

BIOL 4020/6020 Special Topics in Conservation Biology: “Endangered Species Conservation”

Spring 2019, Dr. Brad Bergstrom, bergstrm@valdosta.edu

Lecture 3:30-4:20 MW in BSC 1024, Recitation 2:00-3:50 T BSC 3018

Office Hrs 2-2:50 M, 11-11:50 T; other times by appt., BSC 1107, 333-5770

Purpose and Goals: Biology majors who have completed Genetics, and Ecology and Evolution, will have the necessary background to study the modern science of Conservation Biology as applied to the goal of understanding the factors leading to endangerment of species and to the strategies and tactics for conserving biodiversity and especially rare, endangered, and otherwise important species. We will also explore laws, policy and societal factors. Two lectures per week plus a recitation period for group discussion of the current literature and special projects.

Recommended References for Background Reading and Research (see lecture topics below; other book chapters and articles TBA) can be accessed free through Odum Library-Galileo Ebooks; e.g., “C&F” is: Carroll, S.P. and C.W. Fox (eds). 2008. *Conservation Biology : Evolution in Action*. Oxford University Press. 393 pp. It and other books listed below (plus still others are on my Ebook Central bookshelf: https://ebookcentral.proquest.com/lib/valdosta/bookshelf.action?folderId=1810845&folderOption=BOOKSHELF_FOLDER Please register and set up your own bookshelf.

Software: Lacy, R.C., and J.P. Pollak. 2014. Vortex: A stochastic simulation of the extinction process. Version 10.0. Chicago Zoological Society, Brookfield, Illinois, USA. Download Vortex 10.3, plus lite model “Eddy”, plus users’ manual (free) at: <http://vortex10.org/Vortex10.aspx>

| <u>Tentative Weekly Lecture Topics</u> | Chapters in C&F (Chapters in R&M) [Chapters in Caro] {Chapters in McD&W} ¹ |
|---|--|
| 1. Domain, history of ConsBiol; types, values of biodiversity; ecosystem services | 1,6 (2,8) |
| 2. Extinction history and risks; causes of endangerment | 2 (3) |
| 3. Habitat loss and fragmentation | 4 |
| 4. Endemism; biodiversity hotspots; keystone, umbrella, and indicator species | (6) [4,6] |
| *5. Conservation Genetics (homework) | 3,5 |
| 6. Landscape Ecology and Metapopulation dynamics | 4 |
| 7. Population viability analysis (homework) | 2 (6) |
| 8. Legislation, Policy and the Endangered Species Act | Readings #7 |
| 9. Taxonomy and the ESA | 7 |
| *10. Trophic Cascades and Ecosystem Restoration | 14,16 [5] |
| 11. Conservation Planning, Management and Species Restoration | (7,8,12) |
| 12. Conservation under a changing climate | 10,13 |
| 13. Societal challenges | (9,10) |
| 14. Ex situ preservation (captive breeding and re-introduction) | {22} |
| *15. Case Studies and Conclusions | {10-17 TBA,25} |

*Approximate time of 3 hour-exams, 3rd given during scheduled Final Exam period (Th May 9, 2:45 pm).

¹References (other than C&F, listed above) are as follows, from Proquest Ebooks:

R&M = Raphael, M.G., and R. Molina. 2007. Conservation of Rare or Little-Known Species : Biological, Social, and Economic Considerations. Island Press, Washington DC.

Caro = Caro, T. 2010. Conservation by Proxy : Indicator, Umbrella, Keystone, Flagship, and Other Surrogate Species. Island Press, Washington DC.

McD&W = Macdonald, D.W., and K.J. Willis. 2013. Key Topics in Conservation Biology 2. Wiley Publishers, Somerset, NJ.

Recitation Sessions—tentative weekly schedule:

| <u>Week</u> | <u>Topic</u> | <u>Activity</u> |
|-------------|--|-----------------------------|
| 1 | Introduction to Vortex (PVA) | computer simulation program |
| 2 | Extinctions: past, present, future | readings |
| 3 | Biodiversity I: values, ecosystem services | readings |
| 4 | Biodiversity II: important species types | readings |
| 5 | ESA listing, delisting | readings |
| 6 | Conservation genetics | readings |
| 7 | Metapopulations & landscape ecology | readings |
| 8 | Extinction Risk and Population Viability Analysis | readings* (Mar 5) |
| 9 | Taxonomic considerations of ESA | readings* (Mar 12) |
| 10 | Trophic cascades | readings* (Mar 26) |
| 11 | Ecosystem restoration | readings* (Apr 2) |
| 12 | Species Recovery under ESA | readings* (Apr 9) |
| 13 | Climate Change and Conservation | readings* (Apr 16) |
| 14 | Societal Challenges | readings* (Apr 23) |
| 15 | Ex Situ Preservation, captive breeding, reintroduction | readings* (Apr 28) |

Readings will be posted to BlazeView and/or VSU Network (V) Drive under your classes.

* = Student discussion leader

Grading: 3 100-pt exams (300); discussion leader (50), discussion participation + attendance (40), open-notes quizzes pre-discussion (100); homeworks (30), Vortex project/paper (50; 10 of which come from prospectus); TOTAL 570. Letter grades: 500-570 A, 425-499 B, 350-424 C, 275-349 D, 0-348 F. NOTE: each student will be in charge of presenting one topic and set of papers for a discussion during recitation; graduate students (**BIOL 6020**) will lead two discussions and do a more detailed project.

Endangered Species Conservation (BIOL 4020/6020) – Spring 2019 Expectations of Students

1. The text chapters will serve as your introduction and background to the lecture topics. Assigned readings from the literature will delve into issues in detail. Read them both carefully, the latter necessarily before recitation and the former preferably before the lecture; otherwise, you may find that: a) you are lost in lecture, and b) that you will not contribute meaningfully to discussion and thus will be graded down. Success in this course demands that you attend every day and come to class prepared.

2. Attendance at all recitation sessions is mandatory; you will be allowed to miss only one before points are deducted from your course score, and only one (lowest) quiz grade will be dropped (if you miss, that will be your one drop grade).

3. If you should have any kind of question, problem, comment, complaint, crisis, etc., involving this course, I'm the appropriate person for you to talk to. Please come by and see me about it immediately; that's what I'm here for. Feel free to stop by anytime (but try office hours first).

4. **STUDENTS WITH DISABILITIES:** Students requiring classroom or testing accommodations because of documented disabilities should discuss their needs with the instructor at the beginning of the quarter. To register with the Access Office, go to Farber Hall or call 245-2498 (voice) or 219-1348 (tty).

BIOL 4020-6020, Spring 2019, COURSE GOALS AND LEARNING OUTCOMES:

With reference to the Educational Outcomes for the B.S. or B.A. Degrees in Biology (see p. 117 of 2013-2014 VSU Undergraduate Catalog) and as explained above, BIOL 4020 is particularly designed to give the student extensive background in Outcome #5 and partial background in Outcome #1.

With reference to the VSU General Education Outcomes¹, BIOL 4020 will significantly address the following: #3) Students will use computer and information technology when appropriate; #4) Students will express themselves clearly, logically, and precisely in writing and in speaking, and they will demonstrate competence in reading and listening; #7) Students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written, and visual materials.

¹<http://www.valdosta.edu/academic/VSUGeneralEducationOutcomes.shtml>