Prerequisites:
BOT 1404 or ZOOL 1604; SOIL 2124 preferred.

Objectives:
The objective of this course is to develop and apply critical thinking to conservation and land management issues through the application of ecological concepts and theory. Principles of population, community, ecosystem and landscape ecology will be taught through their application to wildlife management, fisheries management and land management that includes forests and rangelands. The course will focus on developing critical thinking through the application of the scientific method and literature to natural resource ecology and management. This class is part of the NREM core curriculum, taken by all NREM students. Thus, examples from forest and rangeland ecosystems, as well as habitats of certain aquatic and wildlife species will be used to illustrate ecological principles and how ecosystems and species can be managed for multiple uses, species diversity and natural resource sustainability.

How does this class relate to NREM options?
This class is part of the NREM core curriculum, taken by all NREM students. In particular, this class covers general ecological principles that are core to all of our disciplines.

- Forest Ecology and Management applies ecological principles to understand and manage forest lands for multiple uses. The general principles of ecology (See subsequent pages for details) and examples relevant to Oklahoma and beyond are taught in this course.
- Rangeland Ecology and Management applies ecological principles to understand and manage rangelands for multiple uses. The general principles of ecology (See subsequent pages for details) and examples relevant to Oklahoma and beyond are taught in this course.
- Fisheries and Aquatic Ecology applies ecological principles to understand and manage fisheries and aquatic ecosystems. The general principles of ecology (See subsequent pages for details) and examples relevant to Oklahoma and beyond are taught in this course.
- Wildlife Ecology and Management applies ecological principles to understand and manage fisheries and their habitats. The general principles of ecology (See subsequent pages for details) and examples relevant to Oklahoma and beyond are taught in this course.
- Wildlife Biology and Pre-veterinary Science is focused on animal biology which includes understanding the animal in their natural habitat. The general principles of ecology (See subsequent pages for details) and examples relevant to Oklahoma and beyond are taught in this course.

Class meeting:
This is a 3-hour course that meets twice weekly, Tuesday and Thursday at 1030-1145. It accompanied by a stand-alone laboratory course (NREM 3012). NREM 3013 can be taken without the laboratory.

Office Hours:
Appointments are best made through email @sam.fuhlendorf@okstate.edu. If you cannot reach me, the departmental secretary (Melissa Dunn) is at (744-5438).

Required Text
No specific text but periodic readings will be assigned throughout the semester that can be accessed through D2L. Any ecology book could help with the course (let me know if you need help selecting one - if you desire).

Drop Policy:
This course will follow university regulations for grade assignments corresponding to dropping courses within the respective weeks of the semester.

Class Attendance Policy:
Absences from class are either excused or unexcused. To receive an excused absence from lecture, place your name and calendar date of absence (month and day) on a slip of paper and give it to the instructor before the absence. Only in rare emergency situations (such as death in the family, serious illness, broken bones) will an excuse be accepted after the absence. Telephone excuses will be accepted in emergency situations.

Examination Schedule:
Examinations will cover lecture materials, discussions, as well as readings. Readings may or may not be discussed in class but you will be responsible for the material and it will be covered on exams.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>Tuesday, September 25</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Thursday, October 25</td>
</tr>
<tr>
<td>Exam 3</td>
<td>Tuesday, November 29</td>
</tr>
<tr>
<td>FINAL EXAM</td>
<td>Thursday December 13th, 10:00 – 11:50 am</td>
</tr>
<tr>
<td>Make-up examinations</td>
<td>Friday December 14th at 4:00-5:50 p.m</td>
</tr>
</tbody>
</table>

The tentative schedule of examinations shown here may be modified during the first two weeks of the semester, but not thereafter because of problems with coordinating schedules. Should a student miss a scheduled exam because of a schedule conflict arising after the second week of the semester, the student may elect to take a make-up exam.

Make-up examinations will be administered on Friday December 14th from 4:00 to 5:50 p.m., which is during finals week. These exams will be similar to other regular exams. No other times for make-up exams are available.

If you believe an exam question was scored incorrectly....
you may submit a written appeal within a week of the return of the exam. The appeal must be written and 1) identify the question, 2) give your preferred correct answer, 3) explain the basis for the appeal, and 4) give evidence that supports your appeal (i.e., quote from literature; include page number, or date and quote from a lecture). The marked exam must accompany the appeal materials. All of these materials must be turned in within one week from the day the exam was returned.

Personal Interview: Anyone with an examination score below 60% on the first examination must schedule an informal personal interview session with the instructor before the second examination is administered. Failure to schedule and attend a personal interview session may result in a loss of grade on the second examination. The purpose of this brief interview is to help the student resolve
problems experienced with the course and to improve the student's exam scores. **It is the responsibility of the student to schedule this meeting.**

**Grading:**
The following is a summary of the format for which the grade will be calculated for the course.

<table>
<thead>
<tr>
<th>Possible points</th>
<th>Extra credit</th>
<th>300 points</th>
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</thead>
<tbody>
<tr>
<td>&gt; 270 points</td>
<td>over 90%</td>
<td>A</td>
</tr>
<tr>
<td>240-269 points</td>
<td>80-89%</td>
<td>B</td>
</tr>
<tr>
<td>210-239 points</td>
<td>70-79%</td>
<td>C</td>
</tr>
<tr>
<td>180-209 points</td>
<td>60-69%</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 180 points</td>
<td>&lt; 60%</td>
<td>F</td>
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</table>

Three examinations and a final will be administered, with the lowest grade dropped in computation of the course grade. The remaining three exam scores will make up your entire grade. **Final exam will be comprehensive.**

**There will be no curve!!!**

**OUTLINE:**

1. **Introduction**
   - **Important Questions for this section:**
     a. What is ecology?
     b. What does it mean to make science-based decisions?
   - **Ecological Principles covered for this section**
     i. Scientific method
     ii. Guiding principles for science-based decisions
        1. Information available
        2. Quality of information- Peer-reviewed vs. non-peer reviewed literature
        3. Scaling up data
        4. Data-based conclusions vs. inferences
        5. Assumptions of the design and interpretation
        6. Exceptional conditions during the study

2. **Distribution of populations in space and time**
   - **Important Questions for this section:**
     a. What factors determine the distribution of plant and animal species?
     b. What factors contribute to the decline in bobwhite quail?
     c. What factors contribute to the decline in Lesser Prairie-chickens?
     d. How does understanding carrying capacity influence natural resource management?
     e. Why are woody plants increasing throughout the world?
     f. How does fire benefit some species?
   - **Ecological Principles covered for this section**
     i. What is habitat
     ii. Conditions and resources
     iii. Biomes and land types
iv. Ecological niches  
v. Disturbance  
vi. Importance of large scale patterns and fragmentation  
vii. Population models  
   1. Growth rates and reproduction  
   2. Classifications of species  
viii. Intraspecific competition  
ix. Density dependence/independence  
x. Human population dynamics  
xi. Grazing capacity  

3. Community and Ecosystem dynamics- interactions, biodiversity, disturbance and succession.  

**Important Questions for this section:**  
a. How effective is weed control for ecosystem management?  
b. How does hunting effect wildlife populations?  
c. Is predator control an effective way to manage wildlife species?  
d. From an ecosystem stand point, should we eat meat?  
e. Does biodiversity matter to ecosystem management?  
f. Why are there so many species?  
g. Can farmland be recovered as forest or prairie?  
h. Are ecosystems in balance with their environment?  
i. Can juniper woodland be recovered as prairie or oak woodland?  
j. How do we understand long term dynamics of ecosystems?  
k. What effects do fires have in the southern Great Plains?  
l. What is different about species extinctions that occurred through long history vs. those occurring today?  
m. What are the common causes of pollution?  

**Ecological Principles covered for this section**  
i. Native vs. Invasive species  
ii. Biodiversity  
iii. Competition  
iv. Other interactions  
v. Challenges in scaling up local studies  
vi. Predator prey relationships  
vii. Energy flow  
viii. Food webs  
ix. Trophic levels  
x. Direction vs. non-directional dynamics  
xi. Primary vs. secondary succession  
xi. Disturbance ecology  

4. Large scale conservation planning  

**Important Questions for this section:**  
a. Is climate change real?  
b. What happens when populations become isolated?  
c. How do we prioritize conservation issues in our region?  
d. How does managing vegetation influence the hydrologic and nutrient cycles?  
e. How do animals move across complex landscapes?  
f. What is the role of heterogeneity in conservation?
g. How can large scale conservation plans be developed for multiple objectives?

Ecological Principles covered for this section

i. Nutrient and water cycles
ii. Carbon Cycle/sequestration
iii. Climate change predictions
iv. Landscape ecology
v. Fragmentation
vi. Trade-offs in land use

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<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Special</th>
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<tr>
<td>August 21-23</td>
<td>Introduction</td>
<td></td>
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<tr>
<td>August 28-30</td>
<td>Natural History and Land Classification</td>
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<tr>
<td>Sept 4-6</td>
<td>Natural History and Land Classification</td>
<td></td>
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<tr>
<td>Sept 11-13</td>
<td>Individuals and Populations</td>
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<tr>
<td>Sept 18-20</td>
<td>Individuals and Populations</td>
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<tr>
<td>Sept 25-27</td>
<td>Communities and Ecosystems</td>
<td>Exam 1 Sept 25th</td>
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<tr>
<td>Oct 2-4</td>
<td>Communities and Ecosystems</td>
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<tr>
<td>Oct 9-11</td>
<td>Communities and Ecosystems</td>
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<tr>
<td>Oct 16-18</td>
<td>Communities and Ecosystems</td>
<td>October 19th Fall Break</td>
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<tr>
<td>Oct 23-25</td>
<td>Communities and Ecosystems</td>
<td>Exam 2 Oct 25th</td>
</tr>
<tr>
<td>Oct 30-Nov 1</td>
<td>Large Scale Ecology</td>
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<td>Nov 6-8</td>
<td>Large Scale Ecology</td>
<td>Friday, November 9 W Drop/Withdraw Deadline</td>
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<td>Nov 13-15</td>
<td>Large Scale Ecology</td>
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<tr>
<td>Nov 20-22</td>
<td>Large Scale Ecology</td>
<td>University Holiday – 11/22-11/23</td>
</tr>
<tr>
<td>Nov 27-29</td>
<td>Large scale conservation</td>
<td>Exam 3 Nov 29</td>
</tr>
<tr>
<td>Dec 4-6</td>
<td>Large Scale conservation</td>
<td>Pre-finals week</td>
</tr>
<tr>
<td>Tuesday Dec. 13th-10:00</td>
<td>FINAL</td>
<td>Thursday Dec. 13th 10:00 am</td>
</tr>
<tr>
<td>Friday, Dec. 14th, 4:00 pm</td>
<td>Make-up examination for excused absences</td>
<td>Friday, Dec. 14, 4:00 – 5:50 pm</td>
</tr>
</tbody>
</table>