments have a maximum word count. We hope you will write both deeply and concisely. Full credit will not be given if you go over the maximum word count, if you are significantly under, or if you merely pad it.

Class participation
Students are expected to attend class, to engage in and lead class discussions, and participate fully and meaningfully in the group project. Emphasis is placed on effective communication; class discussions and question/answer sessions after presentations provide avenues to demonstrate and develop your critical thinking and communication skills.

Assignments
Assignments include discussion leading, presentations, research, team project, peer review, and written reflections. Assessment of assignments is based on content, adherence to parameters of assignment (following instructions, completeness, observance of deadline etc.) as well as spelling, grammar, and punctuation. Your writing reflects not only on yourself, but on your university, your organization, and our profession, and should demonstrate professionalism in quality of research, content, and usage.

Reflections on a presentation or activity are intended to engage students in higher order thinking skills by analyzing, reconsidering, questioning and relating the content within a broader context of student knowledge and experience. Reflections should not be just a summary or a description, but should involve your own thinking about the subject. You should not expect full credit unless you demonstrate an interaction with your own thoughts and outlook. All reflections are due by 11:59 pm on the Friday following the related class.

Midterm Exam
An essay format, take-home midterm exam will be distributed. It will be due one week later to the Assignments tab on Blackboard. Your responses will be graded on factual content and understanding expressed, depth of personal reflection, following directions, and quality of writing.

Case study or Alternative Assignment

Case study (CS): Each student will identify a challenge in conservation biology/conservation and research the factors and drivers creating the problem, strategies and actions taken to address the problem, key players, and potential solutions for the problem.

Alternative assignment (AA): There is an option to complete an alternative assignment to fulfill this requirement. This option offers you an opportunity to be creative and design/implement a project that relates to biodiversity conservation, as you apply your course learning to a project related to your interests. The time, effort, and rigor put in should be comparable to a standard case study assignment. You should discuss your ideas with your instructors and seek approval for your project design. The opportunity to complete an alternative assignment project will be discussed further during the first class.

Regardless of the option chosen, there are incremental assignments, and two end products for this semester-long assignment: a presentation, and a paper.

Presentations

All students will give an oral, timed presentation on their case study/AA (time limit specified in Blackboard), followed by a class discussion and question/answer period. The presentations should be of the type and quality for submission at a professional, scientific, or academic conference or symposium. All presenters should **prepare a "handout" with an abstract, outline, and references to be posted to the Blackboard Discussion Board for access by your classmates, the instructor, and teaching assistant.** (A bare minimum number of references is 15 for MS, 25 for PhD, with the majority and most significant from peer-reviewed journals. If you need help, please contact a GMU librarian either on site or online to learn how to search the GMU online library & identify which sources are peer-reviewed.) References should be listed in APA 7th Edition format.

Please submit your PowerPoint slides to Bb Assignments, and post your handout (with your presentation abstract, outline, and references) before noon on the day of your presentation.

Criteria for grading the presentations include content, research quality, organization, analysis, visual clarity, and presentation style. Correct spelling and grammar usage **do** count. You are in graduate school and are expected to express yourself in a professional way. **Proofread carefully.**

Critique of presentations

Using a basic form (provided on Blackboard for you to download, fill out digitally, and submit), students will critique each other's presentations. These critiques will be collected and reviewed by the instructor. Names will be removed and the critiques forwarded to the presenters for constructive feedback. These evaluations carry course credit, and we expect you to offer thoughtful and genuine feedback to your classmates.

Paper:

All students will prepare an academic paper on their selected topic. Case studies will be in the form of a traditional research paper; Alternative Assignments will be based on relevant literature in the field as background, and describe the objectives, methodology undertaken, results, analysis, future steps/directions, and lessons learned.

Formatting and citation style should follow the American Psychological Association (APA) Style, 7th edition, the standard/dominant professional style for the biological sciences. Generally speaking, formatting should be left-justified, Times New Roman 12-point font, 1-inch margins, double-spaced throughout, including abstract and references. Specified format for headings / subheadings should also be followed. Reference formatting varies by source type. The *Publication manual of the American Psychological Association,* 7th edition is required for your reference in this course and will be a valuable addition to your professional collection. **Zotero** citation software (free download at https://www.zotero.org/) is also recommended for ease in creating correct citation format.

A **Running head** should be included in the header on each page per APA guidelines.

Each paper should include an **Abstract**, on a separate page before the body of the paper. The Abstract should summarize and preview the problem, methodology, and conclusions of the paper. The Abstract should be a **maximum of 200 words.**

The **Body** of your paper should be complete, clear, and logically organized to lead a reader through an understanding of your topic. Case study papers should be a minimum of 12 pages, maximum 14. References, images, and tables are not included in the page count.

References should start a new page at the end of the body of the paper, and follow APA formatting. Generally, references should be listed in alphabetical order by first author's last name. Date (generally, year) of the publication should follow the authors' names. Please format to leave the first line hanging for each reference. Master's students are expected to have a bare minimum of 15 references, and PhD students a minimum of 25. Most references should be from peer-reviewed journals. Any reliance on others' work should be credited, including ideas, thoughts, concepts, data, images, etc. Direct quotes should be avoided or used only when necessary. All in-text citations should appear in end references, and vice versa. Please refer to the APA 7th edition style guide for specifics. Zotero reference software is recommended to organize your sources; it was developed here at GMU and is available as a free download (www.zotero.com). The library offers Zotero workshops; your TA can also help you get started.

Additional guidelines:

- References, images, and tables are not included in the page count. References should begin a new page after the body of the paper (use a page break). Images and tables may appear within the body (but are not included in the page count), or in a separate appendix after the References.
- Please number the pages (in the top right) and put your name on each page under the running head in the header.
- Please use spell and grammar check, and carefully proofread your work. Correct usage counts in your grade.
- Submit an electronic file. The electronic file is submitted to GMU plagiarism software and should be in a .doc or .docx format.

Peer review: You will review another student's paper before final submission to give constructive feedback to your classmate. This feedback can be helpful to the author as they revise and complete their paper before submitting. You will receive credit for the quality of your peer review. Check Blackboard for details.

Criteria for grading the papers include content, research, analysis, organization, and writing style, including spelling, punctuation, and grammar usage. Students are expected to produce a paper suitable for publication in a peer-reviewed journal, which includes proper references, citations, language usage, and format..

Final Quiz/Last Questions

Similar to the Midterm Exam, but shorter and lighter. This essay format, take-home quiz will be distributed during the next-to-last class, and be due by 11:59 pm on the following Saturday. It should be submitted to the Assignments tab on Blackboard. Your responses will be graded on factual content and understanding expressed, depth of personal reflection, following directions, and quality of writing.

NOTE: All writings should adhere to the basics of APA writing style and additional specifications for this course. This includes proper citation and heading format, as well as parameters described in the APA manual and above in this section. Professional writing style, including correct use of spelling and grammar, is expected. See the Grammar Tips document under the Syllabus tab on Blackboard for more information.

Late submissions may not be accepted; if accepted the grade will be reduced.
The professor reserves the right to modify the course content or syllabus

Every effort has been made to be clear and consistent, but if you notice any discrepancies internal to this syllabus or Blackboard, or between the syllabus and Blackboard, please call it to our attention so we can clarify.

Course Schedule below. Speaker series highlighted yellow. Blue highlights are likely to be updated.

Course Schedule: EVPP 619 Spring 2022

Students will be assigned to lead discussions on some readings. Please see Blackboard for assignments.

Please ignore the blue codes in parentheses on this syllabus for now.

WEEK 1: January 24: Overview, syllabus, solutions & presentation/discussion

Class discussions: Course overview; Review Syllabus; Readings; Solution article discussion; Introduce Buffett Awards

Course introduction: Al Sample; **Student self-introductions:** background, academic/career interests, course goals/objectives
Course overview and assignments: Cheryl Rash Jones: Syllabus highlights, assignments, and expectations;

Discussion for today: Watch this short video: https://www.youtube.com/watch?v=_fVv2Jt0o18 and read this syllabus plus:

1. Lovejoy, Conservation Biology 1989 (2 pp)
2. Smithsonian Magazine article about Wegner 2012 (4 pp)
3. Excerpt from *The Tao of Research*
4. Barash article: Life is Good 2014 (5 pp)
5. Ruth Patrick obituaries in NYT and WaPo (6 pp)
6. **Solution article example 1: (Hertsgaard, 2012): A quiet desert storm (6 pp)**

ASSIGNMENT: Introduce yourself on the Discussion Board, and read and respond to others.
ASSIGNMENT: Reflection 1: Why are you taking this class and what do you hope to get out of it? (Due Friday, January 28, by 11:59 pm – 250 words maximum)
ASSIGNMENT: Review Buffett Award information and think about which team you'd like to join
ASSIGNMENT: Think about your case study topic or alternative assignment.

WEEK 2: January 31: Extinctions & the Practice of Preventing Them

Invited Guest Speaker: Dr. Stuart Pimm, Doris Duke Professor of Conservation Ecology, Duke University

Class discussion: Readings; Case Study (CS)/Alternative Assignment (AA); Assign Buffett Teams; Initial Team meetings

Read for today's speaker & discussion (71 pages + Solution article)

1. Jenkins, C.N., van Houtan, K. S., Pimm, S. L., & Sexton, J. O. (2015). U.S. protected lands mismatch biodiversity priorities. Proceedings of the National Academy of Sciences (U.S.A.) 112: 5081-5086. (5 pp)
2. Li, B. V. & Pimm, S. L. (2015). China's endemic vertebrates sheltering under the protective umbrella of the giant panda. Conservation Biology 30: 329-339. (10 pp)
3. Li, B. V., & Pimm, S. L. (2020). How China expanded its protected areas to conserve biodiversity. *Current Biology*, *30*, R1331–R1360. https://doi.org/10.1016/j.cub.2020.09.025 (7pp)
4. Newmark, W. D, Jenkins, C. N., Pimm, S. L., McNeally, P. B., & Halley, J. M. (2017). Targeted habitat restoration can reduce extinction rates in fragmented forests . Proceedings of the National Academy of Sciences: 114: 9635–9640. (5 pp)
5. Pimm, S. L. & Jenkins, C. N. (2019). Connecting habitats to prevent species extinctions. American Scientist. 107(3):162-9. (8 pp)
6. Pimm, S. L., Jenkins, C. N., Abell, R., Brooks, T. M., Gittleman, J. L., Joppa, L. N., Raven, P. H., Roberts, C. M., & Sexton, J. O. (2014). The biodiversity of species and their rates of extinction, distribution, and protection. *Science 344*(6187), 987-997. (9 pp)
7. Pimm, S. L., Jenkins, C. N. and Li, B.V. (2018). How to protect half of Earth to ensure it protects sufficient biodiversity. Science Advances, 4. 2616. (6 pp)
8. Huang, R. M., Medina, W., Brooks, T. M., Butchart, S. H. M., Fitzpatrick, J. W., Hermes, C., Jenkins, C. N., Johnston, A., Lebbin, D. J., Li, B. V., Ocampo-Peñuela, N., Parr, M., Wheatley, H., Wiedenfeld, D. A., Wood, C., & Pimm, S. L. (2021). Batch-produced, GIS-informed range maps for birds based on provenanced, crowd-sourced data inform conservation assessments. *PLOS ONE, 16*(11), e0259299. https://doi.org/10.1371/journal.pone.0259299 (16 pp)
9. Pimm, S. L., Willigan, E., Kolarova, A., & Huang, R. (2021). Reconnecting nature. *Current Biology*, *31*(19), R1159–R1164. https://doi.org/10.1016/j.cub.2021.07.040 (5 pp)

ASSIGNMENT: Sign up for a Buffett Award Team. Plan to read Buffet Award Biographies for your team.
ASSIGNMENT: Reflection 2: Stuart Pimm presentation/discussion (Due Fri. February 4, by 11:59 pm)
DUE NEXT WEEK: Case study/Alternative Assignment topic due by class time next week.

WEEK 3: February 7: Conservation Biology & Biodiversity

Speaker: Al Sample; *Class discussion: CS/AA topics / research strategies; Readings, Solution article; Buffett Team meetings*

Read for today's discussion (52 pages + 29 conditionally optional + 4 Solution article)

1. *Conservation Biology for All: (Ch. 1 & 2 are optional but recommended for those with background in conservation biology/ biodiversity,. Everyone else should read them.)*:
   Introduction (6 pp); Chapter 1: Conservation biology: past and present (15 pp); Chapter 2: Biodiversity (14 pp)
2. *The Future of Nature*:
   a. (**1-D**) What is Conservation Biology: Michael Soulè and commentary (**2-D**) by Libby Robin (pp. 391-408) (14 pp)
   b. (**3-D**) Council on Environmental Quality and commentary (**4-D**) by M. V. Barrow Jr. (page 381-390) (10 pp)
3. (**5-D**) Kareiva & Marvier, Bioscience, 2012. What is conservation science? (7 pp)
4. (**6-D**) Soulè, Conservation Biology, 2013. The "new conservation". (2 pp)
5. Hutchinson, G. E. (1959). Homage to Santa Rosalia or why are there so many kinds of animals? *The American Naturalist*, *93*(870), 145–159. https://doi.org/10.1086/282070 (13 pp)
6. **Solution article example 2: Striking a Deal with the Weed from Hell (4 pp)**

DUE by class: CS/AA topic. Enter into the Forum on Discussion Board; discuss ideas in class.

WEEK 4: February 14 : Ecosystem Services

Speaker: Al Sample; *Class discussion: Readings, Solution article; Buffett Team meetings*

Read for today's discussion (64 pages)

1. *Conservation Biology for All*: Chapter 3: Ecosystem functions and services (22 pp)
2. *The Future of Nature*:
   a. (**7-D**) The Invaders: Charles S. Elton and commentary (**8-D**) by Libby Robin (13 pp)
   b. Nature's Services: Societal dependence on natural Ecosystems: (**9-D**) Gretchen Daily and commentary (**10-D**) by Richard B.Norgaard (11 pp)
3. (**11-D**) Who Is Conservation For? By: Paul Voosen (11 pp)
4. Millennium Ecosystem Assessment framework (1 p)
5. Bacteria Could Help Fight Zika, Study Finds (3 pp)
6. Risks of *Wolbachia* mosquito control (1 p)
7. **Solution article example 3: TV as Birth Control (8 pp)**

DUE: Solutions Article by 11:59 pm today by email to your TA, who will approve it and post it to Bb.
DUE NEXT WEEK: Case Study/AA title, description, etc. See below.

WEEK 5: February 21: Habitat Fragmentation

Speaker: Al Sample; Recorded presentation: Professor Thomas Lovejoy: The Forest Fragments Project
Class discussion: Readings; Solution articles; Buffett Team meetings

Read for today's discussion (43 pp + solution articles)

1. *Conservation Biology for All*: Chapter 5: Habitat fragmentation and landscape change (16 pp)
2. (**12-D**) Laurance, et al. (2018). An Amazonian rainforest and its fragments as a laboratory of global change. (19 pp)
3. (**13-D**) Lovejoy & Nobre (2018). Amazon tipping point (1 p) +
4. (**13-D**) Lovejoy & Nobre (2019) Amazon tipping point: Last chance for action (2 pp)
5. (**14-D**) Conniff (2018). Amid the plunder of forests, a ray of hope. (1 p)
6. Tollefson (2013). Splinters of the Amazon. Nature, (4 pp)

- Solution article(s) assigned for today (Be prepared for the first 3)

Supplemental article: Tilman (2006). Biodiversity and ecosystem stability in a decade-long grassland experiment. (3)

DUE by 3 pm today: Case study/AA title, 1-page description, and preliminary list of references for both options. Also a 1-page outline (if CS), or a 1-page work plan (if AA). APA 7th edition format required.

WEEK 6: February 28: Beyond the Obituaries: Success Stories in Conservation

Invited Guest Speaker: Dr. Nancy Knowlton, Sant Chair in Marine Science Emerita, Smithsonian National Museum of Natural History

Class discussion: Readings; Solution articles; Presentation Tips

Read for today's speaker & discussion (26 pages + supplementary info)

1. Duarte et al. (2020). Rebuilding marine life. (11 pp)
    a. Duarte supplementary info
2. Knowlton, N. (2021). Ocean Optimism: Moving Beyond the Obituaries in Marine Conservation. (15 pp)

- Solution article(s) assigned for today (Be prepared for the next 3)

Supplementals (optional):

- Leslie et al. (2013). How good science and stories can go hand in hand. (3 pp)
- Johns & Jacquet (2018). Doom and gloom versus optimism: an assessment of ocean-related U.S. science journalism (2001-2015) (6 pp)
- Mazaris, et al. (2017). Global sea turtle conservation successes. (6 pp)
- de los Santos et al. (2019) Recent trend reversal for declining European seagrass meadows. (7 pp)
- Visit and familiarize yourself with: http://ocean.si.edu/ (optional)

ASSIGNMENT: Reflection 3: Nancy Knowlton's presentation and class discussion (Due Friday, March 4, by 11:59 pm)

WEEK 7: March 7: Biodiversity and climate change: Implications for terrestrial and marine conservation

Invited Guest speaker: Dr. Lee Hannah, Senior Scientist for Climate Change Biology, Moore Ctr for Sci, Cons. Intl.

Class discussion: Midterm; Readings; Solution articles; Presentation Tips

Read for today's discussion (~~55 pages + 18 optional~~)

1. *Conservation Biology for All*: Chapter 8: Climate change (8)
2. *The Future of Nature*:
    a. The Economics of Climate Change (**15-D**) Nicholas Stern and commentary by (**16-D**) Paul Warde (12)
    b. Resilience and the Stability of Ecological Systems: (**17-D**) C. S. Hollings and commentary (**18-D**) by Libby Robin (14)
    c. A Safe Operating Space for Humanity (**19-D**) Rockstrom et al and commentary (**20-D**) by Susan Owens (9)

Recommended

- Steffen et al. 2015. Planetary boundaries: Guiding human development on a changing planet. Science Express (13) This article relates to: A Safe Operating Space for Humanity: Johan in the Future of Nature.
- Tollefson, Nature Climate Change, 2011 (2)
- Blaustein, BioScience, 2011 (7)
- Lovejoy & Hannah (2018) Avoiding the climate failsafe point (1)
- Lovejoy, 2013 editorial The Climate Change Endgame (2)

Optional:

- No Apologies, No Regrets: Michael Mann and the Hockey Stick Graph of Rising Global Temperatures (4)
- Yellow fever kills 600 monkeys in Brazil's Atlantic Rainforest (1)

Read for today's Guest Speaker:

Readings from: Lovejoy, T. E., & Hannah, L. (Eds.). (2019). *Biodiversity and Climate Change: Transforming the Biosphere*. Yale University Press. https://doi.org/10.2307/j.ctv8jnzw1

- Preface (2 pp)
- Chapter 25: Regreening the Emerald Planet: The Role of Ecosystem Restoration in Reducing Climate Change (6)
- Chapter 3: Range and Abundance Changes (12)
- Case Study 1: The Bering Sea and Climate Change (3)
- Chapter 5: Coral Reefs: Megadiversity Meets Unprecedented Environmental Change (9)
- Chapter 24: Climate Change Mitigation Using Terrestrial Ecosystems: Options and Biodiversity Impacts (10)

Buffett presentations in 2 weeks (our next meeting)

TAKE HOME MIDTERM: Due 11:59 pm Monday, March 14th

WEEK 8: March 14: SPRING BREAK – NO CLASS

WEEK 9: March 21: Buffett Awards; Conservation & religion
Buffet presentations and discussion
Invited Guest speaker: Dr. Kyle Van Houtan: Moral & ethical considerations in biodiversity conservation

Read for today's speaker & discussion (21 pages + 31 optional)
1. Van Houtan, K. S. (2010). Conservation, biology, and religion. In N. S. Sodhi & P. R. Ehrlich, *Conservation biology for all* (pp. 270–272). Oxford University Press. (3 pp)
2. Van Houtan, K. S. (2006). Conservation as virtue: a scientific and social process for conservation ethics. *Conservation Biology*, *20*(5), 1367-1372. https://doi.org/10.1111/j.1523-1739.2006.00447.x (5 pp.)
3. Leopold, A. C. (2004). Living with the Land Ethic. *BioScience*, *54*(2), 149. https://doi.org/10.1641/0006-3568(2004)054[0149:LWTLE]2.0.CO;2 (5 pp)
4. Sample, V. A. (2018). Normative and ethical foundations of ecological forestry in the United States. *Journal of Forestry*, *116*(4), 374-381. https://doi.org/10.1093/jofore/fvy011 (8 pp)

Recommended:
1. Van Houtan, K. S., & Pimm, S. L. (2006). The various Christian ethics of species conservation. In D. M. Lodge & C. Hamlin, *Religion and the new ecology: Environmental responsibility in a world in flux* (pp. 116–147). University of Notre Dame Press. (31 pp)

DUE: Have one member of your group upload your group's slides to Blackboard Assignments.
ASSIGNMENT: Reflection 4: Kyle Van Houtan presentation/discussion (Due Fri. March 25, 11:59 pm)
ASSIGNMENT: Reflection 5: Buffet Team experience & discussion (Due Sunday, March 27 by 11:59 pm)

WEEK 10: March 28: Sustainable development; A Conservationist's Perspective on the Global Amphibian Crisis
Invited Guest Speaker: Dr. Brian Gratwicke, Conservation Biologist, Smithsonian's National Zoo & Conservation Biology Institute
Class discussion: Readings

Read for today's discussion (27 pp + 36 optional)
1. The Future of Nature: The Limits to Growth (**21-D**) Meadows et al. and (**22-D**) commentary by Egan (15 pp)
2. (**23-D**) United Nations Sustainable Development Goals (1 p)
3. Brundtland Huntington prize speech (11 pp)

Optional: Independent Advisory Group on Sustainability (IAG report) (36 pp)

Read for today's speaker (19 pages + 22 optional)
1. Scheele, B.C., et al. (2019). Amphibian fungal panzootic causes catastrophic and ongoing loss of biodiversity. *Science*, *363*, 1459–1463. (4 pp)
2. Klocke, B., et al. (2017). Batrachochytrium salamandrivorans not detected in U.S. survey of pet salamanders. *Scientific Reports*, *7*(1), 13132. https://doi.org/10.1038/s41598-017-13500-2 (4 pp)
3. Lewis, C.H.R., et al. (2019). Conserving Panamanian harlequin frogs by integrating captive-breeding and research programs. *Biological Conservation*, *236*, 180–187. https://doi.org/10.1016/j.biocon.2019.05.029 (7 pp)

Recommended:
1. Gratwicke, B., Neff, M., Mayer, L.R., Ryan, S., & Sevin, J. (2016). Education and outreach. In C. K. Dodd (Ed.), *Reptile ecology and conservation: A handbook of techniques* (pp. 436–448). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198726135.003.0030
2. Amphibian Ark (Science, 2013) (1)
3. Will amphibians croak under the endangered species act? (BioScience, 2012) (4)
4. Evaluating the probability of avoiding disease-related extinctions of Panamanian amphibians through captive breeding programs (Animal Conservation 2015) (10)

ASSIGNMENT: Reflection 6: Brian Gratwicke presentation/discussion (Due Fri. April 1, 11:59 pm)

WEEK 11: April 4: Science Communication
Speaker: Cheryl Rash Jones: Engaging Diverse Audiences Effectively Without Making Things Worse
Presentation Tips
Class discussion: Readings; Solution article(s); Presentation Tips

Read for today's discussion (42 pages + 19 optional + solution articles)

1. He & Hubbel, Nature 2011. Species–area relationships always overestimate extinction rates from habitat loss (4 pp) Note writing style only – not necessary to read thoroughly.
2. (**24-D**) Intrinsic Motivation in Museums: Why Does One Want to Learn? Csikszentmihalyi and Hermanson (9 pp)
3. (**25-D**) Hein (1991) Constructivist Learning Theory (7 pp)
4. (**26-D**) Elbow, P. (2006). The Believing Game and How to Make Conflicting Opinions More Fruitful (10 pp)
5. (**27-D**) Simis, M. J., Madden, H., Cacciatore, M. A., & Yeo, S. K. (2016). The lure of rationality: Why does the deficit model persist in science communication? *Public Understanding of Science*, *25*(4), 400–414. (12 pp)
6. (**28-D**) You're not going to believe what I'm about to tell you – The Oatmeal
7. (**29-D**) Video: This is why eating healthy is hard

Recommended:

1. Falk & Dierking (2002) Lifelong Learning (6 pp)
2. The missing pillar: Eudemonic values in the justification of nature conservation (Meaning making) (13 pp)

DUE by 11:59 pm today: Updated CS/AA outline

WEEK 12: April 11: Student case study/alternative assignment presentations, discussion; solutions

Download the Presentation Evaluation (on Bb), and fill it out for each presenter. Save with the specified naming format and submit to Assignments on Blackboard. Evaluating your classmates' presentations is part of your participation grade.

Read for today's discussion (solutions articles)

- Solution article(s) assigned for today (Be prepared for the next 3)

DUE by NOON today if you are presenting tonight: Presentation slides (Assignments) and Handout (Disc. Forum)
DUE by 11:59 pm today if you are presenting tonight: Draft of paper for peer review
DUE by 11:59 pm Friday if you are a reviewer this week: Peer reviewed paper

WEEK 13: April 18: Student case study/alternative assignment presentations & discussion; solutions

Download the Presentation Evaluation (on Bb), and fill it out for each presenter. Save with the specified naming format and submit to Assignments on Blackboard. Evaluating your classmates' presentations is part of your participation grade.

Read for today's discussion (solutions articles)

- Solution article(s) assigned for today (Be prepared for the next 3)

DUE by NOON today if you are presenting tonight: Presentation slides (Assignments) and Handout (Disc. Forum)
DUE by 11:59 pm today if you presented last week: Case study paper
DUE by 11:59 pm today if you are presenting tonight: Draft of paper for peer review
DUE by 11:59 pm Friday if you are a reviewer this week: Peer reviewed paper if you are a reviewer this week.

WEEK 14: April 25: Student case study/alternative assignment presentations & discussion; solutions

Download the Presentation Evaluation (on Bb), and fill it out for each presenter. Save with the specified naming format and submit to Assignments on Blackboard. Evaluating your classmates' presentations is part of your participation grade.

Read for today's discussion (solutions articles)

- Solution article(s) assigned for today (Be prepared for the next 3)

DUE by NOON today if you are presenting tonight: Presentation slides (Assignments) and Handout (Disc. Forum)
DUE by 11:59 pm today if you presented last week: Case study paper
DUE by 11:59 pm today if you are presenting tonight: Draft of paper for peer review
DUE by 11:59 pm Friday if you are a reviewer this week: Peer reviewed paper

WEEK 15: May 2: Museums' Role in the Conservation of Biodiversity
Virtual Field trip: Smithsonian National Museum of Natural History (NMNH)
Invited Guest Speaker: Gary Krupnick, Head of the Plant Conservation Unit, Department of Botany, NMNH

Read for today's discussion (25 pages)

1. Belkin, D. (2018, August 14). Rhododendron? Hydrangea? America doesn't know anymore. *The Wall Street Journal.*
2. Funk, Vicki A. (2018). Collections-based science in the 21st Century. *Journal of Systematics and Evolution* 56 (3):175–193. https://doi.org/10.1111/jse.12315 (15 pp)
3. Krupnick, G., & Knowlton, N. (2017). Earth Optimism: Success stories in plant conservation. *Annals of the Missouri Botanical Garden*, *102*(2), 331–340. https://doi.org/10.3417/D-16-00010A (7 pp.)
4. Krupnick, G. A., Kress, W. J., & Wagner, W. L. (2009). Achieving Target 2 of the Global Strategy for Plant Conservation: Building a preliminary assessment of vascular plant species using data from herbarium specimens. *Biodiversity Conservation, 18,* 1459-1474. https://doi.org/10.1007/s10531-008-9494-1 (10 pp)

Recommended:

1. Carrington, C.M.S., Krupnick, G.A., & Acevedo-Rodríguez, P. (2017). Herbarium-based preliminary conservation assessments of Lesser Antillean endemic seed plants reveal a flora at risk. *The Botanical Review* 83(2), 107-151. http://dx.doi.org/10.1007/s12229-017-9182-5 (42 pp – 11 + 31 pp tables)

DUE by 11:59 pm today if you presented last week: Case study paper
ASSIGNMENT: Reflection 7: Smithsonian Museum of Natural History field trip, presentation and discussion. Due Friday, May 6, by 11:59 pm

FINAL QUIZ / LAST QUESTIONS assigned: Due this Saturday by 11:59 pm.

WEEK 16: May 9: NO CLASS – READING DAY

WEEK 17: May 16: Course wrap-up
We expect to use this final exam period to wrap up the course, and present a film to tie the course together.

Tips for understanding and succeeding in this course:

- Stay organized. This is a well-rounded class, and there's a lot going on. Keep a calendar of assignments, etc.
- If something seems unclear, please ask!
- Readings are generally heavier up front; understanding builds on these. Case study/Alt Assignment comes later when readings are generally lighter and you have built a foundation.
- *Future of Nature* includes classic, foundational articles + more contemporary responses. This helps you understand the development of the field.
- Read everything, but we will not necessarily discuss everything. In graduate school you are expected to know it even if we did not discuss it in class.
- Some assignments are designed for you to tailor to your own interests – specifically, the Solutions Discussion and Case Study.
- Solutions Discussions are fit in wherever there is time, to allow for flexibility with other content, which may go longer or shorter than expected. You should always be prepared to discuss the next 3.
- Spelling and grammar do matter. Please consult the Writing Center. Have a quick question? Ask your TA.

Excerpted GMU Academic calendar Spring 2022 (https://registrar.gmu.edu/calendars/spring_2022-1/):

Last Day of Class	Sat. May 7
Reading Day(s): Reading days provide students with additional study time for final examinations. Faculty may schedule optional study sessions, but regular classes or exams may not be held.	Mon. May 9 - Tues. May 10
Examination Period	Wed. May 11 - Wed. May 18
University Commencement	Fri. May 20