

## Graduate Seminar / Special Topics (1 cr. Biol 503 + 1 cr. Biol 590)

Fall 2003

### Ecology and Evolution of Wildlife Diseases

Schedule: Wed. 11 am – 1 pm

Purpose: In this course we will examine current theory and knowledge of diseases in populations of wild animals. We will consider a variety of questions including the natural history of disease organisms, impacts of diseases on individual hosts, spatial and temporal dynamics of host-pathogen interactions in wild populations, interactions of diseases with other environmental factors, evolutionary dynamics of host-pathogen interactions, management issues (in a broad sense, i.e. if there is a reason for intervention of some sort, what do / can you do and why?).

Text: Hudson, PJ et al. (2001) *The Ecology of Wildlife Diseases*. Oxford University Press.

other readings from the literature will be assigned as appropriate.

Requirements: Everyone is expected to come prepared (have done the reading and thought about the material) to take part in discussions. In addition, students, working in pairs, will **present two topics** during the semester. The second topic will be followed up with a written report due at the end of the semester (12 Dec). Each presentation will be followed by a discussion led by the team of presenters.

1. The first topic for each student will focus on conceptual and theoretical issues, generally using one of the book chapters as a starting point. Topics are listed below (3-9). A supplementary reading from the primary literature for each topic will also be selected by the presenters. The presentation and reading will form the basis for subsequent discussion. In each presentation, students will review the key concepts, theoretical issues, and as appropriate, the relevant modeling approaches. Examples and case studies may be used to illustrate these concepts and theories. Our goal in the first half of the course is to develop a comprehensive framework for the understanding of disease dynamics in wild populations.
2. The second presentation will involve a survey of diseases in a particular host taxonomic group (topics 10-16). The content of the presentation will include a broad survey of diseases of importance in each taxonomic group. Presenters should attempt to identify major patterns of disease occurrence within their group (e.g. related to habitat, type of pathogen, transmission patterns, etc). In the remainder of the presentation, they will focus on 2-3 diseases that they have identified as particularly important and/or well-studied. In each of these case studies, students will detail critical aspects of the natural history, processes and dynamics of the host-pathogen interaction as discussed in the first half of the course (topics 2-9). Students will also compare and contrast the dynamics of their selected case studies in the context of the general framework developed in the first half of the course. Finally, students will turn in a written report based on their presentation and the associated discussion.

<u>Tentative Outline:</u>			
<u>week</u>	<u>Topic</u>	<u>Reading</u>	<u>presenters</u>
<b>Concepts and theory</b>			
1	organizational		
2	Wildlife diseases – an overview of the problem Approaches to modeling host-pathogen interactions	Ch. 1	Vaughan Goodwin
3	Patterns of pathogen prevalence	Ch. 2	
4	Host – pathogen population dynamics	Ch. 3	
5	Community ecology of parasites	Ch. 4	
6	Transmission and Vectors	Ch. 5	
7	Spatial dynamics	Ch. 6	
8	Evolutionary dynamics		
9	Wildlife diseases, management, and conservation	Ch. 8	
10	Diseases of *		
11	Diseases of *		
12	Diseases of *		
13	Diseases of *		
14	Diseases of *		
15	Diseases of *		
16	Diseases of *		

Taxonomic Surveys: Diseases of ...

e.g.,  
 Fishes  
 Amphibians  
 Reptiles  
 Birds  
 Mammals