

TOPIC: FACTORS LIMITING POPULATION GROWTH

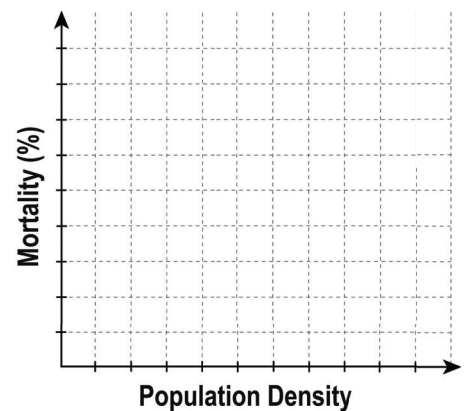
- ◆ In the absence of ecological factors that _____ population growth, a population will grow *exponentially*.
- ◆ These limiting factors can be separated into _____ types:

1) Density-_____ Factors

2) Density-_____ Factors

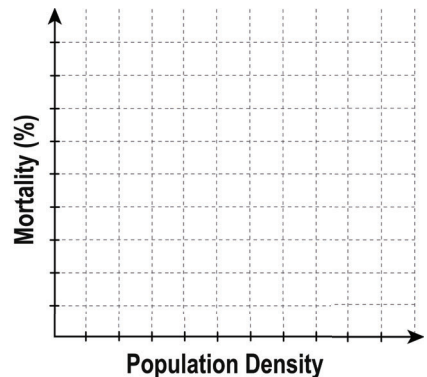
1) Density-Dependent Factors

- ◆ **Density-Dependent Factors:** limiting effects on growth are directly _____ on population density.
 - Impact *intensifies* as population density *increases*. Most of these factors are _____.
 - E.g. As population density increases, resources are exhausted, leading to _____ death rate & _____ birth rate.
 - **Carrying Capacity** (_____): the theoretical _____ population an area can sustain at any given time.



2) Density-Independent Factors

- ◆ **Density-Independent Factors:** limiting effects on growth are _____ of population density.
 - _____
 - Factors limit population growth equally, regardless of population density.



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EXAMPLE

Label each of the following factors as a density-dependent (D) or density-independent (I) factor.

1. A disease epidemic among the African elephant population: _____
2. A severe flash flood in northern India: _____
3. An increase in the number of predators that prey on squirrels: _____
4. Severe wildfires in Californian forests during the summer: _____
5. Overcrowding at a watering hole in Kenya's Aberdare National Park: _____

PRACTICE

Which of the following is a density-independent factor that limits a population's growth?

- a) Disease. c) Lack of food availability.
b) Drought. d) Predation.

Density-Dependent vs. Density-Independent Factors

◆ Let's compare these population growth-limiting factors side-by-side:

	Density-Dependent Factor	Density-Independent Factor
Definition	Factor whose impact depends on population density.	Factor whose impact does _____ depend on population density.
Relation to Population Density	Impact is proportional to population density, increasing with population density.	Impact is constant, regardless of population density.
Impact on Small & Large Populations	_____ impact on high-density populations approaching carrying capacity (K). Lower impact on low-density populations.	Equally impacts low & large density populations.
Common Effects	Regulates max population size.	Can cause sudden, drastic changes in population size.
Nature of Factor	Factors are typically biotic.	Factors are typically _____.
Examples	Competition, Predation, Disease, H ₂ O availability, Waste accumulation, Limited Space/Nutrients.	Hurricane, Flood, Wildfire, Droughts, Earthquake, Temperature extremes, Seasonal changes.