

Course Syllabus

NRES 433/833 Wildlife Management Techniques

Fall 2011

Instructor:

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Course description:

Survey of quantitative techniques used in wildlife management. Scientific method of wildlife science; surveys; habitat use and classification; forensic methods; and population inventories. Introduction to the use of computer-based geographic information systems (GIS) in a natural resource context.

NOTE: the course uses a problem-based learning format.

Course location/time:

Lecture: TR 11:00-12:15 107 Hardin Hall, East Campus

Lab: Off-campus Excursion (see below)

Required Textbooks:

Braun, C. 2005. *Techniques for Wildlife Investigations and Management (6th edition)*. The Wildlife Society, Bethesda, MD.

Note: this book is available DIRECTLY from The Wildlife Society, and is available for a discount if you become a student member of TWS. The book is also available in the UNL Bookstore.

Leopold, A. 1949. *A Sand County Almanac and Sketches Here and There*. Oxford University Press, Oxford, UK (1989 edition).

Note: You are welcome to use another edition of this book, if you've purchased it for another course or personal reading.

Computer access, Room 162:

As a student in NRES 433/833, you will be given 24/7 access (with your NCARD) to Room 162. You will have access to computers, but not printers. If you want to print, you will need to set up an account with the SNR Computer Team (Jim Hines). For guest login, you may use:

username: snr-nres433
password: 433Student

Course Objectives:

By the end of this course, students should be able to:

1. Demonstrate the ability to apply concepts of experimental design and scientific method to solve management problems.
2. Solve management problems for abundant and threatened/endangered species using field and parameter estimation techniques for population analysis (animal capture/marketing, surveys, and aging and sexing).
3. Use traditional and adaptive techniques for population estimation and population analysis to manage abundant and threatened/endangered species.
4. Set defensible harvest regulations, and determine if harvest is sustainable for a population.
5. Determine appropriate uses of laboratory techniques for forensic analyses related to management and conservation.
6. Use animal movement data and quantitative methods to determine habitat preference.
7. Demonstrate basic fluency with Global Positioning Systems (GPS) and Geographical Information Systems (GIS) technology, in the context of solving management problems.
8. Incorporate habitat evaluation methods and vegetative sampling methods into analyses of grassland, wetland, forest, and agricultural habitats.
9. Develop a defensible habitat management plan.

This course will:

1. Provide a forum for discussion of new techniques in wildlife management.
2. Enable us to develop methods for solving problems in scientific teams.
3. Provide each student with a set of skills that may be used in applied situations as they begin careers in the field of wildlife management and conservation.

Why is this course an ACE 10 course?

This course fulfills the ACE 10 requirement for UNL's undergraduate general education program. The student learning objective, as designated by UNL, for ACE 10 courses is: *Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.*

NRES 433 fulfills the ACE 10 objectives through the following assignments:

Group assignment: Groups of 4 students are formed at random and asked to construct a management plan for habitat area. The plan integrates the current status of the habitat, the objectives of the resource agency (Game and Parks), and various alternatives to reach the objective(s). Then students are required to select one alternative, and provide details on management actions taken. The product requires that they satisfy the learning objectives that the class sets at the beginning of the problem case for the unit (What do we need to learn to solve this problem?). The groups present their plans, orally, to the class, and their classmates provide feedback on their plan.

Individual assignment: Students will turn in a 2-page written assignment: a NebraskaLAND magazine article. The students are challenged to take their group's management plan, and reduce it to 2 pages of text. The text must be written in a style that will attract a general reader, and they must convey information without jargon or other scientific terms that prohibit a general reader from understanding the issues. The goal of the article is to convince the general public that the agency's management actions are necessary, and that they are a good use of tax dollars. I perform the function of magazine editor, and allow students to rewrite the piece to improve their writing skills, following my initial edit.

ACE Assessment: UNL requires instructors of ACE courses to submit materials each year to confirm that students are meeting the objectives of the general education program's goals. Therefore, I will be providing the ACE coordinators with confidential information, including: (1) I will provide assessment on each group's management plan, and (2) I will also randomly select 5 student's individual assignments to assess as a representative sample of the class.

ACE components: *Each ACE course is required to provide opportunities for learning in specific areas. The following areas are covered by NRES 433:*

Writing

The individual assignment for the ACE learning objective is an excellent opportunity for students to continue their writing skill improvement. Students write and rewrite an article intended for the general public. The group assignment for the ACE learning objective is an opportunity to learn to write as a group. I structure this assignment so that each person is required to find resources and properly cite them in the style used in our field. There are also other individual assignments during the semester in which students are required to do research in scientific journals and summarize them, with appropriate citations. The objective is to continue to emphasize literature citation skills, as well as appropriate reference to the scientific literature when making decisions in wildlife management.

Historical Perspectives

We have readings during the semester from Aldo Leopold's 'A Sand County Almanac'. Students are required to submit reflection writings on each of the readings. The questions for students to ponder include questions regarding the history of wildlife management and how Leopold's proposals for management during the 1930's and 1940's differed from the current status of analyses and decision-making in our field.

Problem Solving

I use problem-based learning for the instruction of this course. Students are presented with 4 real-world problems, which form the basis of the course. They are asked what they need to learn to solve each problem, and are led through various means that wildlife managers use to solve problems.

Graduate students: Graduate students will be assessed using higher standards than undergraduate students, and will be expected to take on special leadership roles in the group exercises. Graduate students will be asked to give a short presentation during the semester relating to a topic of their interest.

Cheating/plagiarism: Please review Section 4 of UNL's Student Code of Conduct for definitions and warnings against cheating and plagiarism. UNL's policy on Academic Dishonesty states that a student may receive a sanction as severe as removal from a course with a failing grade for any type of Academic Dishonesty. My policy is: at the first detection of *cheating or plagiarism*, you will receive a failing grade on the assignment in question, and I will ask you to visit my office to discuss corrections to your work. Based on the case, I may also recommend a sanction beyond failing the assignment. If a second case occurs, you will be removed from the course with a failing grade. Remember that plagiarism goes beyond copying someone else's work "word-for-word". It includes using ideas without proper citation. It is essential, therefore, that you acknowledge the ideas of other scientists (including your classmates) in all of your written work and reports. Failing to properly cite ideas is as critical as copying your friend's homework. Why so strict? The intent of our Fisheries and Wildlife major is to produce honest, marketable students for the work place.

Attendance: Attendance is necessary to achieve a good grade in this course. In cases of deaths in the family or verified sickness (health center), I will allow you to reschedule a lecture

exam at the earliest possible time. However, you MUST notify me before the scheduled exam. Because of the nature of field trips, discussions (recitations), and computer laboratories, it is not possible to "make them up". For excused absences, I will allow you to use a partner's data, but you will only receive a maximum of a "3". Late learning reports will be accepted, but will receive a maximum of a "3". In general, when you choose to miss class, you choose to forfeit any points for assignments due at that time. See below for attendance requirements on the Sandhill Crane field trip.

Expectations: You will be expected to read the assigned readings in advance of each class period. This class uses 'student-centered' learning, which means you are responsible for finding much information--not simply relying on my mini-lectures. This will involve group meetings outside of class, as well as periods of individual library research. I will facilitate your group work through formation of Groups on Blackboard, and its use is encouraged. There may be occasions when you will need to complete a laboratory exercise on your own time. While all tests will be considered "comprehensive" (building on information gained earlier), each test (including the final) will focus primarily on the most recently-completed problem case.

Techniques Excursion: Our laboratory exercises will be held as one unit during a field excursion to Cedar Point Biological Station near Ogallala, NE. The excursion will be held during Fall Break, October 14-18 (Friday-Tuesday). During the excursion, we gather data for the habitat management plan, and you complete 40% of the homework assignments for the course. Thus, participation in the excursion is highly recommended. Excursion assignments cannot be made up—0 will be applied if they are not turned in. Students should not plan to drive to reach the destination (transportation will be provided). The Excursion is funded with the course fees you paid for this course, which will include your food and lodging at Cedar Point. No refunds are available for students opting to miss the excursion. Check your schedules early and reserve these dates! We will not hold on-campus laboratories during the rest of the semester.

Final Exam: This course's final exam is scheduled by the University. Our course is large, and there is no way to shift the exam to another time that will be suitable for all students. Please do not ask me to shift the time of the final exam for any reason. Seniors must take the final exam.

Animal care and use: To present proper techniques for mark-recapture and radio telemetry methods, it is necessary to use live animals in this course. You will be trained in the proper methods for care and use of animals in this course. The UNL Institutional Animal Care and Use Committee (IACUC) has approved the methods used--IACUC Permit #05-07-047D.

Additional help: Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Emergency procedures: Familiarize yourself with the emergency procedures posted in our classroom. For tornado, take the main stairway outside HARH 107 to the basement. For fire, we exit the building and gather at the north side of the Hardin Hall parking lot (by the prairie). In the event of a hostile intruder, the exits near the stage will lead outside if I instruct you to exit. Other circumstances may require us to secure the doors to this room. Double-doors at the entrance to HARH 107 require a latch to be secured in the middle of the double-door. In the event of any emergency, please listen to me for instructions.

NRES 433/833 Wildlife Management Techniques

Grading Model

Final Course Grade

A+	98-100%
A	90-97%
B+	88-89%
B	80-87%
C+	78-79%
C	70-77%
D+	68-69%
D	60-67%
F	<60%

Note: Fisheries and Wildlife majors, per requirements of their major, may not take this course as P/NP. Although UNL students implemented the current +/- grading system, I believe it unfairly penalizes students for "=" grades during calculations and interpretations of your GPA. To protect students from their poor policy, I do not give "-" grades and highly recommend repeal of the +/- grading system.

Calculation of Final Grades

Exams (2): 50% of final grade

Management plan: 25% of final grade (equal to 1 exam; group presentation: 40% of management plan grade, individual assignment: 60%)

Pass/Fail homework/assignments: 25% of final grade

(Note: excursion assignments make up approximately 40% of this assignment grade)

Example Calculation of Final Grade

Exam 1: 80%

Exam 2: 64%

Management Plan: 75%

Pass/Fail Homework average: 93%

$$\begin{aligned}\text{Final grade} &= (80 \cdot 0.25) + (64 \cdot 0.25) + (75 \cdot 0.25) + (93 \cdot 0.25) \\ &= 20 + 16 + 18.75 + 23.25 \\ &= \mathbf{78\%}\end{aligned}$$

Pass/Fail Homework

The following are general standards for grading of homework and laboratory exercises. For many assignments, you may be given standards that are specific to that assignment.

Grade received	Description of work required to obtain grade
4	<u>Impressive</u> . At least 90% of required answers or responses are correct on first submission. Answers are very detailed, very complete, and show evidence of advanced critical thinking. All questions are answered. Very few, if any errors in grammar or spelling. High amount of effort expended to complete the assignment.
3	<u>Proficient</u> . At least 80% of required answers or responses are correct. Answers are detailed, complete, and show evidence of critical thinking. All questions answered. Very few errors in grammar or spelling. Assignment is complete and adequate, but not exceptional.
2	<u>Limited</u> . At least 60% of required answers or responses are correct. Answers are not as detailed as required to show evidence of critical thinking. May not have provided answers for all questions. Contain some errors in grammar or spelling. <i>To encourage learning, you may correct errors and resubmit within 1 week (highest grade on re-submittal is a "3").</i>
1	<u>Attempted</u> . Assignment was turned in, but less than 60% of required answers or responses were correct. May not have provided answers for all questions. Contain many errors in grammar or spelling. <i>To encourage learning, you may correct errors and resubmit within 1 week (highest grade on re-submittal is a "3").</i>
0	<u>Fail</u> . Did not complete the assignment. Either absent (unexcused) from class or assignment not received by due date. <i>No resubmissions possible.</i>

Your overall homework assignment grade will be the average of all homework/assignment scores, scaled to a percentage score as follows:

Average score	%	Average score	%	Average score	%	Average score	%
4.0=	100	3.0=	85	2.0=	75	1.0=	65
3.9=	98	2.9=	84	1.9=	74	0.9=	64
3.8=	96	2.8=	83	1.8=	73	0.8=	63
3.7=	94	2.7=	82	1.7=	72	0.7=	62
3.6=	92	2.6=	81	1.6=	71	0.6=	61
3.5=	90	2.5=	80	1.5=	70	0.5=	60
3.4=	89	2.4=	79	1.4=	69	0.4=	59
3.3=	88	2.3=	78	1.3=	68	0.3=	58
3.2=	87	2.2=	77	1.2=	67	0.2=	57
3.1=	86	2.1=	76	1.1=	66	0.1=	56

NRES 433/833 Wildlife Management Techniques TENTATIVE COURSE SCHEDULE

Date	Lecture/Activity	Reading Assignment
Aug. 23	Course introduction, syllabus Experimental design: Fox squirrel survey and mark-recapture case Intro to PBL, learning issues determination	Syllabus Experimental design case study materials (in class)
25	Research methods I: scientific method and management Research methods II: hypothesis testing versus model selection (AIC) and management questions --Leopold discussion	Braun: Ch. 3 Assignment due: Leopold's Sand County Almanac, " <i>January</i> "
30	Counting wildlife: accounting for incomplete detectability --discussion of surveys for fox squirrels on East Campus	Braun: Ch. 5 (pp. 106-130)
Sept. 1	Conduct fox squirrel point surveys on East Campus; Distance and Double-Observer methods	Field exercise
6	Capture/recapture field techniques: trapping and marking methods	Braun: Ch. 10 & 13 Assignment given: marking/capture methods and citations
8	Radio telemetry theory (in preparation for Excursion)	Braun: Ch. 14
13	Double observer and Distance survey theory	Braun: Ch. 5 (pp. 120-127)
15	Capture/recapture theory I (closed populations)	Braun: Ch. 5 (pp. 127-146) In-class assignment: MR 'by hand' calculations
20	Capture/recapture theory II (open populations) --Leopold Discussion	Assignment due: Leopold's Sand County Almanac, " <i>December: 65290</i> "
22	Exam 1	
27	Habitat management and habitat preference: Field site problem case	Problem case study materials (in class)

	Learning issues determination	
29	Background on management plans--what is a "management plan?"	Braun: Ch. 19
Oct. 4	Habitat suitability models, functional assessment models --Leopold discussion	Braun: Ch. 18 Assignment due: Leopold's Sand County Almanac, "November"
6	In-class work day, preparing assessment models for field site	Braun: Ch. 29-34 Assignment: <i>you may be given a personal or group assignment in preparation for the logistics of the Excursion</i>
11	Home range theory and estimation --Leopold discussion	Braun: Ch. 14 (pp. 395-406) Assignment due: Leopold's Sand County Almanac, "December: Home range"
13	DISCUSSION DAY: telemetry effects on animal behavior, reproduction, and survival --Selecting the proper radio transmitter	Abstracts from studies on telemetry effects (provided in-class)
14-18	Off-campus excursion topics/activities: <ul style="list-style-type: none"> • Mark-recapture methods (mist netting, box traps, float traps, pit fall traps, camera traps) • Computer analysis of survey data • Aging wildlife and use of age data (Aging prairie chickens and deer) • Radio-telemetry, bearing calculations • Home range data collection (box turtles), computer analyses • Habitat evaluation and assessment methods; data collection • Harvest management field trip 	Tentative schedule: leave Friday (14 th) in early afternoon, activities on Saturday-Monday, leave field site on Tuesday morning to return to Lincoln Tuesday afternoon (4pm approx ETA).
18	FALL BREAK: Return to Lincoln from Techniques Excursion	
20	In-class work day for groups--developing management plans (review data, identify management needs)	
25	In-class work day for groups--developing management plans (establish plan, integrate data)	

27	In-class work day on group report.	
Nov. 1	Targeting audiences for outreach: marketing and science --Guest lecture: Karie Decker, MS (Coordinator, Nebraska Invasive Species Program)	<u>Group management plan due (40% of Exam 2).</u>
3	Mini-lecture on individual report.	<u>Assignment given:</u> individual report for wetland problem case (individual report due at 5:00 pm on Nov. 11th: 60% of Exam 2)
8	Determining wildlife habitat preference	Braun: Ch. 17 (pp. 465-478) Assignment given: Habitat preference calculations (skunk data)
10	Harvest management case: Nebraska's prairie chickens --learning issue determination --theoretical ARM GPCH model development (what makes GPCH populations go up and down, and how might harvest affect that?)	Problem case materials (in class) Individual report due: 5pm
15	Introduction to harvest management	Braun: Ch. 25 (skim Ch. 6 for background on population dynamics)
17	Harvest management II: Adaptive Resource Management and structured decision-making in harvest management --Leopold discussion	BB: Adaptive Harvest Management: USFWS Hunting Season Report BB: DOI Adaptive Management Technical Guide Leopold's Sand County Almanac, "October" Assignment given: Computer simulation of harvest dynamics, harvest models
22	Harvest surveys: constructing and analyzing a survey of people	Assignment given: survey to take home over Thanksgiving
24	THANKSGIVING: NO CLASS	
29	Harvest regulations and "town hall" meeting for Adaptive Management Decision	

	Evaluations	
Dec. 1	Harvest management III: forensic methods for law enforcement	Braun: Ch. 25 (pp. 673-674)
6	NO CLASS	Midwest F&W Conference, Des Moines (Dec. 4-7)
8	Wrap up topics; review for Final Exam	
Dec. 12	Final Exam: Monday, Dec. 12, 10:00am to 12:00 noon	