What is Wildlife?

• Numerous definitions exist:
  ∙ Only game species
  ∙ Only birds and mammals
  ∙ All terrestrial vertebrates and invertebrates
  ∙ “the practical ecology of all vertebrates and their plant and animal associates.” JWM 1937
  ∙ “Wild animals, usually terrestrial vertebrates whose populations are monitored and managed for exploitation or conservation.” Sinclair et al. 2006
Wildlife Defined

- **Wildlife**—*All terrestrial vertebrates except captive domesticated animals*
  - Game species
  - Non game species
  - Feral animals
  - Can be invasive/exotic or native
- What it does not include:
  - Pets
  - Livestock
Wildlife Management

- Management indicates that human manipulations and decisions are present
  - active or passive
  - direct or indirect
- Management confers sense of human domination of nature
- Management and conservation can be synonymous
Defining Wildlife Management

• Wildlife Management:
  • “Game management is the art of making land produce sustained annual crops of wild game for recreational use.” Leopold 1933
  • “the management of wildlife populations in the context of the ecosystem.” Sinclair et al. 2006
  • “the application of ecological knowledge to populations of vertebrate animals and their plant and animal associates in a manner that strikes a balance between the needs of those populations and the needs of people.” Bolen & Robinson 2003
Interdisciplinary View of Wildlife Management (3-legged stool paradigm)
Result of Market Hunting and lack of regulations
Mountain lion, adult wolf, and total wolf pelts for presented for bounty in Montana, 1884 - 1930
Near Extinction

• Photograph from the mid-1870s of a pile of American bison skulls waiting to be ground for fertilizer.

• During the 19th century, hunting played a major role in the extirpation or near extirpation of many species.
Extinction

• Most numerous bird on Earth in mid 19th century
• Michigan was its last stronghold
• 3,000,000 birds shipped from there by a single hunter in 1878.
• In 1889 the species was extinct in MI.
• Last individual (Martha) died in 1914 in the Cincinnati Zoo
Extirpated Wildlife

• Lions in Europe
• Carolina parakeets
• Great auk
• Heath hen
• Hawaiian avifauna
  – po'ouli
  – Approximately half of endemic birds
Causes of Extinction

• Most common drivers of extinction (in order of importance)
  1. Contraction (i.e. loss) and modification (i.e. alteration) of habitat
  2. Unsustainable harvesting by humans
  3. Introduction of a novel pathogen, predator, or competitor (i.e. exotic species) into the environment
Rise of Wildlife Management and Policies

• Need to manage for wildlife
• “The real problem of wildlife management is not how we shall handle the animals… the real problem is one of human management.”--Aldo Leopold, 1943
Wildlife Law

- Europe (Roman Empire to Magna Carta; 1215)
  - wildlife belonged to the king
- Following Magna Carta king kept wildlife in “sacred trust for people”
- Later, wildlife became the property of Parliament (the governing body)
- United States – wildlife is owned by the people – “public trust” resource
  - HI poses unique challenges of this idea
Scales & Approaches to Understanding Wildlife

- **Individuals**
  - Physiological and nutritional ecology
  - Animal behavior

- **Populations**
  - Population dynamics (i.e. animal demography): births, deaths, immigration, and emigration

- **Communities**
  - Competition, predation, etc.

- **Ecosystem**
  - Trophic dynamics, food webs, resilience and resistance
Population Dynamics

• The characteristics of populations are not static, but rather they change over time
• In other words, populations are ‘dynamic’
• Due to balance or change in rates of:
  1. Birth
  2. Death
  3. Immigration
  4. Emigration

β These are the only 4 ways a population can change

• Estimating these and other characteristics require the use of demographic techniques (i.e., life tables and population models)
Populations: Modeling & Counting

• Simple population models:
  – Exponential & geometric growth (unlimited growth)
  – Logistic growth (limited by carrying capacity)

• Metapopulation models
  – Population is comprised of subpopulations
  – Sources and sinks

• How to estimate populations
  – Abundance, census, survey

whooping crane
How Large is This Population?
White-eared kob antelopes

31 Antelope?
<table>
<thead>
<tr>
<th>Interaction</th>
<th>Species 1</th>
<th>Species 2</th>
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<tbody>
<tr>
<td>1. Competition</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. Mutualism</td>
<td>+</td>
<td>+</td>
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<td>3. Exploitation</td>
<td>+</td>
<td>-</td>
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<tr>
<td>4. Commensalism</td>
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Habitat

• Before we discuss management, need to understand habitat
• Habitat is used in a variety of ways
• Often times it is used to describe an area supporting a particular type of vegetation
  – Likely arose out of habitat type, referring to “land units having approximately the same capacity to produce vegetation.”
• This vegetation provided the three basic components necessary for animals: 1) cover, 2) food, and 3) water
Habitat Continued

• However, habitat is best described as relating to a particular species, and sometimes even to a particular population

• **Habitat**—*an area with a combination of resources (food, water, cover) and environmental conditions (temp., precip., presence of predators) that promotes occupancy by individuals of a given species (or population) and allows those individuals to survive and reproduce*