BIO216 Conservation Biology

Topic 1 -
Introduction to conservation biology

Topic 2 -
What are we trying to save?

Topic 3 -
Extinction

Topic 4 -
Rarity, vulnerability & conservation status

Topic 5 -
Threatening processes 1: Habitat loss, degradation and fragmentation

Topic 6 -
Threatening processes 2: Overexploitation & invasive species

Topic 7 -
Threatening processes 3: Global climate change

Topic 8 -
Conservation at the species level

Topic 9 -
Conservation genetics

Topic 10 -
Conserving ecosystem diversity 1: Parks & reserves

Topic 2 - What are we trying to save?

Biodiversity:
- **Species diversity**: All species on Earth, from single-cell bacteria to blue whales
- **Genetic diversity:** The genetic variation within species, both among geographically separate populations and among individuals within single populations
- **Ecosystem diversity:** The different biological communities and their associations with the chemical and physical environment (the ecosystem)

What is a species?
- **Biological definition:** A group of individuals that can potentially breed among themselves in the wild and that do not breed with individuals of other groups
- **Morphological definition:** A group of individuals that is morphologically, physiologically or biochemically distinct from other groups in some important characteristic
- **Evolutionary definition:** A group of individuals that share unique genetic similarities and hence their evolutionary past (i.e. they share a common ancestor).
- **Phylogenetic definition** (combination of the morphological and evolutionary definition): A group of individuals that share unique morphological, physiological or genetic similarities and they share a common ancestor

Cryptic biodiversity:
- Opportunistic breeders
- Several subspecies within the same region
- Different subspecies have diff calls and body size (to tell apart)

Hybrids:
- A speciation of two [birds] which form one which is similar
- Native species can loose their characteristics due to this hybridisation
- Some hybrids are sterile and then can not reproduce

Taxonomy:
- Is the science of classifying organisms
- Species >
- Genus >
- Family >
- Order >
- Class >
- Phylum >
- Kingdom

Biological Species Concept (BSC)
- Two taxa are considered distance species, if they do not interbreed
- Reproductive isolation is the key to BSC
- BSC works well for defining species when taxa are sympatric (occur together)
- But problems occur with allopatric (geographically separated) taxa
- How do we know whether two allopatric taxa interbreed if they were merged?
- Taxonomists look for differences that would prevent interbreeding if theses two taxa came into contact
- But usually species on islands are considered subspecies

Phylogenetic Species Concept (PSC)
- **Monophyly** is the key to PSC (it consists of an ancestral species and all its descendants)
- Populations of one species share a common ancestor
- Taxa are distinguished on the basis of one fixed character
- PSC resolves the allopatric taxa problem