Name: _____

Date: _____

Class: _____

IB ESS

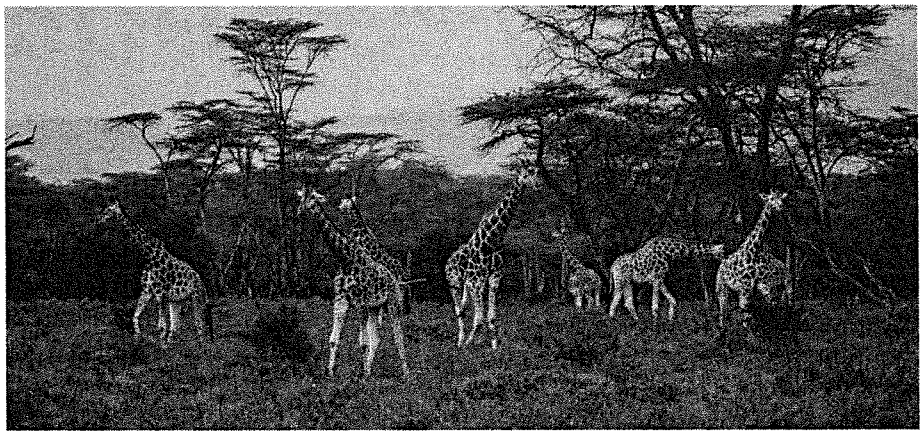
2.1 Species and Populations

Significant ideas:

A species interacts with its abiotic and biotic environment, and its niche is described by these interactions.

Populations change and respond to interactions with the environment.

All systems have a carrying capacity for a given species.



Key Vocabulary

1. Define the following:

Species

A group of organisms sharing common characteristics that can interbreed and produce fertile offspring

e.g. Equus asinus (donkey)

Habitat

The environment in which a species normally lives

The habitat of the African elephant includes savannahs, forests, deserts and marshes.

Niche

An ecological niche is where, when and how an organism lives

e.g. the niche of an elephant includes everything that defines this species; habitat, interactions between members of the herd, what and where it feeds.

Abiotic factors

Abiotic factors are the non-living, physical factors that influence the organism and ecosystem

e.g. temperature, sunlight, pH, precipitation, soil and topography

Biotic factors

Biotic factors are the living parts of the environment

Includes interactions with other organisms

Carrying capacity

maximum number of a species or 'load' that can be sustainably supported by a given area over a long period of time

2. Distinguish between *fundamental niche* and *realized niche*.

No two species can have the same niche

The fundamental niche describes the full range of conditions and resources in which a species could survive and reproduce

The realized niche describes the actual conditions and resources in which a species exists due to its biotic interactions such as competition and predation

3. Explain why population growth slows when a population approaches its carrying capacity.

- limiting factors begin to affect the population and restrict its growth
- increased competition for resources (food, space, mates)
- increase in predators and an increase in disease and mortality due to increased numbers of individuals living in a small area

Interactions

1. Define the following species interactions

Competition

is the demand by individuals for limited environmental resources. Can be within species (intraspecific) or between different species (interspecific) when niches overlap.

Predation

Occurs when one organism (predator) hunts and eats another organism (prey).

e.g. snowy owls hunt and feed on lemmings.

Herbivory

an interaction where an animal feeds on a plant.

e.g. hippo feeding on land vegetation

Parasitism

An interaction between a parasite and its host. The parasite benefits at the expense of the host e.g. tapeworm.

The carrying capacity of the host may be reduced because of harm caused.

Mutualism

Like parasitism this is a form of symbiosis where 2 organisms live together but in mutualism both species benefit e.g. coral polyp and zooxanthallae.

2. Distinguish between intra- and inter-specific competition.

within species ↓ ↘ between species

The stronger competitor will reduce the carrying capacity of the weaker competitor.

Population Changes

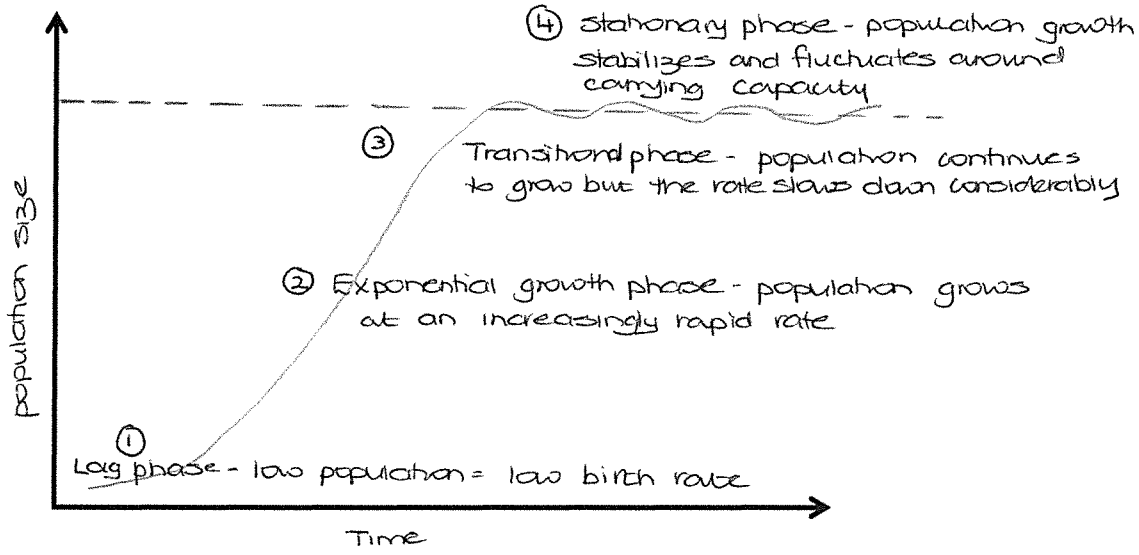
1. Outline what is represented in S and J curves.

Population growth curves. A population is a group of organisms of the same species living in the same area at the same time.

2. Draw a **labeled** S and J curve.

- Include a dotted line to represent the carrying capacity.
- Show fluctuation on the J curve.

S curve:



J curve: