

# **Course- WL 703, Principles of Wildlife Management**

**Course Instructor; Dr. Sangam Khalil**  
**Dept. Forestry Range & Wildlife Management**

## **9<sup>th</sup> Lecture**

### **Wildlife mortality:**

Mortality can be

-natural

-due to competition

-Disease

-or Unusual i.e roadkil, Poaching, Poisoning

Mortality leads to population reduction.

### **Types of Mortality:**

- Normal mortality
- Abnormal mortality

### **Normal Mortality:**

Normal mortality is either due to disease or predation

It is the type mortality that have been common in evolutionary history of wildlife spp

It is the natural phenomena of removal of inferior animals

### **Abnormal Mortality:**

It is the type of mortality that has not been common in evolutionary history of wildlife spp

Occurs due to road kill, window collision, internal injury bleeding etc

## **Mortality and Wildlife Management;**

### **Causes of wildlife mortality**

- **Harvest**

To take animals from wildlife population for game or research purpose

Example of legal harvest is sport hunting and commercial hunting

The number, sex, ages of harvested animals can be managed or protected by certain control measures in context of sport hunting

--length of hunting season: if it is short term then we can control hunting mortality. More animals are hunted in long hunting season

--opening and closing dates of hunting season

---species and sex of animals that are harvested i.e female and juveniles are not allowed for hunting

While in males only older males are allowed for hunting

- **Accidents**

--some animals fall from cliffs

-- road kills

-Rail road accidents

-Animals are drowned

-Window collision

- **Predation**

Predation is a biological interaction where one organism, the predator, kills and eats another organism, its prey. It is one of a family of common feeding behaviours that includes parasitism and micropredation and parasitoidism

There are four commonly recognized **types of predation**: (1) carnivory, (2) herbivory, (3) parasitism, and (4) mutualism. Each **type of predation** can be categorized based on whether or not it results in the death of the prey.

---Sanitation effect:

Inferior animals will be removed from prey population called as sanitation effect studied by Kolensky 1972

Population control by predators:

As **predator populations** increase, they put greater strain on the prey **populations** and act as a top-down **control**, pushing them toward a state of decline. Thus both availability of resources and **predation** pressure affect the size of prey **populations**.

Factors effecting ratio of predator abundance:

1. Numerical response;

Numerical response of predator towards prey abundance

Mean if prey population increases-----will provide more food to predator thus

Prey increase -----predator increases

2. Prey diversity

It depends either predator feed on one type of prey or more diverse prey spp

3 Geographic concentration

4. Competition among predators for prey

5. Intrinsic regulation of predator population

- **Exposure**

Wildlife expose to extreme weather conditions

i.e heavy rainfall, intense hail, blowing snow, storms, tornados, Earth quake

- **Disease**

**Toxic disease**

Human activities cause toxicity in environment i.e DDT, pesticides use

**Infection**

Due to various infections i.e virus, bacteria, fungi, arthropods, protozoa

Example

Birds malaria

Brain worm infections

**Nutritional Deficiencies**

i. e phosphorous deficiency in herbivores cause impaired reproduction

Calcium deficiency causes lactation failure

## **Density and mortality**

### **Directly density dependant mortality**

Many wildlife populations are influenced by density-dependent factors. A density-dependent factor acts in proportion to the number of animals per acre or square mile within a population. Natality and mortality often fluctuate with changes in density. Some diseases are density-dependent, meaning a higher percentage of the population becomes infected as density increases.

Example: White-tailed deer populations often exhibit density-dependent reproduction. As white-tailed deer populations grow, less food is available to feed all animals in the population. A reduction in food leads to delayed sexual maturity for females, decreased reproductive rates, and a lower rate of fawn survival.

### **Density independent mortality**

A density-independent factor is a factor that operates independently of population density. Wildlife biologists usually have no control over density-independent factors. Droughts, hurricanes, floods and severe winter storms are examples of density-independent factors. Although wildlife biologists cannot control Mother Nature, they can help to lessen the impacts of density-independent factors by keeping wildlife populations in balance with the habitat.

### **Compensatory mortality**

The concept of compensatory mortality assumes that one kind of mortality replaces another kind of mortality in a population. An animal dying from one cause, such as disease or predation, cannot die from another cause such as hunting or starvation. In a population where compensatory mortality is present, the total mortality rate will not be greatly influenced by changes in any one single cause of death. If death due to predation in one year is 10 percent and death due to disease is 25 percent, the total mortality is 35 percent. If in the next year, death due to predation is 25 percent and death due to disease is 10 percent, the effect of predation is compensatory.