

TEACHING WILDLIFE DAMAGE MANAGEMENT THROUGH SERVICE-LEARNING

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Abstract: As human-wildlife conflicts in South Carolina continue to increase, it became evident that students in the natural resource majors at Clemson University were not receiving the proper training and exposure to wildlife damage issues and management. To address this need, an undergraduate and graduate course was developed to expose students to various techniques used to reduce human-wildlife conflicts. Other topic areas included the philosophical, sociological, ecological and economic basis for controlling damage caused by individual animals or populations of problem wildlife. The course involves a high degree of service-learning addressing human-wildlife conflict issues in South Carolina.

Key words: curricula, human-wildlife conflicts, training, wildlife damage management

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INTRODUCTION

Like most areas of the country, South Carolina is experiencing an increase in the number of human-wildlife conflicts. Part of the problem can be attributed to the rapid rate of development in the state, and the conversion of wildlife habitat into suburban and urban areas. In many cases, the interface of developed areas and wildlife habitat has created an increase in the number and complexity of human-wildlife conflicts. As these conflicts have increased, it has become evident that wildlife biologists and natural resource professionals lack the necessary training and expertise to effectively address and resolve current and emerging human-wildlife conflict issues. As a result, Clemson University began developing a course to train undergraduate and graduate students enrolled in our natural resources curriculum in the area of wildlife damage management. Planning and development of the course

began in 1997. The first course was taught during the fall semester of 1998.

COURSE COMPONENTS

During the planning and development phase of the course, existing courses being taught at other universities were reviewed. Several universities had well-developed course(s) or curricula that were valuable in developing the course at Clemson University. Some of these universities included The Berryman Institute at Utah State University, the University of Nebraska, Cornell University and the University of Georgia. The Clemson course was structured as a 3-hour credit lecture course, with an optional 1-hour credit lab. Students were strongly encouraged to take both the 3-hour lecture and 1-hour lab. The required text for the course was *Prevention and Control of Wildlife Damage*, editors S.E. Hygnstrom, R.M. Timm, and G. E.

Larson, 1994, Cooperative Extension, University of Nebraska, Lincoln.

Specific components of the Clemson University course can be found in Appendix 1. The course objectives were the following:

- To develop an understanding of society's beliefs and values toward wildlife, and how these values affect human behavior and tolerance of wildlife.
- To understand the impact (economic, social, and ecological) of wildlife damage in South Carolina and the U.S., and the role that wildlife damage management plays in reducing and preventing human-wildlife conflicts.
- To have a thorough knowledge of the components of a wildlife damage management program which includes 1) problem definition, 2) ecology of the problem species, 3) approaches and techniques for resolving human-wildlife conflicts, and 4) evaluation of techniques used to reduce human-wildlife conflicts.

A strong component of the course centers on service-learning. Students were required to become involved in resolving actual human-wildlife conflicts in South Carolina. This "learning by doing" experience was an invaluable part of the course. Conflicts and issues were identified for students from lists compiled in advance by Extension agents, South Carolina Department of Natural Resource biologists, and personnel with USDA Wildlife Services. Students were required to work with various individuals and groups that were experiencing wildlife damage problems and develop a wildlife damage management plan (case study) to address and resolve human-wildlife conflicts. Plans were presented to those experiencing

wildlife problems and also to the entire class.

Students were also required to develop and deliver educational outreach and training programs in wildlife damage management to various stakeholder groups in South Carolina. In preparing for their presentations, students were able to research in-depth the problems and potential solutions to resolving conflicts with a particular species. In addition, students were able to interact with various stakeholders, understand their concerns and problems, and help address concerns by offering potential solutions. The course also involved a high degree of student interaction with federal and state agency professionals, as well as private nuisance wildlife control operators (NWCs), who work directly with individuals and communities experiencing wildlife problems.

COMMENTS AND RECOMMENDATIONS

Since the course was first taught in 1998, five successive wildlife damage management courses have been taught at Clemson University. Course evaluations revealed that students appreciated the "hands-on" and service-learning portion of the course. Specifically, students valued the exposure to current issues in human-wildlife conflicts, the high interaction with wildlife damage management professionals, and the interaction with various stakeholders affected by wildlife problems. The course was also valuable in that it introduced students to a relatively new and growing field that offered potential employment opportunities. After graduation, several students became employed in the wildlife damage management field with either government agencies or private companies.

University and natural resource departments interested in developing a wildlife damage management course would

be well-served to review existing courses being taught at other universities. New course syllabus could be developed using a combination of topics and techniques being taught at other universities. Time would be well spent visiting with course instructors and faculty at other universities discussing what worked well in class or lab, and topics or areas to avoid. Once a well developed course outline has been put together, outside resource experts (USDA Wildlife Services, state wildlife agency professionals, NWCOS, extension agents, etc.) should be contacted well in advance to schedule field trips, case study exercises, and guest lectures. If the course involves handling of wildlife, or exposure of students to wildlife in lab or field settings, animal research committees in charge of the university's compliance to the Animal Welfare Act should be contacted. In

most cases, these committees require a protocol and approval of all activities related to animal handling and student exposure to animals.

The wildlife damage management course at Clemson University has added a needed component to the natural resource curriculum. Currently, the course is an elective; but, as the course evolves and human-wildlife conflicts increase, the course may well become a requirement. Other universities should consider adding a wildlife damage management component to existing courses or create a stand alone course. This not only offers potential career opportunities for students, it also ensures that graduates have the knowledge and problem-solving skills to adequately address one of the fastest growing areas in the wildlife and natural resource profession.

**Appendix 1. Course syllabus for WFB 493/861
Wildlife damage management**

Course Syllabus

- Course Number: WFB 493, Section 03, for undergraduate students
WFB 861, Section 03, for graduate students
- Course Credits: 3 hour lecture, 1 hour lab
- Course Time and Date: Wednesday, Friday 8:00-8:50 am, Room 135 Lehotsky Hall
Friday 2:30 - 6:20 p.m., Room 135 Lehotsky Hall
Field Trips will be announced in advance
- Course Instructors: Dr. Greg Yarrow - 272 F Lehotsky Hall
Phone: 656-7370
E-Mail: gyarrow@clemsn.edu
- Dr. Rickie Davis - 250 Lehotsky Hall
Phone: 656-0179
E-Mail: jrdvs@clemsn.edu
- Office Hours: Feel free to drop in whenever you wish; however, if you need to see one of us it is best to set up an appointment.
- Textbook: Prevention and Control of Wildlife Damage; Scott E. Hygnstrom, Robert M. Timm, and Gary E. Larson, editors. Cost is \$45.00.

Course Description: This course will cover the philosophical, sociological, ecological, economical basis for controlling damage caused by individual animals or populations of problem wildlife species. Special emphases will be placed on the fundamentals of prevention and control of damage caused by vertebrate species, especially mammals and birds. The course will involve a high degree of interaction with federal and state agencies, as well as private consultants, who work directly in controlling problem wildlife species.

Calendar of Events

Day	Topic	Exams/Reports
August 18	Class Orientation	
August 20	Principles and Philosophy of Wildlife Damage Management	
August 25	Role of State and Federal Agencies and Private Consultants	
August 27	Health, Safety, Regulations, and Animal Welfare Concerns	
September 1	Control Methods - Non-Lethal	
September 3	Control Methods - Lethal (lecture & field trip)	
September 8	Exam I	Exam I
September 10	Public Relations and Wildlife Damage Management	

Appendix 1 (Continued)

September 15	Written Literature Review I Due and Presentations	Lit. Review I Due
September 17	Rodents (mice, rats, voles)/(lecture & field trip)	
September 22	Literature Review I Presentations (continued)	
September 24	Rodents (beaver)/(lecture & field trip)	
September 29	Rodents (squirrels, chipmunks and groundhogs)	
October 1	Interspecies / Exotics Interactions & Competition	
October 6	Carnivores (black bear, feral cats, feral dogs)	
October 8	Field Trip (Savannah and Hilton Head)	
October 13	Other Mammals (bats)	
October 15	Other Mammals (deer)	
October 20	Exam II	Exam II
October 22	Written Literature Review II Due and Presentations	Lit. Review II Due
October 27	Literature Review Presentations II (continued)	
October 29	Other Mammals (moles, opossums, rabbits)	
November 3	Birds (geese, woodpeckers, aquaculture pests)	
November 5	Birds (blackbirds, crows, sparrows, starlings, pigeons, vultures, raptors)	
November 10	Reptiles (alligators)	
November 12	Reptiles /Amphibians (snakes, frogs and toads, salamanders, and turtles)	
November 17	Exam III	Exam III
November 19	Owning and Running a Nuisance Wildlife Control Business	
November 24, 26	Thanksgiving Holiday	
November 29	In-service training presentations	
December 1	Written Graduate Student Case Studies Due and Case Study Presentations	Graduate Case Studies Due
December 3	Course Review for Final Exam	Course Review
December 8	Final Exam	Final Exam

- Any last minute changes in class will be announced by e-mail. Check your e-mail regularly.

COURSE REQUIREMENTS

Attendance

Attendance is mandatory for each class period unless pre-approved in advance by the instructors or because of sickness or injury (written medical excuse required). Students are allowed one unexcused absence. For each unapproved absence after the first unexcused absence, five points will be deducted from the final grade. You will be responsible for information given in class

while you were absent. This includes changes in test schedules. It is your responsibility to obtain this information from someone who attended class. You may leave after 15 minutes if the instructor is not in class.

Literature Reviews

Two technical literature reviews will be required for the course. For each review

Appendix 1 (Continued)

you will read a paper that deals with some aspect of wildlife damage management. You will write a one-paragraph summary and a one-paragraph critique of each (typed, double spaced, two-page maximum please). The summary should be a brief account of the major objectives and findings of the paper. The critique should be a more extensive analysis of the paper - an exercise in critical thinking. What were its strong and weak points? Did it make any sense? How would you improve it? Be creative, these exercises are intended to help you become familiar with the wildlife damage literature and help expand your horizons. You will also present your literature review to the entire class following the written format. Points will be assigned for both written and oral literature reviews for brevity of summary, and quality of the critique (both written and oral), writing, and proof-reading. Sources for technical papers include:

- 1) Proceedings of the Eastern Wildlife Damage Management Conference
- 2) Proceedings of the Great Plains Wildlife Damage Control Conference
- 3) Proceedings of the Urban Pest Management Conference
- 4) The Wildlife Society Bulletin
- 5) The Journal of Wildlife Management
- 6) Proceedings of the Southeastern Association of Fish and Wildlife Agencies Conference
- 7) The Internet Center for Wildlife Damage Management (www.ianr.unl.edu/wildlife/)

Each literature review will be worth a total of 25 points. Written and oral reviews count 12.5 points each. *All journal articles and topics must be approved by Dr. Davis/Yarrow in advance.*

Exams

Exams I, II, and III will cover only the material presented in the course up to that Exam day and only topics between each Exam. The Final Exam will be comprehensive. We will hold an optional review session before each exam to brush up on details and answer your questions. Exam I, II, and III are worth 50 points apiece and the Final Exam is worth 150 points.

Case Study (Graduate Students Only)

Graduate students are required to develop a wildlife damage program (plan) for a real life problem in South Carolina. Case studies will be assigned to graduate students by the instructors. The plan will be presented both orally and in a written format to individuals or groups experiencing wildlife damage. Case studies will also be presented to the class during the last week of scheduled classes. Case studies will be evaluated based upon creativity, practicality and applicability, and quality of written and oral presentations. The case study is worth 100 points.

Field Work

Although this course does not require a lab, limited field experience will be integrated into the teaching portion of the course. Because of the close proximity to campus, Clemson's forests, agricultural lands, and aquaculture ponds, will be used as field sites to illustrate various trapping techniques and other control techniques for problem wildlife. Students will be required to attend two field excursions. Other field excursions will also be offered and are optional, but students are highly encouraged to attend. Students will be evaluated based upon attendance and the ability to understand and implement control

Appendix 1 (continued)

techniques in the field. Each field excursion is worth 25 points.

In-Service Training Presentation

On Monday, November 29th graduate students will be required to make a professional presentation at a wildlife damage management in-service/continuing education training for county extension agents and SCDNR conservation law enforcement officers. Since this is not a regular class day, each student must make arrangements in-advance to miss previously scheduled classes/events on this day. Each presentation must consist of a detailed description of the biology of the nuisance animal, what types of problems it can cause, and a thorough explanation of the pros and cons of all available control techniques. Presentations must have high quality visuals (A/V) and support equipment (traps, repellents, etc.) if appropriate. The in-service training will be all day at the Sandhills Research and Education Center outside of Columbia, SC. Plan on leaving in

COURSE EVALUATION SUMMARY

a university van to Columbia on Sunday afternoon. We will return to Clemson Monday evening. Lodging will be provided at a local hotel. Presentations are worth 50 points and will be graded based upon content and quality. Undergraduates who are interested in extra credit points may also make a presentation at the in-service training but must give their intent to do so by November 1.

Grading Procedure

Your work in the course will be evaluated by the distribution of points listed below. The schedule of exams, literature reviews, case studies (graduate students only), and final exam are listed above in the calendar of events. Make-up exams, literature reviews, and final exams will only be given to students with VALID excuses received BEFORE THE EXAMINATION DATE. Questions about the exams and literature reviews will be entertained for only a one-week period after the exams and literature reviews are returned to class.

Exam I	50 points
Exam II	50 points
Literature Review I	25 points (12.5 points written, 12.5 points oral)
Literature Review II	25 points (12.5 points written, 12.5 points oral)
Exam III	50 points
Field Excursion I	25 points
Field Excursion II	25 points
In-service training presentation	50 points (required for graduate students, extra credit for undergraduates)
Case Study (graduate students only)	100 points (50 points written, 50 points oral)
Final Exam	150 points
Undergraduate Student Total Points	400 points
Graduate Student Total Points	550 points

Appendix 1 (Continued)

Grades will be based on the following point scale:

<u>Undergraduate Students</u>		<u>Graduate Students</u>	
A	360 - 400		500 - 550
B	320 - 359		450 - 499
C	280 - 319		400 - 449
D	240 - 279		350 - 399
F	≤ 239		≤ 349
