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Lecture: Tu-Th: 8:00-9:15 Olin 234

Office Hours: Tu: 1:00-2:00, Fri 10:00-11:00, by appointment, or stop by

Brief Course Description

Much of the natural world is at risk. We live at a time of rapid environmental change, where species are being driven extinct, ecological communities are being dismantled, and the functional processes of ecosystems are being disrupted. These environmental impacts are the result of complex interactions among multiple human and natural processes. Rapid growth in human populations, dramatic changes in land use, and the growing scale of the human economy are resulting in dramatic changes to the planet's biological diversity at local to global scales.

This interdisciplinary course is intended to provide a comprehensive introduction to the conservation of biological diversity, with particular attention to the policy and management aspects of endangered species conservation. Topics include ecosystem management, laws and institutions, human-wildlife conflict, attitudes and ethics, community-based conservation, and complexity. We will explore case studies and interdisciplinary methods and approaches used to conserve endangered species. This is a lecture-based course, but considerable emphasis will be placed on individual and group exercises and discussions, reading from the primary literature, discussions of case studies, and an independent research project.

One goal of this course is to introduce you to some of the fundamental ecological, management, and policy principles that can be used to understand the causes of—and potential solutions to—this extinction crisis. A second goal of this course is to introduce you to some of the most influential writers and thinkers in the field of endangered species conservation, policy, and management, including the likes of Gary Meffe, Reed Noss, E.O. Wilson, Steven Yaffee, Tim Clarke, C.S. Holling, Stephen Carpenter, Simon Levin, Richard Forman, and many others. A third goal of the course is to expose you to the complexities of endangered species conservation policy and practice and to increase your understanding of the role of interdisciplinary research and analyses to these problems. You will have the opportunity to draw on your own academic strengths and backgrounds in discussions of domestic and international case studies. Finally, this course will enable you to gain experience applying the principals and tools of conservation science to applied conservation solutions. You will be expected throughout the semester to develop your analytical, writing, discussion, and presentation skills.

Required Texts

Baron, D. 2004. *The Beast in the Garden: A Modern Parable of Man and Nature*. New York: Norton.

Meffe, G.K., L. A. Nielsen, R. L. Knight, and D.A. Schenborn. 2002. *Ecosystem Management: Adaptive, Community-Based Conservation*. Washington, D.C.: Island Press.

The assigned readings will be available electronically via the library electronic reserves or the fileserver.

Speakers

Jeff Muntifer, a colleague I have collaborated with on work in China, will speak to our class in his capacity as a representative of Round River Conservation Studies' Africa Program and discuss some of his international research experiences. In addition, you will be expected to attend two of the following three Environmental Studies Program Colloquia relevant to our class: Roger Fleming, Conservation Law Foundation, "Ocean Sprawl, ecosystem-based management, and our ocean's future" (February 8, 7:00 pm); Florence Reed, "More food equals more forest: A sustainable model for rural development in the

tropics" (February 22, 7:30 pm); or Tim Waverly, Maine PEER, "Allagash! A national treasure at risk." (March 8, 7:00 pm). All three evening talks are in Olin 1. Please contact me beforehand if you have a conflict with these evening talks.

Course Requirements

Your grade will be based on a small computer simulation assignment (5 pts.); a mid-term exam (20 pts.); a final exam (30 pts.); an independent research project (25 pts.); and participation in class discussions, events, and speakers (20 pts.). Guidelines describing the independent research project will be handed out in class.

Draft Schedule

| Wk | Date | Topic | Readings, assignments, events |
|-----------------|--------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| February | | | |
| 1 | Th 3 | Introduction | Video: Don't Say Goodbye |
| 2 | Tu 8 | Guest Speaker: Jeff Muntifering (in class) | Meffe ch. 1 (7:00 pm Olin 1 Roger Fleming) |
| | Th 10 | Endangered species crisis in context | Wilson <i>Future of Life</i> (pp. 6-17) (Sodhi et al. 2004) (Wackernagel et al. 2002) (Meffe 1998) |
| 3 | Tu 15 | Introducing ecosystem management | Meffe ch. 2 (Yaffee & Wondolleck 2000) (Yaffee 1999) |
| | Th 17 | Uncertainty, complexity, management, & policy | Meffe ch. 3 (Lindenmayer et al. 2004) (Peterson et al. 2003) (Holling 2001) (Levin 1999) |
| 4 | Tu 22 | Adaptive management | Meffe ch. 4 Collaboration/discussion (7:30 pm Florence Reed) |
| | Th 24 | Endangered species law and policy | (Levy 2003; Norris 2004) (Doremus & Pagel 2001) (Ginsberg 2004) (Keiter & Locke 1996) (Ross 2003) |
| March | | | |
| 5 | Tu 1 | Genes and species in management and policy | Meffe ch. 5 and ch. 6 (Myers et al. 2004) Draft project idea due |
| | Th 3 | Populations in management and policy | Meffe ch. 7 |
| 6 | Tu 8 | Vortex simulation (computer lab) | (Karieva 2001) (Tim Waverly 7:00 pm) |
| | Th 10 | Landscape-level management and policy | Meffe ch. 8 (Noss 2002) (Redford et al. 2003) (Berger 2003) |
| 7 | Tu 15 | Landscape-level management and policy (cont.) | Meffe ch. 9 (Bienen 2002) (Havlick 2004) (Deem et al. 2001) (Forman et al. 2003 chs. 5, 14) |
| | Th 17 | Exam | Exam |

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|--------------|--------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| | Tu 22 | SPRING BREAK MARCH | |
| | Th 24 | SPRING BREAK MARCH | |
| 8 | Tu 29 | Collaboration exercise | |
| | Th 31 | <i>Beast in the Garden</i> discussions | Baron ch. 1 – ch. 9 Bibliography and summary due |
| April | | | |
| 9 | Tu 5 | <i>Beast in the Garden</i> discussions | Baron ch. 10 – ch. 15 and epilogue (Treves & Karanth 2003) |
| | Th 7 | Large carnivores and human-wildlife conflict | (Clark et al. 1996) (Primm & Clark 1996) |
| 10 | Tu 12 | Case studies: Wolves, bears and policy oh my! | Nie ch. 2 (2003) (Defenders of Wildlife 2004) |
| | Th 14 | Case studies (cont.) | Video (Nyhus et al. 2003b) |
| 11 | Tu 19 | Case study: Tigers | (Nyhus & Tilson 2004) (Tilson et al. 2004) |
| | Th 21 | Case studies (cont.) | Video |
| 12 | Tu 26 | Working with local communities and stakeholders | Meffe ch. 10 and ch. 11 (Christensen 2004) (Ferraro & Kiss 2002) (Nyhus et al. 2003a) (Ellison 2003) |
| | Th 28 | Projects | Final project due |
| 13 | Tu 3 | Evaluating endangered species policy and practice | Meffe ch. 12 (Christensen 2003) |
| | Th 5 | Closing comments | |
| FINAL | | | Final Exam |

Readings

- Berger, J. 2003. Is It Acceptable to Let a Species Go Extinct in a National Park? *Conservation Biology* **17**:1451-1454.
- Bienen, L. 2002. Informed decisions: Conservation corridors and the spread of infectious disease. *Conservation in Practice* **3**:10-17.
- Christensen, J. 2003. Auditing conservation in an age of accountability. *Conservation in Practice* **4**:12-19.
- Christensen, J. 2004. Win-win illusions. *Conservation in Practice* **5**:12-19.
- Clark, T. W., A. P. Curlee, and R. P. Reading. 1996. Crafting Effective Solutions to the Large Carnivore Conservation Problem. *Conservation Biology* **10**:940-948.
- Deem, S. L., W. B. Karesh, and W. Weisman. 2001. Putting Theory into Practice: Wildlife Health in Conservation. *Conservation Biology* **15**:1224-1233.
- Defenders of Wildlife 2004. State of the Wolf 2004. Defenders of Wildlife, Washington, D.C.
- Doremus, H., and J. E. Pagel. 2001. Why Listing May Be Forever: Perspectives on Delisting under the U.S. Endangered Species Act. *Conservation Biology* **15**:1258-1268.
- Ellison, K. 2003. Renting biodiversity: The conservation concessions approach. *Conservation in Practice* **4**:20-29.
- Ferraro, P. J., and A. Kiss. 2002. Direct Payments for Biodiversity Conservation. *Science* **298**:1718-1719.
- Forman, R. T. T., and et al. 2003a. Further perspectives. Pages 375-400 in R. T. T. Forman, D. Sperling, J. A. Bissonette, A. P. Clevenger, C. D. Cutshall, V. H. Dale, L. Fahrig, R. France, C. R. Goldman, K. Heanue, J. A. Jones, F. J. Swanson, T. Turrentine, and T. C. Winter, editors. *Road Ecology: Science and Solutions*. Island Press, Washington, D.C.
- Forman, R. T. T., and et al. 2003b. Wildlife Populations. Pages 113-138 in R. T. T. Forman, D. Sperling, J. A. Bissonette, A. P. Clevenger, C. D. Cutshall, V. H. Dale, L. Fahrig, R. France, C. R. Goldman, K.

- Heanue, J. A. Jones, F. J. Swanson, T. Turrentine, and T. C. Winter, editors. Road Ecology: Science and Solutions. Island Press, Washington, D.C.
- Ginsberg, J. 2004. Enhancement of survival or abandonment of the Endangered Species Act? *BioScience* **54**:180-181.
- Havlick, D. 2004. Roadkill. *Conservation in Practice* **5**:30-34.
- Holling, C. S. 2001. Understanding the Complexity of Economic, Ecological, and Social Systems. *Ecosystems* **4**:390-405.
- Karieva, P. M. 2001. Conservation of Populations and Species. *Encyclopedia of Life Sciences*. Macmillan Publishers.
- Keiter, R. B., and H. Locke. 1996. Law and Large Carnivore Conservation in the Rocky Mountains of the U.S. and Canada. *Conservation Biology* **10**:1003-1012.
- Levin, S. 1999. *Fragile Dominion: Complexity and the Commons*. Perseus, Cambridge.
- Levy, S. 2003. Turbulence in the Klamath River Basin. *BioScience* **43**:315-320.
- Lindenmayer, D. B., D. R. Foster, J. F. Franklin, M. L. Hunter, R. F. Noss, F. A. Schmiegelow, and D. Perry. 2004. Salvage harvesting policies after natural disasters. *Science* **303**:1303.
- Meffe, G. K. 1998. Conservation Scientists and the Policy Process. *Conservation Biology* **12**:741-742.
- Myers, R. A., S. A. Levin, R. Lande, F. C. James, W. W. Murdoch, and R. T. Paine. 2004. Hatcheries and endangered salmon. *Science* **303**:1980.
- Nie, M. A. 2003. *Beyond Wolves: The politics of Wolf Recovery and Management*. University of Minnesota Press, Minneapolis, MN.
- Norris, S. 2004. Only 30: A portrait of the Endangered Species Act as a young law. *Bioscience* **54**:288-294.
- Noss, R. F. 2002. Context matters: Considerations for large-scale conservation. *Conservation in Practice* **3**:10-19.
- Nyhus, P., H. Fischer, F. Madden, and S. Osofsky. 2003a. Taking the bite out of wildlife damage. *Conservation in Practice* **4**:37-40.
- Nyhus, P. J., and R. Tilson. 2004. Agroforestry, elephants, and tigers: Balancing conservation theory and practice in human-dominated landscapes of Southeast Asia. *Agroforestry, Ecosystems, and the Environment* **104**:87-97.
- Nyhus, P. J., R. L. Tilson, and J. L. Tomlinson. 2003b. Dangerous animals in captivity: *Ex situ* tiger conflict and implication for private ownership of exotic animals. *Zoo Biology* **22**:573 - 586.
- Peterson, G. D., G. S. Cumming, and S. R. Carpenter. 2003. Scenario Planning: a Tool for Conservation in an Uncertain World. *Conservation Biology* **17**:358-366.
- Primm, S. A., and T. W. Clark. 1996. Making Sense of the Policy Process for Carnivore Conservation. *Conservation Biology* **10**:1036-1045.
- Redford, K. H., P. Coppolillo, E. W. Sanderson, G. A. B. d. Fonseca, E. Dinerstein, C. Groves, G. Mace, S. Maginnis, R. A. Mittermeier, R. Noss, D. Olson, J. G. Robinson, A. Vedder, and M. Wright. 2003. Mapping the conservation landscape. *Conservation Biology* **17**:116-131.
- Ross, J. R. 2003. *Where the wild things are*. Smithsonian.
- Sodhi, N. S., L. P. Koh, B. W. Brook, and P. K. L. Ng. 2004. Southeast Asian biodiversity: An impending disaster. *Trends in Ecology and Evolution* **19**:654-660.
- Tilson, R., H. Defu, J. Muntifering, and P. J. Nyhus. 2004. Dramatic decline of wild South China tigers: Field survey of priority tiger reserves. *Oryx* **38**:40-47.
- Treves, A., and K. U. Karanth. 2003. Human-Carnivore Conflict and Perspectives on Carnivore Management Worldwide. *Conservation Biology* **17**:1491-1499.
- Wackernagel, M., N. B. Schulz, D. Deumling, A. C. Linares, M. Jenkins, V. Kapos, C. Monfreda, J. Lohi, N. Myers, R. Norgaard, and J. Randers. 2002. Tracking the ecological overshoot of the human economy. *PNAS* **99**.
- Yaffee, S. L. 1999. Three Faces of Ecosystem Management. *Conservation Biology* **13**:713-725.
- Yaffee, S. L., and J. M. Wondolleck. 2000. Making Collaboration Work: Lessons from a comprehensive assessment of over 200 wideranging cases of collaboration in environmental management. *Conservation in Practice* **1**:17-25.