

Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (Third Year)

Subject: Zoology

Course Code: ZOC 109

Course Title: Environmental Biology and Toxicology

Unit 3: Population Dynamics

Module Name: Introduction to Population Ecology and Natality

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Notes

Population Ecology is the study of factors that affect population and how and why a population changes over time. It has its deepest roots and its richest developments in the study of population growth, regulation and dynamics. It includes understanding, explaining and predicting species distributions. Population has various group characteristics which are statistical measures that cannot be applied to individuals. The basic characteristic of population is its size or density which is affected by four primary population parameters- Natality, Mortality, Immigration and Emigration. In addition to this one can derive secondary characteristics of a population- age distribution, genetic composition and pattern of distribution of individuals in space. The population with respect to birth rate, death, reproduction etc forms the signs of demography. When it is studied from ecological point of view, this forms a population ecology.

The term Natality is used to define the birth rate, which is a positive force for the increase of population density. Natality of a population is the number of new individuals produced by birth, hatching, germination or fission in per unit time.

Natality is expressed as:

- a) Crude birth rate- number of births in a population of unit size (50 births/1000 individuals)
- b) Specific birth rate- Expressed for the individuals of a particular age or sex.

Natality is of two types:

1) **Physiological Natality or Maximum Natality**

It is the theoretical maximum production of new individuals under normal conditions, in which there are no ecological limiting factors and the reproduction is limited only by physiological factors (Fecundity rate). It is constant for a population.

2) **Realized or Ecological Natality**

It is the population increase under specific environmental conditions. Level of the physical constraints in nature varies in time and space. It takes into account all possible existing environmental conditions. It is not constant for a population.

Members of a population do not interbreed with other populations because of genetic mechanisms, which prevent them from interbreeding and producing fertile offspring. These mechanisms preserve the integrity of a species by preventing hybridization.