“Conservation Ecology and Wildlife Biology in the Age of Genomics”

In this seminar we seek to examine how advances in molecular biology and genetics are broadly influencing ecology and conservation. First we will explore historical underpinnings of natural history, the role ‘scientific natural history’ can play in biology, and how embracing molecular biology can improve ecology. We will examine the basics of DNA and PCR and explore various examples of the application of genetics to ecology including the effects of trophy hunting on a bighorn population’s gene pool; how a genetic change in a virus decimated an African lion population; and how the introduction of genes saved the Florida panther, to name a few. We also will consider advances in the use of genetic markers such as SNPs (single nucleotide polymorphisms) and microsatellites (highly repetitive DNA), and discuss alternative techniques and applications such as non-invasive sampling and the use of organism response as an early warning system for pollution. Finally, we will close with a focus on the evolution of man’s best friend, the dog. We will see how dogs originated, examine the similarities and differences between their genome and our own, and will discuss the promises genomics holds not only for ecology but for humanity as well.

1/23 - Week 1 – Introduction

1/30 - Week 2 – Scientific Natural History and its relationship to Conservation Ecology & Wildlife Biology


2/6 - Week 3 – The Evolutionary Consequences of Trophy Hunting: An Example of Management Effects on Heritable Traits


2/13 - Week 4 – The Basics of DNA and PCR


2/20 - Week 5 – No Class (Desert Tortoise Research Council)

2/27 - Week 6 – Phylogeography and Dispersal: Understanding within and among population variation

3/6 - Week 7 – Landscape Genetics: Coupling landscape ecology and genetics to understand large scale processes


3/13 - Week 8 – No Class – Wildlife Conclave

3/20 – Spring Break

3/27 - Week 9 – Application of Non-invasive Sampling


4/3 - Week 10 – Conservation Genetics: Rescuing the Florida Panther


4/10 - Week 11 – Emerging infectious diseases and their effects on Wildlife populations


4/17 - Week 12 – Canary on a chip – Ecological Genomics


4/24 - Week 13 – Ecological Genomics, cont.


5/1 - Week 14 – The evolution of the domestic dog

