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Feeding Ecology of Animals

July 14-26, 2026

Dr. Suzanne Nelson
Suzanneecology@gmail.com

Introduction: This class will examine how animals in the wild meet their nutritional needs while foraging within the landscape. We will examine how they obtain the nutrients they need to support living and reproduction, and what challenges they face in finding those resources. Through lecture, interactive paper discussion, field techniques, and field trips, students will learn how wildlife find and contribute nutrients to the areas they forage in to meet their nutritional needs. A central focus of this class is research design. Students will design several experiments to test nutritional concepts.

Textbook:
There is no textbook for this class. Instead, we will be reading the most current literature on this topic based on journal articles discussed in class.

Grade breakdown:

Be the Animal presentation	20 points
Tonkins presentation	15 points
Research project	40 points
Final Exam (take home)	45 points
Participation	30 points
Total points possible:	150 points

Attendance Policy: You are expected to be at every class. Because of the small size of the course and a strong emphasis on teamwork, your absence will be a detriment to your group and will be noticed. However, if you have an unforeseen circumstance, please keep me informed and we can work on a plan together.

Grades: 1

	A = 94-100%	C = 73-76.9%
	A- = 90-93.9%	C- = 70-72.9%
	B+ = 87-89.9%	D+ = 67-69.9%
	B = 83-86.9%	D = 63-66.9%
	B- = 80-82.9%	D- = 60-62.9%
	C+ = 77-79.9%	F = < 60%

All papers are available on Google Scholar or on a flash drive from Dr. Nelson. All Powerpoint lecture notes are available to you for the final exam.

Classroom policies:
You are expected to be in class and on time. If you miss the vehicle when it leaves in the morning, you will be left behind for the day

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At the end of each project, you will be sent a sheet to review your group members for their participation. Their input will greatly influence your final grade for participation in the class. You will be evaluated for each separate project.

Clothing:
At least half of each day we will be spending in the field site and outside. You will need shoes/boots for hiking, a rain jacket, water, food, sunscreen, sunglasses, and warmer clothing with you at all times, as weather can change quickly at high altitude. Shoes must be closed-toes and a long sleeve shirt and field pants are recommended.

Week 1

July 14 (Tuesday) Introduction and Nutritional Ecology
Morning: Welcome to the MRS and class introductions, what this class is like, review the syllabus, tour the four available field sites (Mudlake, Sourdough, Beartown, upper MRS)
Afternoon: Lecture on how to read a scientific paper/what is nutritional ecology, Read and discuss Paper #1, Assign groups for Be the Animal

July 15 (Wednesday) Macronutrients: Protein, Fat, and Carbohydrates
Morning: Field work (Be the Animal)
Afternoon: Lecture on protein/fat/carbohydrates/fiber, Discuss paper #2, presentation on deer of the Virgin Islands

July 16 (Thursday) Micronutrients: Minerals and Vitamins
Morning: Field work (Be the Animal)
Afternoon: Lecture on minerals/vitamins, Discuss paper #3, presentation on fruit bats of American Samoa

July 17 (Friday) Optimal Foraging and Nutritional Choice
Morning: Field work (Be the Animal)
Afternoon: Presentations on Be the Animal, lecture on OFT/nutritional wisdom, Discuss paper #4

July 18 (Saturday) Methods in Nutritional Ecology
Morning: Field work (observations/hypothesis worksheet)
Afternoon: Lecture on methods in nutritional ecology, organize groups for big research project/ ideas on board, presentation on Tonkins snub-nosed monkeys, Tonkins assignment given out

Week 2

July 20 (Monday) Nutritional Deficiencies in Wildlife
Morning: Field work (Research topics)
Afternoon: work on the Tonkins assignment, lecture on nutritional deficiencies and climate change, discuss paper #5

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July 21 (Tuesday) Specialists and Generalists
Morning: Field work (Research topics)
Afternoon: Student presentations on Tonkins, lecture on specialists/generalists, discuss paper #6

July 22 (Wednesday) Alternative Food Choices
Morning: Field work (Research topics)
Afternoon: Lecture on prey switching/novel/famine foods, discuss paper #7 and presentation on marbled murrelets

July 23 (Thursday) Pregnancy and Lactation
Morning: Field work (Research topics)
Afternoon: Lecture on pregnancy/lactation/delayed implantation and discuss paper #8, work on presentations

July 24 (Friday) Hibernation and Torpor
Morning: Field work (Research topics)
Afternoon: Lecture on hibernation/torpor and discuss paper #9, work on presentations

July 25- Saturday Final wrap up
Morning: Field work or work on presentations
Afternoon: Student presentations, Jeopardy review, give out final exam.

Final exam: Due by email on Wednesday, July 29 at 5pm. Late work will result in a 50% reduction in your test grade. You may work in groups or alone, your choice.

Papers to discuss:
You are responsible for reading all papers before they are discussed in class.
Here is a schedule of what paper to read for each day.

Week 1

Paper #1 Shrestha, T.K., Hecker, L.J., Aryal, A., and S.C.P Coogan. 2020. Feeding preferences and nutritional niche of wild water buffalo (*Bubalus arnee*) in Koshi Tappu Wildlife Reserve, Nepal.

Paper #2 Nelson, S.L., Justice, N., Apple, K.M., Liddiard, A.H., Elias, M.R., and J.D. Reuter. 2023. Changes to Health Parameters of White-Tailed Deer during a Drought in the US Virgin Islands.

Paper #3 Oster, K.W., Barboza, P.S., Gustine, D.D., Joly, K., and R.D. Shively. 2018. Mineral constraints on arctic caribou (Rangifer tarandus): a spatial and phenological perspective.

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Paper #4 Paez, D.J., Restif, O., Eby, P., and R.K. Plowright. 2018. Optimal foraging in seasonal environments: implications for residency of Australian flying foxes in food-subsidized urban landscapes.

Week 2

Paper #5: Sauer, E.L., Hite, J.L., and S.E. DuRant. 2025. The nutritional content of anthropogenic resources affects wildlife disease dynamics.

Paper #6 Beeby, N., Pierre, L.J., Guy, R.F.J., Justin, R., etc. 2025. Climate, diet, and nutrition drive gut microbiome variation in a fruit-specialist primate.

Paper #7 Thomsen, S.K., Mazurkiewicz, D.M., Stanley, T.R, and D.J. Green. 2018. El Nino/Southern Oscillation-driven rainfall pulse amplifies predation by owls on seabirds via apparent competition with mice.

Paper #8 Friebe, A., Swenson, J.E., and A. Zedrosser. 2023. Hibernation ecology of brown bears in Sweden.

Paper #9 Erb, W.M., Barrow, E.J., Hofner, A.N., Utami-Atmoko, S.S., and E.R. Vogel. 2018. Wildfire smoke impacts activity and energetics of wild Bornean orangutans.