

Course Syllabus: BIOL 1470 – Conservation Biology – Fall 2013

Conservation Biology is the scientific study of the phenomena that affect the maintenance, loss, and restoration of biological diversity. Topics covered include: 1) the impacts of global warming, species invasions, and habitat destruction on biodiversity, 2) strategies developed to combat these threats, and 3) a consideration of key economic and ethical tradeoffs. Special attention will be paid to current debate and controversy within this rapidly emerging field of study.

Objectives: To introduce students to the field of conservation biology. To enable them to make informed conservation decisions of local, national and international concern.

Lectures: Tuesdays and Thursdays (9-10:20), Smith-Buonanno Hall 201

Discussion Sections: Tuesdays or Wednesdays

Instructor: Dov F. Sax, 401-863-9676. **Office Hours:** TBA, 302 Walter Hall

TA: Emily Hollenbeck, hollenbeck.ec@gmail.com **Office Hours:** TBA

Required Text: Conservation Science: Balancing the Needs of People and Nature, Kareiva & Marvier

Curriculum Schedule:

<u>Week 1:</u> Sept 5 – Course Introduction	<u>Required Reading:</u> Lecture A
<u>Week 2:</u> Sept 10 – Ethics and conservation Sept 11 – <i>No discussion sections</i> Sept 12 – Environmental economics and environmental policy	Chapters 1 & 2 Chapters 3 & 4
<u>Week 3:</u> Sept 17 – Distribution of biodiversity Sept 18 – <i>Discussion I: Functioning of novel ecosystems</i> Sept 19 – Earth history and changes in species distributions	Reading A <i>See below</i> Reading B
<u>Week 4:</u> Sept 24 – Biotic responses to climate change Sept 25 – <i>Discussion II: “Re-wilding”</i> Sept 26 – Global climate change and extinction	Chapter 18 <i>See below</i> Chapter 9
<u>Week 5:</u> Oct 1 – Over exploitation, habitat destruction, and extinction Oct 2 – <i>No Discussion</i> Oct 3 – EXAM I	Chapter 13
<u>Week 6:</u> Oct 8 – Infectious disease and the wildlife trade Oct 9 – <i>Discussion III: Climate change and infectious disease</i>	<i>See below</i>

Oct 10 – Species invasions, part I – large scale patterns and issues	Chapter 17
<u>Week 7:</u>	
Oct 15 – Species invasions, part II – local scale patterns and issues	Chapter 16
Oct 16 – <i>Discussion IV: Invasions</i>	<i>See below</i>
Oct 17 – Species saturation and change in species diversity	Reading C
<u>Week 8:</u>	
Oct 22 – Minimum viable populations and extinction debt	Chapters 7 & 8
Oct 23 – <i>Discussion V: Disease, rabbits and lynx conservation</i>	<i>See below</i>
Oct 24 – Speciation	Reading D
<u>Week 9:</u>	
Oct 29 – Conservation management	Chapters 5 & 12
Oct 30 – <i>No Discussion</i>	
Oct 31 – EXAM II	
<u>Week 10:</u>	
Nov 5 – Translocation and managed relocation	Chapter 11
Nov 6 – <i>Discussion VI: Managed relocation</i>	<i>See below</i>
Nov 7 – Designing terrestrial reserves	Chapters 6 & 10
<u>Week 11:</u>	
Nov 12 – Designing marine reserves	Chapter 15
Nov 13 – <i>Discussion VII: Future of the Oceans</i>	<i>See below</i>
Nov 14 – Conservation Insights from an Indiana Field Site	Reading E
<u>Week 12:</u>	
Nov 19 – Agriculture and Conservation	Chapter 14
Nov 20 – <i>Discussion VIII: Agriculture and Conservation</i>	<i>See below</i>
Nov 21 – Climate Adaptation Planning and Policy	Chapter 19
<u>Week 13:</u>	
Nov 26 – Viewing of <i>Wild Parrots of Telegraph Hill</i>	
Nov 27 – <i>No discussion sections</i>	
Nov 28 – No lecture - Thanksgiving Holiday	
<u>Week 14:</u>	
Dec 3 – Guest Lecture, Dr. Kellner (Remote Sensing & Conservation)	Reading F
Dec 4 – <i>No discussion sections</i>	
Dec 5 – Agenda for the future	
<u>Reading Period:</u>	
Dec 10 – No lecture planned	
Dec 12 – No lecture planned	
Dec 17 (2PM) - Final Exam	

Required Readings For Lectures:

Chapters refer to those in *Conservation Science* by Karieva and Marvier, 2011

Reading A: Brown, J.H. and Kodric-Brown, A. 1977. Turnover rates in insular biogeography: Effect of immigration on extinction. *Ecology* 58: 445-449.

Reading B: Graham, R.W. et al. 1996. Spatial response of mammals to late Quaternary environmental fluctuations. *Science* 272: 1601-1606.

Reading C: Stachowicz, J.J. and Tilman, D. 2005. Species invasions and the relationships between species diversity, community saturation and ecosystem function. In *Species Invasions, Insights into Ecology, Evolution and Biogeography* (Sax, D.F. et al. eds.), Sinauer Associates, Sunderland, MA.

Reading D: Vences, M. et al. 2010. Madagascar as a model region of species diversification. *Trends in Ecology and Evolution* 24: 456-465.

Reading E: Wilcox, D.A. and Simonin, H.A. 1987. A chronosequence of aquatic macrophyte communities in dune ponds. *Aquatic Botany* 28: 227-242.

Reading F: TBA

Required Readings For Discussion Sections:

Discussion I: Functioning of Novel Ecosystems

Janzen, D. 1985. On ecological fitting. *Oikos* 45: 308-310.

Wilkinson, D.M. 2004. The parable of Green Mountain: Ascension Island, ecosystem construction and ecological fitting. *Journal of Biogeography* 31: 1-4.

Responses to Wilkinson 2004

Hobbs, R. J. et al. 2009. Novel ecosystems: implications for conservation and restoration. *Trends in Ecology and Evolution* 24: 599-605.

Discussion II: "Re-wilding"

Janzen, D.H. and Martin, P.S. 1981. Neotropical anachronisms: The fruits the Gomphotheres ate. *Science* 215: 19-27.

Donlan, J. et al. 2005. Re-Wilding North America. *Nature* 436: 913-914.

Responses in *Nature* (2005) to Donlan et al. ("re-wilding") article

Griffiths, C.J. et al. 2010. The use of extant non-indigenous tortoises as a restoration tool to replace extinct ecosystem engineers. *Restoration Ecology* 18: 1-7.

Discussion III: Climate change and infectious diseases

Lafferty, K.D. 2009. The ecology of climate change and infectious diseases. *Ecology* 90: 888-900.

Various replies to Lafferty 2009 – *Ecology* 90: 901-933.

Discussion IV: Invasions, ethics and objectivity

Vince, G. 2011. Embracing invasives. *Science* 331: 1383-1384.

Responses to Vince article

Davis, M.A. et al. 2011. Don't judge species on their origins. *Nature* 474: 153-154.

Responses to Davis et al. 2011

Discussion V: Disease, rabbits and lynx conservation

Wikipedia and other entries on infectious diseases of rabbits.

Palomares, F. et al. 2011. Assessment of the conservation efforts to prevent extinction of the Iberian lynx. *Conservation Biology* 25: 4-8.

Simon, M.A. et al. 2012. Reverse of the decline of the endangered Iberian lynx. *Conservation Biology* 26: 731-736.

Rodriguez, A. et al. 2012. Bringing science back to the conservation of the Iberian lynx. Conservation Biology 26: 737-739.

Discussion VI: Managed relocation

Thomas, C.D. 2011. Translocations of species, climate change, and the end of trying to recreate past ecological communities. Trends in Ecology and Evolution 26: 216-221.

Responses to Thomas et al. 2011

McIntyre, S. 2011. Ecological and anthropomorphic factors permitting low-risk assisted colonization in temperate grassy woodlands. Biological Conservation 144: 1781-1789.

Discussion VII: Forum on the future of the oceans

Summary of Workshop Report on Ocean Stresses and Impacts

Press release for report

Blog correspondence generated by report, press release and press coverage

Discussion VIII: Agriculture and Conservation

Balmford, A. et al. 2012. What conservationists need to know about farming. Proc. Roy. Soc. B 279: 2714-2724.

Wheeler, T. and von Braun, J. 2013. Climate change impacts on global food security. Science 341: 508-513.

Grading Policy:

Exam I – 20% of final grade

Exam II – 20% of final grade

Final Exam – 30% of final grade

Discussion Section – 30% of final grade (quizzes and participation)

Attendance at Discussion Sections:

Attendance and active participation in discussion sections is mandatory; each missed discussion section will result in 0 points for participation and the quiz of the day. Quizzes will be held at the beginning of discussion sections; if you are late you will miss the opportunity to take the quiz and receive 0 points on the quiz.

Make-up Examinations:

There will be no make up examinations with the following exceptions: 1) an agreement reached between the student and instructor prior to the examination, and 2) an unplanned event, such as a medical condition, traffic accident, et cetera, together with appropriate evidence of the event.