SPRING 2016: COURSE SYLLABUS
WILD 4600: Conservation Biology
TTh 10:30-11:45 am, BNR 314 (USU Logan Campus)
3 CREDITS, REQ: Wildlife Science, CREC Majors

Instructor:  Karen Beard, Professor
Office:  NR 132, 7-8220  Email: karen.beard@usu.edu
Office hours:  Tuesday, Thursday, 12 - 1 pm.  Because these office hours may not fit into every student’s schedule, or I may be busy with another student when you come by, you are encouraged to contact me by email to make alternative arrangements if necessary.  You can also just stop by.

TA:  Leandro do Nascimento
Office:  NR 323  Email:  le_nasc@hotmail.com

Canvas web support:  Lecture slides, handouts, readings and updated syllabi, etc. will be available on Canvas (https://learn-usu.uen.org/login).  Readings, etc. will be placed on the website a few days before they are required.  Lecture slides will be placed on the website the evening before the lecture, but will also likely be updated the same day as the lecture.

Course Description:  For most of the course, we will delve into principles and theories relating to the conservation of biological diversity.  The course will focus on the following topics: patterns and processes creating biological diversity; estimates of extinction rates; consequences of diversity losses; approaches to conserving diversity, including large-scale conservation planning; conservation biology tools, such as population viability analyses and conservation triage; and causes of diversity loss including habitat loss/fragmentation, invasive species, and climate change.  Prerequisites:  NR/Biol 2220 (3 cr) (Sp)

Pre-requisites:  This course is designed to build on basic ecological knowledge developed in “General Ecology” (NR/Biol 2220) and to complement the more applied knowledge obtained in “Plant and Animal Populations” (WILD 3810) and “Genetics in Conservation and Management” (WILD 4880).

Readings:  There is no required textbook.  There will be readings from scientific journal articles and other documents that will be available on the course website at least one class period prior to their discussion.  Students are expected to read assigned reading material before class and to contribute during class.  I will not assign either of these textbooks, but if you want background reading, Richard Primack’s Essential of Conservation Biology and Peter Kareiva’s Conservation Science are excellent choices.

Course Projects:  This semester everyone will participate in two group projects.  One project will be a research project on a hot topic in conservation.  For this project, your group will do a 5-minute presentation for the rest of the class at some point during the semester.  The second will be a group project focused on critically evaluating a state conservation plan.

Speed Talk:  A speed talk is a 5-minute oral presentation in the style of a scientific conference.  Students will submit powerpoint presentations, deliver a 5-minute presentation summarizing the key ideas and results of their review, followed by 3 minutes of questions from the audience.

Conservation Plans: Everyone will be assigned to a team that will do a critical review of a conservation plan.  The point of these assignments is to delve more deeply into some conservation issue with a species
of concern in Utah. The point of the assignment is to evaluate critically the plans for species in and around Utah and provide valuable advice to how we should proceed to conserve these species.

**Exercises:** Over the course of the semester, we will do several exercises. Some of them will be in-class calculations. Some of them will involve developing ideas in class with a small group. Some will involve completing more in-depth lab exercises or investigating topics outside of class. We will go over these in class and they will be due either during the class period that we are working on them or before the following class period. It will be useful if you bring computers with you to class for many of these exercises. Much appreciated! If you miss a class and therefore class exercise, it will be posted on the course website after the class. If you have problems completing the assignment before the next class period, come see me.

**Honors:** This class is offered as an Honors Class on a contract basis. Those students wishing to take this class for Honors should contact the instructor during the FIRST week of class.

**Course objectives:**
1) To gain factual knowledge (terminology, classifications, methods, trends) and learn fundamental principles, generalizations, and theories relevant to the conservation of biological diversity.
2) To learn to analyze and critically evaluate ideas, arguments, and points of view related to the field of conservation biology, and to learn to apply course material (to improve thinking, problem solving, and decisions).
3) To learn how to find and use resources for answering questions or solving problems, and to develop skills in expressing oneself orally and/or in writing as well as acquiring skills in working with others as a member of a team.

**Objectives from IDEA:**
1) Learning fundamental principles, generalizations, or theories.
2) Learning to apply course material (to improve thinking, problem solving, and decisions).
3) Learning how to find and use resources for answering questions or solving problems.

**Required as part of the course:**
1) Group work
2) Critical thinking
3) Oral communication
4) Writing
5) Mathematical/quantitative work

**Upon successful completion of this course students will be able to demonstrate:**
1) An understanding of basic conservation biology issues, including where the field has been and where it is going;
2) An understanding of the ecological principles upon which conservation decisions are made, and be able to cite examples of their use; and
3) Demonstrate an appreciation for, and some understanding of, the social, political, and economic factors that affect conservation.

**Student Evaluation:** Assessment of student performance will be based on three exams, successful completion of homework/in-class assignments, participation in one group project, and participation in one speed talk.
Break-down:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exams:</td>
<td>30%</td>
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<tr>
<td>Test #1:</td>
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<td>Test #2:</td>
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<td>Test #3:</td>
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<tr>
<td>Speed Talks:</td>
<td>13%</td>
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<tr>
<td>Evaluation of Conservation Plans:</td>
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<td>Turning in paper outline:</td>
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<td>Turning in draft:</td>
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<td>Graded draft:</td>
<td>5%</td>
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<td>10-minute presentation:</td>
<td>6%</td>
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<td>Final write-up:</td>
<td>6%</td>
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<tr>
<td>Homework/In-Class Exercises (10 exercises)</td>
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<td><strong>TOTAL</strong></td>
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- Tests will include short answer questions from class time and readings as well as short essay questions that focus on integration of the material presented. However, the large majority of questions are from lectures and discussions during class.
- Speed talks, discussions, and evaluations of conservation plans will require out-of-class research and preparation. We may discuss assignments **the class period they are due**. So, it is important that assignments are turned in on time.

**Important, Please Note:** Assignments are due IN CLASS on the assigned due date. Points will be taken off for late submissions (5% for EACH DAY that the assignment is late **INCLUDING** the day it is due). **Unless your assignment is 20 days late it is worth turning it in to get SOME points.**

**Students who are unable to attend an exam must contact me prior to the exam.** Arrangements for make-up exams will only be made for justifiable reasons. If you are looking for a returned assignment, exam, or anything else given out in class, it will likely be in my office (NR 132).

End of semester averages will be translated to letter grades as follows: 93-100%: A; 92-90%: A-; 89-88%: B+; 87-83%: B; 82-80%: B-; 79-78%: C+; 77-73%: C; 72-70%: C-; 69-68%: D+; 67-63%: D; <63%: F.

**Academic integrity:**
Each student has the right and duty to pursue his or her academic experience free of dishonesty. The Honor System is designed to establish the higher level of conduct expected and required of all USU students. Infractions (cheating, falsification, and plagiarism) and their associated penalties are described in the USU Academic Policies and Procedures Manual (www.usu.edu/policies). If you have questions about what may be plagiarism, please discuss with me. This syllabus is issued for the convenience of the students; it does not constitute a contract and may be changed by the instructor at any time.

**Accommodations for disabilities:**
Students with physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. All accommodations are coordinated through the Disabilities Resource Center (DRC) in Room 101 of the University Inn, 797-2444 voice, 797-0740 TTY, or toll free at 1-800-259-
Semester Schedule: WILD 4600: Subject to Change, Check Website Frequently

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<thead>
<tr>
<th>Date</th>
<th>Day(s)</th>
<th>T: Course Description, What is Conservation Biology?</th>
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<tbody>
<tr>
<td>Jan 12, 14</td>
<td>(T, Th)</td>
<td>Background: Primack Chapter 1</td>
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<td>• Reviewing syllabus and course expectations</td>
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<td>• Hand-out speed-talk topics</td>
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<td>• Student introductions</td>
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<td>• History/characteristics of the field</td>
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<th>Date</th>
<th>Day(s)</th>
<th>Th: What is Biological Diversity?</th>
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<tr>
<td></td>
<td></td>
<td>• Definition of biodiversity?</td>
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<td>• How many species on the planet?</td>
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<td>• Where is the world’s diversity found?</td>
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<td>• Exercise #1: How many species?</td>
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<td>Turn in species preferences, speed talk preferences, and team preferences</td>
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<tr>
<th>Date</th>
<th>Day(s)</th>
<th>T: Measuring Extinctions</th>
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<tr>
<td></td>
<td></td>
<td>• Background extinction</td>
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<td>• Measured extinctions</td>
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<td>• Estimating extinction</td>
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<td>• Exercise #2: Species-area relationship</td>
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<tr>
<th>Date</th>
<th>Day(s)</th>
<th>Th: Vulnerability to Extinction</th>
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<tr>
<td></td>
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<td>• Major threats to extinction</td>
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<td>• General characteristics of vulnerable species, rarity, distinctiveness</td>
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<td>• Exercise #3: Estimating extinction</td>
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<th>Date</th>
<th>Day(s)</th>
<th>T: Discussion on the 6th Mass Extinction</th>
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<tr>
<td></td>
<td></td>
<td>Reading: Ceballo et al. 2015</td>
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<td>• Exercise #4: What is the IUCN? What is NatureServe? Let’s play</td>
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<th>Date</th>
<th>Day(s)</th>
<th>Th: Discussion of Management Plans</th>
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<tr>
<td></td>
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<td>• 4 Speed talks: Extinctions of cetaceans, Status of sharks, Ivory-billed woodpeckers, De-extinction</td>
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<tr>
<th>Date</th>
<th>Day(s)</th>
<th>Th: Conservation Laws</th>
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<tr>
<td></td>
<td></td>
<td>• Review major parts of ESA</td>
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<td>• Review major parts of CITES, other international agreements</td>
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<td></td>
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<td>• 3 Speed talks: ESA, CITES</td>
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<tr>
<th>Date</th>
<th>Day(s)</th>
<th>Th: Problems of Small Populations, PVA and MVPs</th>
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<tr>
<td></td>
<td></td>
<td>• Deterministic v. stochastic factors</td>
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<td></td>
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<td>• Genetics, demographic, environmental, catastrophic stochasticity</td>
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<td></td>
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<td>• What is PVA? What is MVP?</td>
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<tr>
<td>Date</td>
<td>Tuesday (T)</td>
<td>Thursday (Th)</td>
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<td>Feb 9, 11</td>
<td>Exam #1</td>
<td>Exercise #5: Lab Population Viability Analysis Paper Outline Due</td>
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<td>Feb no class 16, 18 (Th) (T = virtual M)</td>
<td>No Class</td>
<td>Discussion Utah Recovery Plans Species: Maguire Primose (A-G), Desert Milkvetch (H-M), Utah Valvata (N-R), Kanab Ambersnail (S-Z)</td>
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| Feb 23, 25    | Ecosystem Services | Reading: Armsworth et al. 2007 
- Ecosystem services connect people to conservation 
- Diversity-productivity 
- Diversity-stability |
| (T, Th)       |             | Work on Management Conservation Plan Evaluations in Class |
| Mar 1, 3      | Discussion of Ecosystem Services | Reading: Utah’s wolf management plan 
- What are novel ecosystems? What is re-wildling? 
- 1 Speed talk: Rewilding case study 
- Wolves as a case study |
| (T, Th)       |             | Draft Paper Due |
| Mar 7-11      | Spring Break |               |
| Mar 15, 17    | Establishing Protected Areas | Status of protected areas 
- Effectiveness of protected areas 
- 2 Speed talks: Marine parks, PADDD |
| (T, Th)       |             | Conservation Planning and Priorities 
- Establishing global priorities 
- Setting conservation targets, conservation measures 
- Start lab |
<p>| Mar 22, 24    | Exercise # 6: Lab Triage in Conservation Protection | Exam #2 |
| (T, Th)       |             |               |</p>
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<tr>
<th>Date</th>
<th>Time</th>
<th>Topic</th>
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<tr>
<td>Mar 29, Mar 31</td>
<td>T:</td>
<td>Discussion: How do we really do conservation?</td>
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<td>Mar 31 (T, Th)</td>
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<td>Reading: Pocewicz et al. 2011</td>
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<td>* Protection on privately owned lands</td>
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<td>* 2 Speed talks: Drones, History of activists</td>
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<td></td>
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<td>* Leandro’s speed talk</td>
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<td>Th:</td>
<td>Getting Practical about Introduced Species</td>
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<td></td>
<td></td>
<td>* What are invaders, terminology, and history of invasion ecology</td>
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<td>* Trends in numbers, transport vectors, Pathways, 10s rule</td>
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<td>* Exercise #7: colonization versus propagule pressure</td>
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<td>Apr 5, 7</td>
<td>T:</td>
<td>Presentations of Evaluations of Management Plans</td>
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<td>Apr 7 (T, Th)</td>
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<td>Th: Presentations of Evaluations of Management Plans?</td>
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<tr>
<td>Apr 12, 14</td>
<td>T:</td>
<td>Presentations of Evaluations of Management Plans</td>
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<td>Apr 14 (T, Th)</td>
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<td>Discussion: When should we be introducing/managing species?</td>
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<td>Th:</td>
<td>Why Do Non-natives Succeed?</td>
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<td></td>
<td></td>
<td>* Enemy release, Darwin’s hypos, other hypos</td>
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<td>* Genetics of invasions, plasticity, evolution, EICA</td>
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<td>* What are the real impacts of non-natives?</td>
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<td>Final Paper Due</td>
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<td>Apr 19, 21</td>
<td>T:</td>
<td>Discussion: Are non-native species all bad?</td>
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<td>Apr 21 (T, Th)</td>
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<td>Reading: Davis et al. 2011 and replies</td>
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<td>* 3 Speed talks: eDNA, Invasive herps, Lionfish</td>
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<td>* Investigating career opportunities</td>
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<td>Th:</td>
<td>Climate Change: Predicted and Measured Responses</td>
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<td>* Exercise #8: What types of responses do we expect to see by species?</td>
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<td>* What types of responses are we seeing?</td>
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<td>* Predictions of loss with climate change</td>
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<td>* Exercise #9: Cover letter and resume for one job</td>
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<td>Apr 26, 28</td>
<td>T:</td>
<td>Discussion: How do we mitigate impacts of climate change?</td>
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<td>Apr 28 (T, Th)</td>
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<td>Reading: Ricciardi and Simberloff 2009 and replies</td>
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<td>* What is assisted migration?</td>
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<td>* Do we expect climate change and invasives to interact?</td>
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<td>* Paris Climate Change Conference</td>
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<td>* Exercise #10: Peer edit of cover letter/resume</td>
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<td>Th:</td>
<td>Discussion New Conservation Science</td>
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<td>Reading: Soule 1985; Kareiva and Marvier 2012; Doak et al. 2014</td>
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<td>* 3 Speed talks: Clean energy, Keystone pipeline, BP Oil Spill</td>
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<td>May 5</td>
<td>Th: Exam #3  930-1120am</td>
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<tr>
<td></td>
<td>• What is the future of conservation biology?</td>
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<td>• Finish other topics we haven’t finished….review topics</td>
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