

GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE AND TECHNOLOGY
BIOLOGY INSTRUCTIONAL GROUP

ENVIRONMENTAL AND CONSERVATION SCIENCES 2010
WILDLIFE BIODIVERSITY AND ECOLOGY
GPRC EV 2010

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Prerequisite: 3 credits in university-level biology

Time/Place: TBA

Transferability: University of Alberta ENCS 201 (currently under review)

Resources: Butler, J. 2001. ENCS 201 - Wildlife Biodiversity and Ecology. Manual and Workbook. 3rd ed. University of Alberta, Edmonton.

Diamond, J. 1999. *Guns, Germs, and Steel: The Fates of Human Societies*. Norton, London.

Gadd, B. 1995. *Handbook of the Canadian Rockies*, 2nd ed. Corax Press, Jasper, Ab.

Hardy, W.G. (Ed.) 1967. *Alberta: A Natural History*. Hurtig, Edmonton, Ab.

Note: A "Book List" is appended. Readings from these and other sources will be assigned weekly.

Course Objectives: This course is a survey of floral and faunal (in the "old sense") associations of Alberta (and other) ecosystems. New phylogenetic approaches to the "variety of life" - biodiversity will be discussed. We will emphasize interrelationships among species and the system in which they live. The communication of "wildlife values" and their benefits will be discussed. Present-day distribution of species will be examined in an historical and evolutionary context. Labs will stress identification of local species.

Course Nature: This course consists of three hours of lecture (class) per week and three hours of laboratory per week. Attendance is mandatory because guest speakers will be invited to address the class and laboratory sessions regularly. There will be at least two mandatory field trips during the semester. There will be an optional field trip to visit the Provincial Museum, the Muttart Gardens, and other venues in Edmonton (Thanksgiving weekend in the Fall semester or during Reading week/end in the Winter semester). Students will be expected to read text material or assigned readings and to come to labs fully prepared. Attendance at labs is mandatory.

Course Schedule/Major Topics/Mark Distribution:

Week 1	Introduction	Lab #1		
Week 2	Biogeoclimatic Zones	Lab #2		
Week 3	Aquatic Communities	Lab #3		
Week 4	Wetlands	Lab #4		
Week 5	Northern Lakes	Lab #5	Lab Quiz 1	5%
Week 6	Eastern Hardwood Forests	Lab #6		
Week 7	Grassland	Lab #7	MidTerm Exam	20%
Week 8	Aspen Parkland/Boreal	Lab #8	Lab Quiz 2	7%
Week 9	Aspen Parkland/Boreal	Lab #9		
Week 10	Aspen Parkland/Boreal	Lab #10	Lab Quiz 3	8%
Week 11	Mountains and Arctic	Lab #11		
Week 12	World Biodiversity	Lab #12	Final Lab Exam	20%
Week 13	Human Relationships			
Scheduled by the Registrar's Office			Final Exam	40%

WEEK 1: *Class:* Introduction and course fundamentals. Wildlife biodiversity in a biosphere context. The biodiversity of the major geographic regions of the world. Biodiversity as a formal science and its emergence as a political and economic factor. Biodiversity ethics. The interrelationships of "wild" biodiversity and domestication - not only of animals. The history of domestication. The definitions of "wildlife". Taking the material of this course from the local to the global. See WEEK 7.

Lab 1: Introduction to Lab Manual. Distribution of "loaner" lab materials.

WEEK 2: *Class:* Biogeoclimatic zones of Alberta and British Columbia. How are these zones defined? What does the major floral association tell us about the geological and biotic history of the area? What are the climatic factors that modify the critter distribution? Reviews of succession and stratification. Congeneric interactions reviewed in terms of spatial, temporal and competitive exclusions. What does Hutchinson or MacArthur have to say?

Lab 2: The use of maps, map reference systems, and locating one's self in the field.

WEEK 3: *Class:* Aquatic Communities. Types of Aquatic communities Permanent vs. temporary. Flowing water (streams and rivers) vs. standing water (lakes and ponds). Biotic structure. Alberta systems are emphasized, but mention will be made of other aquatic communities (eg., marine estuaries, intertidal, open ocean, salt lakes [there are some in Alberta too!]).

Lab 3: Introduction to sampling, collecting, and observing in the field. Aquatic, terrestrial, and living communities (critters themselves!) are often sampled to determine biologic diversity. Basic sampling methods will be used. This lab will also introduce the students to the plethora of good and bad field guides available to the specialist as well as the layperson. (Possible field sampling trip, depending on weather).

WEEK 4: *Class:* Wetlands. The changing distribution and abundance of Alberta's wetlands. Importance of wetlands to our economy. Wetlands as pollution indicators. Guest lecturer: Reg Arbuckle, Ducks Unlimited.

Lab 4: Measuring biodiversity. Using sampling and mapping methods learned in previous labs, students will design, sample and analyze a research problem in biodiversity. This lab will introduce a variety of "diversity indices" commonly used in the field and demonstrate the assumptions, strengths, and weaknesses of each.

WEEK 5: *Class:* Northern Lakes. The ecology of Alberta lakes with emphasis on the lakes of the Boreal Region. Invertebrate and vertebrate productivity. Species diversity and its limits.

Lab 5: Lab Quiz 1. identification of Alberta and British Columbia fishes (marine species included).

WEEK 6: *Class:* Eastern Hardwood Forests. Obviously not part of Alberta, but worth spending some time here. The remainder of Canada's biogeoclimatic structure. An overview of the geologic and biotic history of the Shield and Canada's eastern forests. A personal accounting of the instructor's research days in Algonquin Park at a Fisheries Research Lab in Ontario; ungulate, felid, and parasite research in central New Brunswick; and trapping small mammals for the National Museum of Canada and the Canadian Wildlife Service in Kejimikujik National Park in central Nova Scotia (with some queen crab/turbellarian research with DFO off the coast of Newfoundland thrown in!).

Lab 6: Identification of reptiles and amphibians of Canada. There aren't that many! We'll also start working on birds this week.

WEEK 7: *Class:* Grassland. The major grassland communities of central North America reach into Alberta. There are also some disclimax grassland communities near here! The grassland communities may be the first ones that we've looked at that, to us, may not seem "normal". How is the floral community reflected in its faunal diversity? How can we look at this set of communities in a macro way to show us the "evolutionary play in the ecological theatre"? Halfway through this course we need to re-examine the big biodiversity picture. While we understand that biodiversity is initially appreciated as a "natural history" and "species-identifying" or "species-counting" endeavor, it really has much greater ecological and evolutionary implications. **THIS IS NOT A 'NATURAL HISTORY' COURSE!** That would be too easy. This is a BIODIVERSITY course and brings different baggage. Perhaps this is the week we start to seriously talk about E. O. Wilson.

Lab 7: There is no lab, but the class midterm will be written during the lab time.

WEEKS 8, 9, & 10: Classes: If one looks at the various editions of Strong and Leggat's Ecoregions of Alberta one sees that the Grande Prairie area has gone from 'pink' to 'blue' on the maps. Is it Aspen Parkland or is it a Boreal forest sub-region? Obviously there is some question, but there is also good reason to put the discussion of the biodiversity in this/these region(s) together. We will spend 3 class weeks looking at the variety of critters in the region that makes up the largest area of our province. It also covers a whole bunch of north eastern British Columbia too. The boreal forest is the largest (land area-wise) biome in the world! We need to know more about it. Is it really dominated by conifers, or might some other critters be important? May other critters have some influence in the community structure. What does Hanski have to say about this? We'll have a bunch of great questions to start looking at in the "biodiversity mode"...

Lab 8: Lab Quiz 2. Identification of birds and mammals of Alberta.

Lab 9: Identification of birds and mammals of Alberta.

Lab 10: Lab Quiz 3. Identification of invertebrates of Alberta.

Note: Plan on a field trip - depending on weather - during one of these labs.

WEEK 11: Class: Mountains and Arctic. Here we'll examine Ben Gadd's Handbook. This is probably the most widely used and influential field guide in the province. It takes a geologic/evolutionary/synthetic approach that appeals to the non-geologist and the non-biologist. Is it useful? When Ben comes to class, can we help him to make the next edition better?

Lab 11: Now the identification of plants and the non-animal critters. We'll have the help of a few local field botanists (at least Rick Scott, Audrey Wells, and Don Albright) and perhaps a few others.

WEEK 12 & 13: Classes: World Biodiversity and Human Relationships. We'll try to use these last two weeks to put Alberta's meager biodiversity in context. If all goes well, we will have a guest lecturer or two in town, specifically by invitation for this course but speaking at an open lecture/forum for the community at large. You will be expected to be there! Even though I write this in 2002, there have been "standing invitations" out there and agreements which state: "...if I possibly can, I will, Terry" to some outstandingly influential people to dialogue with us in this course context. Stay tuned.

Lab 12: Final Lab Exam.