Biology and Conservation of Southern Appalachian Mammals

Instructor Information

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Course Description

This course is on the biology of mammals of the Southern Appalachian Mountains. We will combine experience from laboratories, lectures, and field work. Students are expected to learn the defining characteristics of selected mammalian Orders and Families in the Southern Appalachians. We will also focus on major aspects of mammalian ecology, including reproduction, population ecology, and physiology using common field and analytical techniques.

Required and Suggested Texts

Required: *Mammals of Great Smoky Mountains National Park*, 3rd ed. by Donald Linzey

Suggested: *Peterson Field Guide to Mammals of North America* By Fiona Reid

Required Equipment

Students should come prepared for variable summer weather in the Smoky Mountains, which can include heat, humidity, rain, and cool mornings. Because fieldwork can be wet or muddy, students may wish to pack an extra pair of socks and shoes. Clothing should be durable, comfortable, and appropriate for extended outdoor activity in rugged terrain. I recommend the following:

- Sturdy, closed-toe hiking boots or trail shoes are required
- Long pants and breathable shirts to protect against insects and vegetation
- A waterproof rain jacket
- A hat to protect from the summer
- Top layers as it may be chilly in the evenings and morning
- Refillable water bottle, sunscreen, and insect repellent
- A backpack to carry daily essentials
- A headlamp or flashlight
- A notebook and writing utensils
- Binoculars (recommended)
- Textbooks, field guides

Assignments and Assessment

The following scale will be used to assign your final course grade: A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = below 60%. Your grade will be determined by the following assessment materials:

Grade Item	Point Distribution	Due Date
Specimen ID worksheets	100 points (4 x 25 points each)	In class
Lab practical	100 points	July 11, 2026
Lecture exam	100 points	July 17, 2026
Species profile paper	50 points	July 16, 2026
Species profile presentation	50 points	July 16, 2026

Species Profiles

In this assignment, students will research and write a 3-page species profile on a *non-charismatic* mammal native to the Southern Appalachian Mountains and then present it to the class. The goal is to highlight the ecological importance, adaptations, and conservation needs of a lesser-known mammal that typically receives little public attention compared to more popular species (e.g., black bears, white-tailed deer).

Species paper

Papers should be 3 double-spaced pages,12-point font, and 1-inch margins. Minimum of 5 peer-reviewed journal articles/books should be used as sources, and citations should follow a consistent scientific style (e.g., Mammalian Biology format). The paper structure should include:

- **Introduction:**
    - Briefly introduce the species, providing a short overview of its geographic range, emphasizing its presence in the Southern Appalachians
- **Natural history:**
    - Describe identifying characteristics (size, morphology, features)
    - Summarize habitat preferences, diet, activity, and reproductive behavior
    - Discuss ecological roles (e.g., seed disperser, prey item, soil aerator, etc.)
- **Conservation and management:**
    - Identify major threats (habitat loss, climate change, disease, invasives)
    - Describe current conservation status and any relevant protections
    - Highlight management actions being taken to protect the species
- **Conclusion:**
    - Summarize key findings and reflect on why this species deserves greater recognition or conservation attention

Species presentation

Each student will deliver a 10-minute presentation summarizing the key aspects of their species' biology, ecology, and conservation. Presentations should include clear visuals (e.g., slides or photos) that help illustrate identifying features, habitat, and distribution. Students should highlight why their species is considered non-charismatic, its ecological role within Appalachian ecosystems, and any major conservation concerns or management efforts. The goal of this presentation is to effectively communicate scientific information to peers in an engaging and accessible way, demonstrating both content knowledge and oral communication skills. Presentations will be graded on accuracy, clarity, visual organization, and delivery.

Grading rubrics

Species profile paper

Category	Points	Description
Scientific content	15	Demonstrates a clear understanding of the species' biology, ecology, and conservation; all information is accurate and well-researched.
Organization	10	Writing is well-organized with clear sections (introduction, natural history, conservation, conclusion); transitions are smooth and logical.
Use of citations	10	At least 5 credible references used (including 2 peer-reviewed); citations formatted consistently and correctly.
Critical thinking	10	Effectively discusses ecological roles and conservation relevance; shows thoughtful reflection on the species' importance.
Formatting	5	Paper is free of grammatical errors, follows formatting guidelines (3 pages, 12-pt font, 1-inch margins).

Species profile presentation

Category	Points	Description
Scientific content	15	Clearly presents the species' natural history, ecology, and conservation issues with accurate, relevant information.
Organization	10	Presentation has a logical structure (intro, main points, conclusion); time is used effectively (5–7 minutes).
Visual quality	10	Slides or visuals are clear, well-designed, and enhance understanding of the topic (e.g., photos, maps, diagrams).

Category	Points	Description
Delivery & engagement	10	Speaker is confident, clear, and engaging; maintains eye contact and explains concepts effectively.
Professionalism	5	Presentation is polished, within time limits, and shows evidence of preparation and rehearsal.

Preliminary Schedule

Day	Time	Activity	Topic
July 6	8-10am	Lab	Set up Sherman live trapping grids, track plates, cameras, bat acoustic sensors
July 6	10-12pm	Lecture	What makes a mammal a mammal?
July 6	2-4pm	Lab	Skull, dental characteristics & basic anatomy terms
July 6	4-5pm	Lab	Set traps
July 7	8-10am	Lab	Check traps & track plates and process any specimens
July 7	10-12pm	Lecture	Rodentia & Lagomorpha
July 7	2-4pm	Lab	Skulls, skins (Rodentia & Lagomorpha)
July 7	4-5pm	Lab	Set traps
July 8	8-10am	Lab	Check traps & track plates and process any specimens
July 8	10-12pm	Lecture	Chiroptera & Eulipotyphla
July 8	2-4pm	Lab	Skulls, skins (Chiroptera & Eulipotyphla)
July 8	4-5pm	Lab	Set traps (potentially trap bats!)
July 9	8-10am	Lab	Check traps & track plates and process any specimens
July 9	10-12pm	Lecture	Carnivora
July 9	2-4pm	Lab	Skulls, skins (Carnivora)
July 9	4-5pm	Lab	Set traps (potentially trap bats!)
July 10	8-10am	Lab	Check traps & track plates and process any specimens
July 10	10-12pm	Lecture	Artiodactyla
July 10	2-4pm	Lab	Skulls, skins (Artiodactyla)
July 10	4-5pm	Lab	Set traps (potentially trap bats!)
July 11	8-10am	Lab	Check traps & track plates and process any specimens
July 11	10-12pm	Lecture	Metabolism/thermoregulation
July 11	2-4pm	Lab	Lab practical exam (skulls & skins)
July 11	4-5pm	Lab	Set traps (potentially trap bats!)
July 12	8-10am	Lab	Check traps & track plates and process any specimens
July 12	10-12pm	Lecture	Digestion & foraging behavior
July 12	2-4pm	Lab	Optimal foraging theory
July 12	4-5pm	Lab	Set traps (potentially trap bats!)
July 13	8-10am	Lab	Check traps & track plates and process any specimens
July 13	10-12pm	Lecture	Movement and spatial relationships
July 13	2-4pm	Lab	Radio telemetry
July 13	4-5pm	Lab	Set traps (potentially trap bats!)
July 14	8-10am	Lab	Check traps & track plates and process any specimens
July 14	10-12pm	Lecture	Mammalian reproduction
July 14	2-4pm	Lab	Research time
July 14	4-5pm	Lab	Set traps
July 15	8-10am	Lab	Check traps & track plates and process any specimens
July 15	10-12pm	Lecture	Mammal diversity & conservation
July 15	2-4pm	Lab	Camera trap & track plate diversity analyses
July 15	4-5pm	Lab	Set traps
July 16	8-10am	Lab	Check traps and process any specimens
July 16	10-12pm	Lecture	Population ecology
July 16	2-4pm	Lab	Mark-recapture analyses
July 16	4-5pm	Lab	Presentations
July 17	8-10am	Lab	Check traps and clean traps
July 17	10-12pm	Lecture	Lecture Exam