Biology 1100

Review for midterm two

IT’S ALL ABOUT ECOLOGY!

Biotic and abiotic factors limit species' distribution: https://www.youtube.com/watch?v=0mjafH5pVLA

1. Biotic factors are such things as:
    a) Predation
    b) Competition
    c) Disease
    d) Food
    e) All of the above

2. Abiotic factors are:
    a) Living
    b) Non-living

3. Which specific biotic factors affect a clownfish?

4. Which specific abiotic factors affect a clownfish?

5. Investigate the factors limiting the distribution of:

a) Grizzly bears (*Ursus arctos horribilis*)

b) Great white sharks (*Carcharodon carcharias*)

c) Giant redwood (*Sequoiadendron giganteium*)

Lake stratification (https://www.youtube.com/watch?v=X26ocQkhNH4)

1. In a lake, the zone closest to shore is called the:
   a) Limnetic zone
   b) Littoral zone
   c) Benthic zone
2. In the summer, warm water is deeper than cold water.
   a) True
   b) False
3. In winter, warm water is deeper than cold water.
   a) True
   b) False
4. In spring and fall, lake turnover causes uniform temperature.
   a) True
   b) False

Density and dispersion

Read this knowledge project article about density and dispersion and define the following terms.
https://www.nature.com/scitable/knowledge/library/density-and-dispersion-19688035/

Density	Quadrat sampling	
Dispersion	Mark-recapture	
Random dispersion	Uniform dispersion	Clumped dispersion

Can statistics be used to determine dispersion?

Resource partitioning

https://www.youtube.com/watch?v=0w5-UfEi470

1. The pileated woodpecker and the sapsucker live in the same forest.
    a) true
    b) false
2. The two species partition food in the forest.
    a) true
    b) false
3. The specialized part of the woodpeckers' that partitions food is the:
    a) head
    b) tongue
    c) feet

Symbiosis

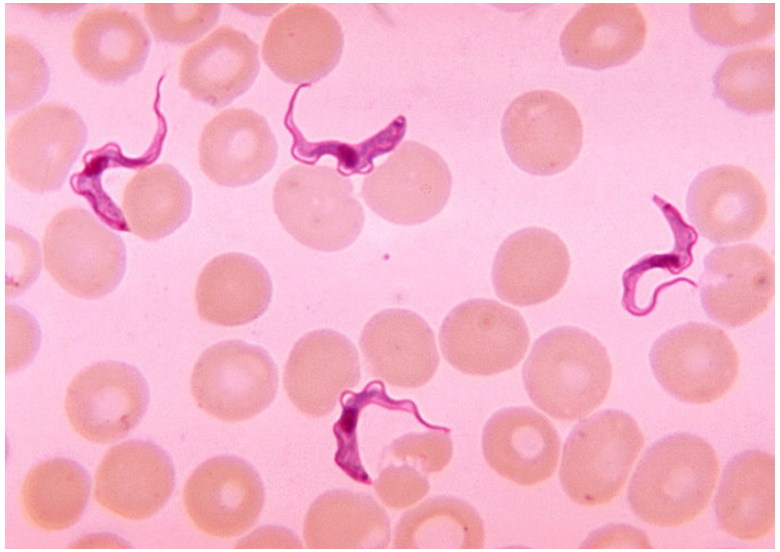
There are three main kinds of symbioses: mutualism, parasitism, and commensalism. For the following images, determine the kind of symbiosis taking place.

A

B

C

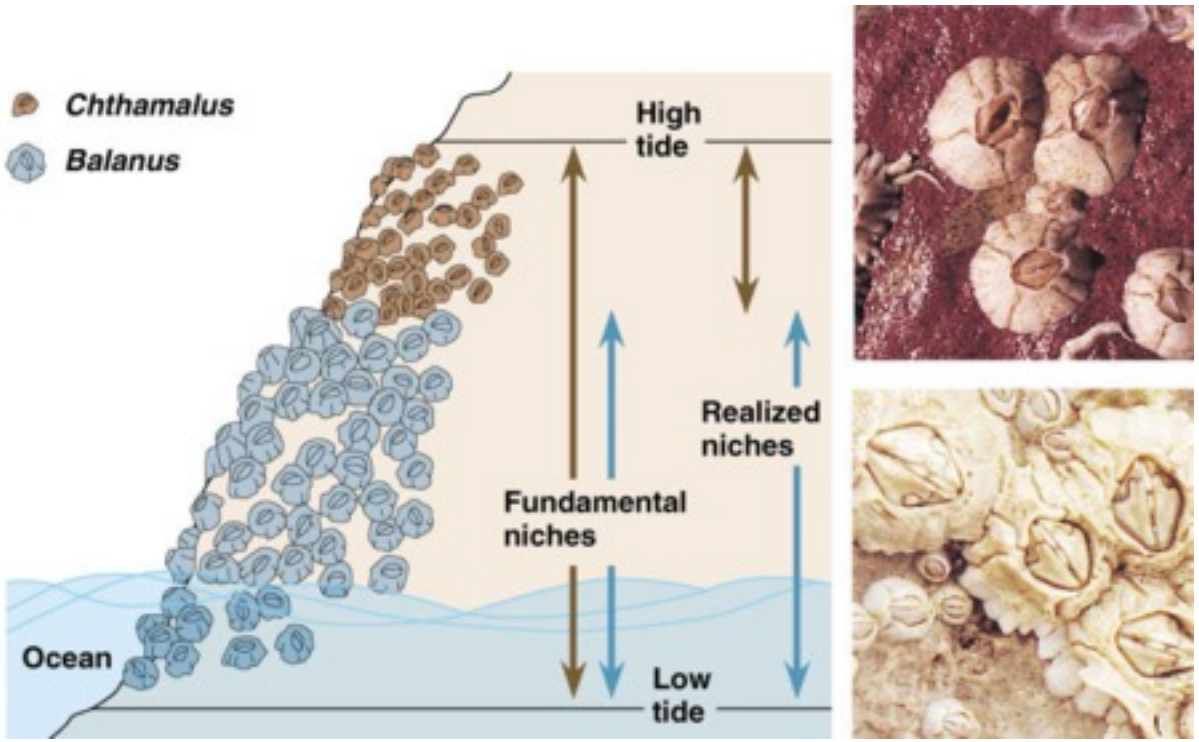
D



E

F

Which community principle is exhibited here?



Competitive exclusion principle:

- Gause's principle of competitive exclusion

No two species can occupy the same ecological niche; eventually one will outcompete the other. This because even if one of the two species has a slight advantage or edge it will be able to produce more offspring.

Which of these are cryptic, and which are aposomatic (warning) colouration?

A

B

C

D

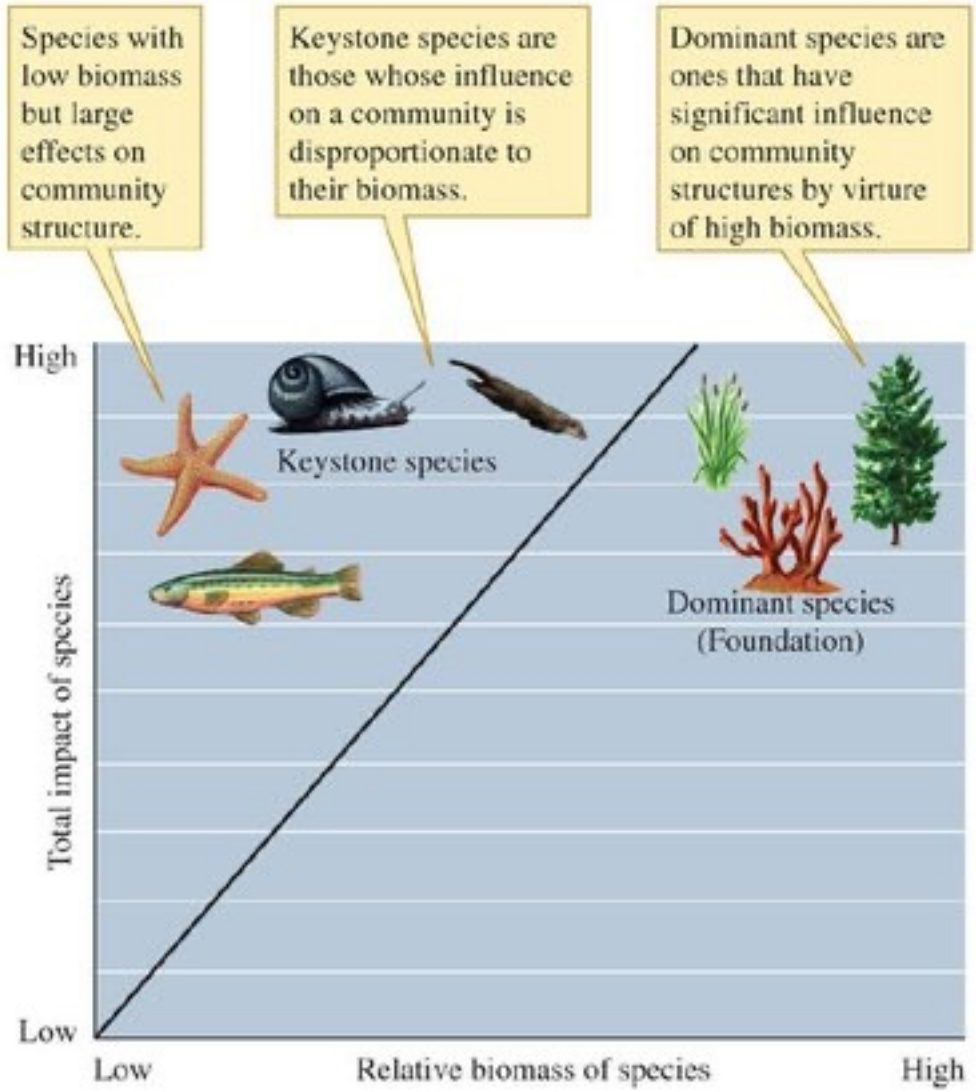
E

F

Q. What is the difference between a dominant species in an ecosystem, and a keystone species?

These images are hints.

Keystone vs. Dominant Species



Succession

Play the succession game!

https://biomanbio.com/HTML5GamesandLabs/EcoGames/succession_interactive.html

Trophic levels

Play the following game. You will have to sign up to PurposeGames (it is free).

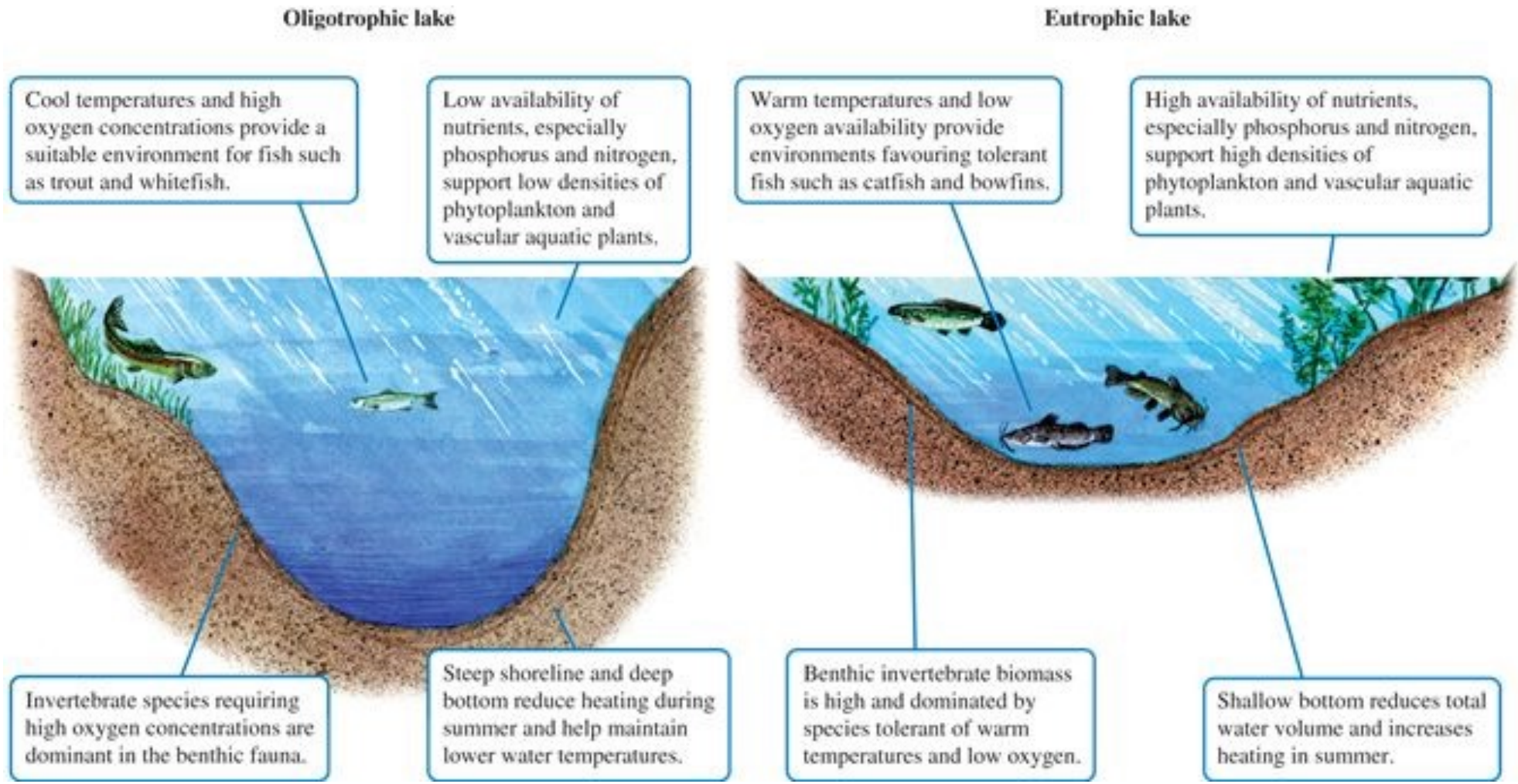
1. Trophic levels

https://www.purposegames.com/game/WKHuOnjUfUy

Fun food chain game:

https://www.cserc.org/sierra-fun/games/build-food-chain/

Which of these lakes is eutrophic?


Oligotrophic lake
Cool temperatures and high oxygen concentrations provide a suitable environment for fish such as trout and whitefish.
Low availability of nutrients, especially phosphorus and nitrogen, support low densities of phytoplankton and vascular aquatic plants.
Invertebrate species requiring high oxygen concentrations are dominant in the benthic fauna.
Steep shoreline and deep bottom reduce heating during summer and help maintain lower water temperatures.
Eutrophic lake
Warm temperatures and low oxygen availability provide environments favouring tolerant fish such as catfish and bowfins.
High availability of nutrients, especially phosphorus and nitrogen, support high densities of phytoplankton and vascular aquatic plants.
Benthic invertebrate biomass is high and dominated by species tolerant of warm temperatures and low oxygen.
Shallow bottom reduces total water volume and increases heating in summer.

Review nutrient cycling.

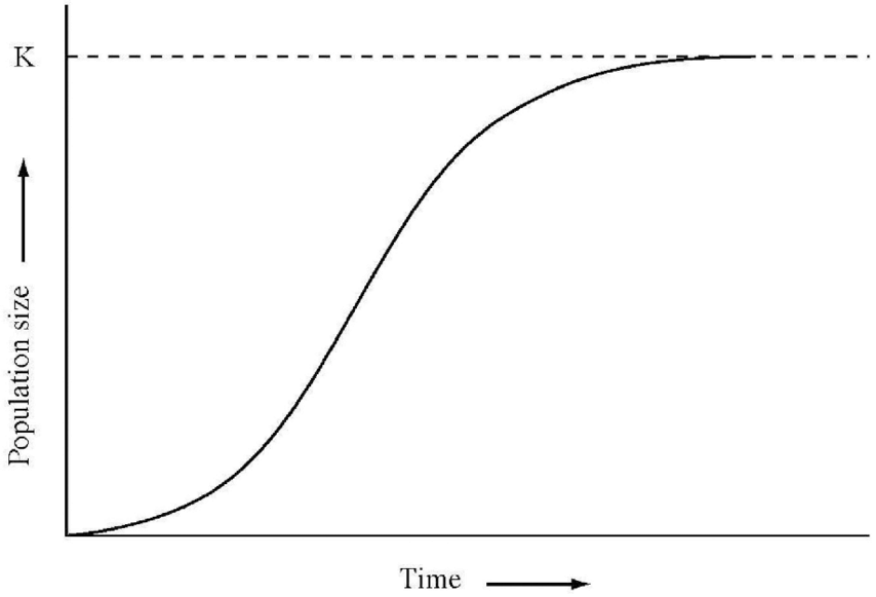
Review at the Khan Academy:

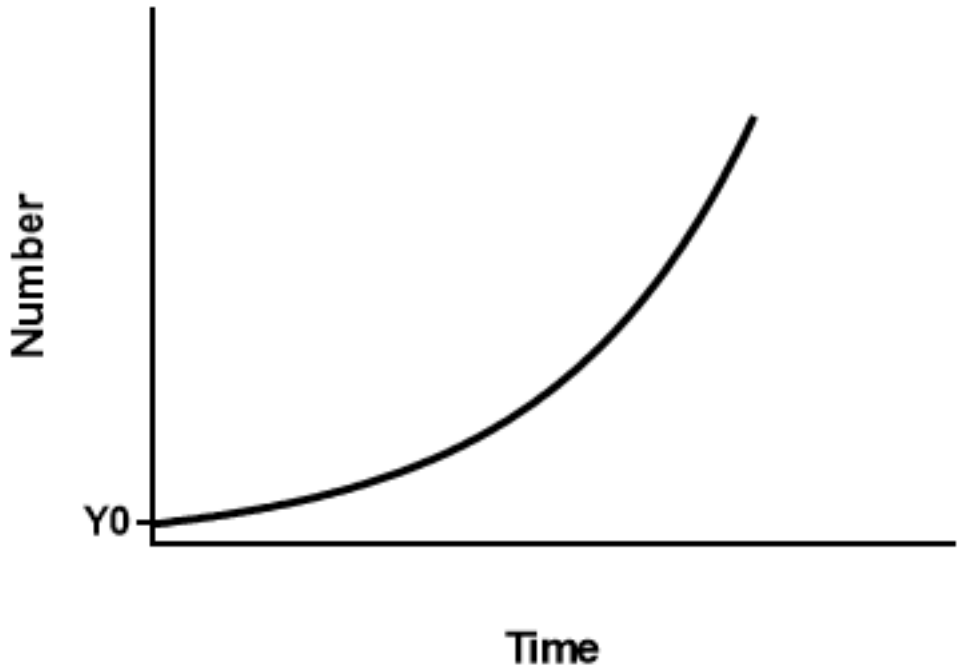
https://www.khanacademy.org/science/biology/ecology/biogeochemical-cycles/v/biogeochemical-cycles

Play the water cycle game:

https://www.purposegames.com/game/acc19e71b9

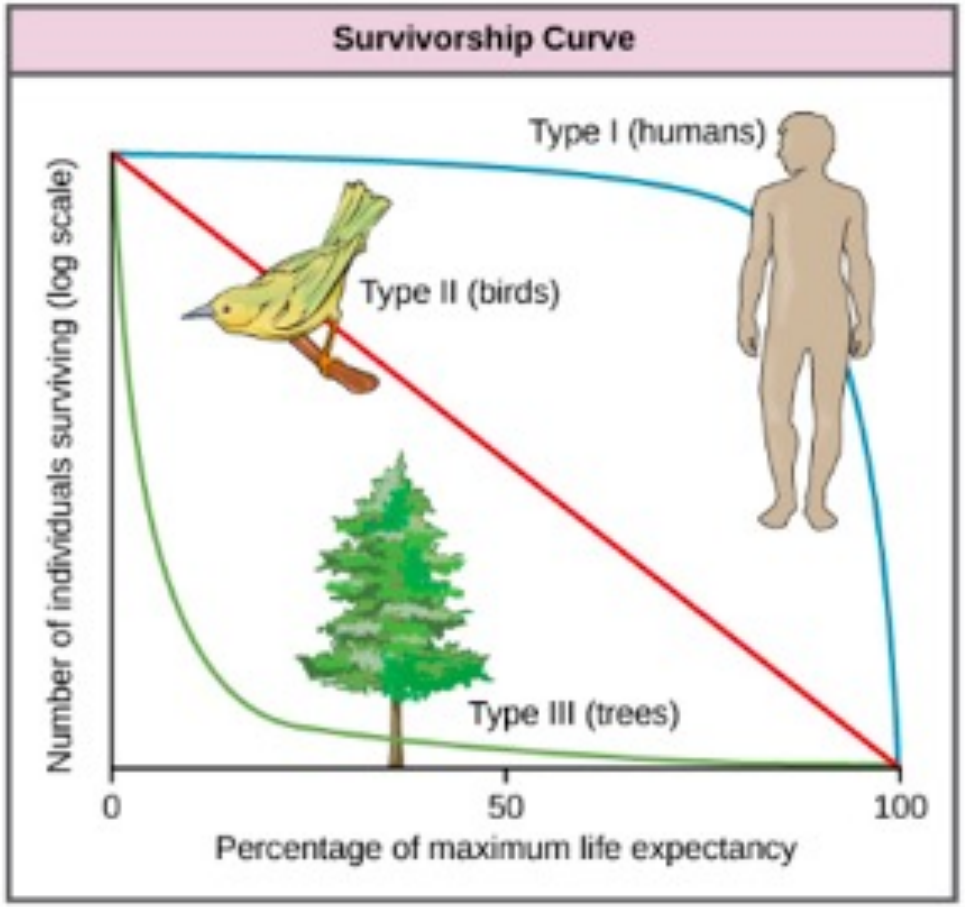
Which of the following portrays exponential growth, and which logistic growth of a population?

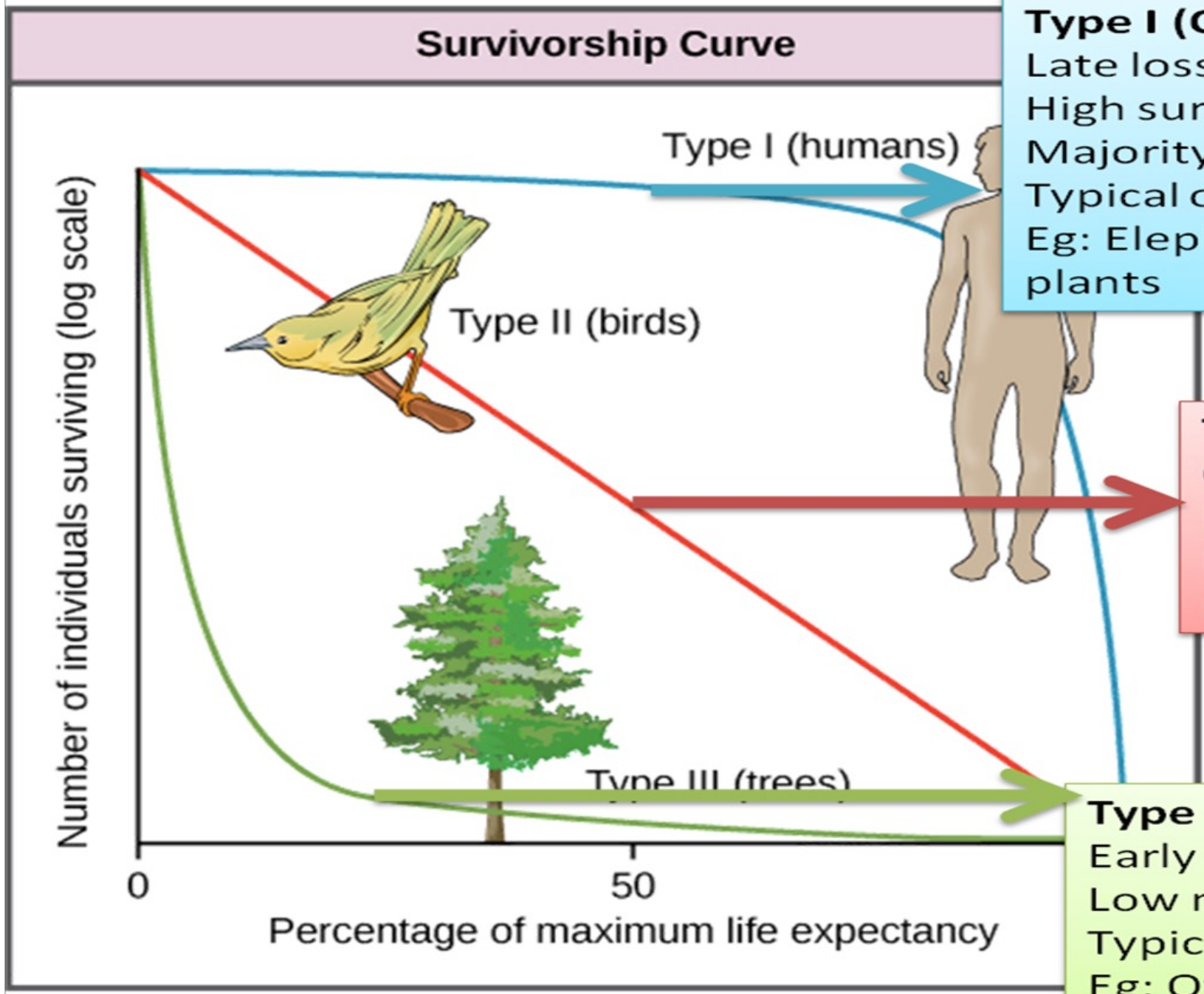




What does K represent?

Interpret the following survivorship curves.





Type I (Convex curve)
Late loss
High survivorship throughout life
Majority reaches maturity
Typical of k selected species
Eg: Elephants, Humans, annual plants

Type II (Diagonal curve)
Constant loss
Independent of age
Eg: Birds, rodents, Hydra, perennial plants

Type III (Concave curve)
Early loss
Low mortality after maturity
Typical of r -selected species
Eg: Oysters, Small fishes, trees