Questions on Populations

A. For each of the underlined species, identify the following changes as density-dependent OR density-independent factors on the population.

1. A few animals infected with tuberculosis are accidentally introduced into the Canadian **wood bison** herd in northern Alberta.

2. Arsenic leaks from a mine and enters a river where **crayfish** live.

3. A pack of 15 **wolves** move across the border from Canada into a very large Montana park where they find adequate food, but frequently do not find mates for several years.

4. Zebra mussels enter the Great lakes and grow on any surface, filtering food from the water and being eaten by a wide variety of ducks, including **scoters**.

4. The **whooping cranes** in Florida are doing well with numbers over 200, but they still do not know how to do the proper mating dance to stimulate ovulation.

6. **Brown snakes** arrive on Guam where they eat birds, lizards, nest under rocks and have no island predators and the snakes have become a serious pest with a bounty placed on them.

B. Make survivorship curves of the three species below indicating which is most 'r' and which most 'K' –like.

Species X – 1000 seeds released at a time; mature at 6 months; lives average of 7 months

Species Y – 10000 seeds released at a time; mature in 3 months; lives average of 5 months

Species Z – 100 seeds released at a time; mature at 18 months; lives average of 48 months

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C. Identify which of the plant species [X,Y or Z above] will do best in the scenarios below:

Scenarios

7. A forest fire has just burned through an area.

8. An area has been left as parkland since 1925.

9. A beetle from Asia that strips all the leaves off plants has arrived in a Canadian forest.

10. An area near a river is prone to flooding, on average, once every 7 years.

11. Migratory bison come through the area every second year to feed on plants.

D. Select the type of symbiosis seen in each of the examples below

12. An acacia tree produces sugary globules that are eaten by insect-killing ants that live inside the hollow stems of the acacia.

13. A remora sticks to the underside of a shark where it picks up scraps of food dropped by the shark.

14. A photosynthetic alga lives inside the rigid chitin skeleton of a fungus.

15. A wasp disguises itself as an ant and enters the ant burrow where it is fed and looked after by workers that normally feed young ants.

LIVEWORKSHEETS

D. SURVIVORSHIP and SELECTION TYPE

1. Survivorship curves – tell us how long individuals _____ in a population

type I – species with a _____ survival rate of their young

- most of the individuals are expected to die only when _____
- eg _____

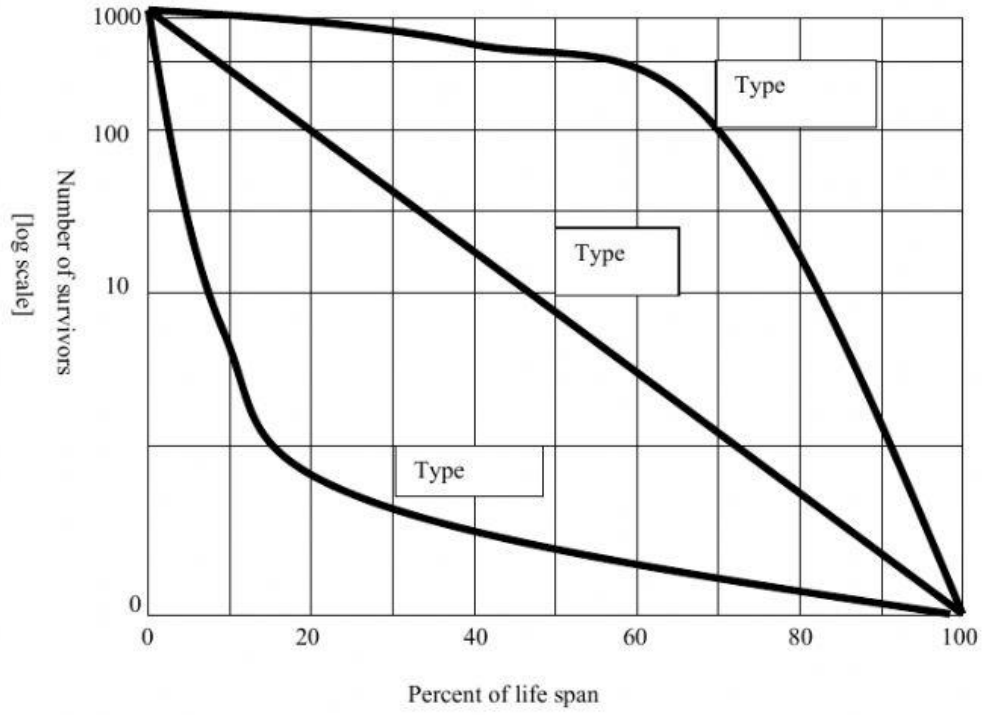
type II - species in which individuals die at a _____ rate from predation, disease, etc.

- eg squirrels, bees, most reptiles

type III-species with most individuals die when _____

- _____ babies are born, but _____ survive very long
- eg tobacco, salmon, oysters

Survivorship curves



LIVEWORKSHEETS

2. 'r' and 'K' selection

a. 'r' refers to species whose population is well _____ the carrying capacity and so can still grow _____ with a rate 'r'

b. 'K' refers to populations that are _____ the carrying capacity [K]

c. 'r' and 'K' refer to different _____ that will ensure the_____ of the species

d. the environment, _____ of the organism, _____ & _____ of offspring, maturity, _____ expectancy and frequency of _____ all influence this

r Unstable environment, density independent	K Stable environment, density dependent interactions
_____ size of organism	_____ size of organism
energy used to make each individual is _____	energy used to make each individual is _____
_____ offspring are produced	_____ offspring are produced
_____ maturity	_____ maturity, often after a prolonged period of _____
_____ life expectancy	_____ life expectancy
each individual reproduces _____	individuals can reproduce _____
type _____ survivorship pattern	type ___ or _____ survivorship pattern
in which most of the individuals die within a short time but a few live much longer	in which most individuals live to near the maximum life span

LIVEWORKSHEETS

E. INTERACTIONS WITHIN COMMUNITIES

1. Interspecific competition

   a. 2 or more species struggling for the _____ resource

   b. both species will _____

   c. eg. two plants growing in the same shallow depression compete for water & neither gets enough

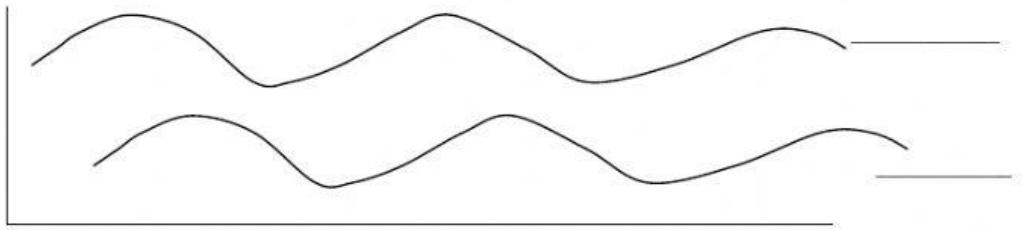
2. Predation

   a. one species _____ and _____ another

   b. the predator _____ but the prey _____

   c. but if the predator eats too _____ prey,

   then the prey _____ & predator also _____



   d. note: there is always more of the _____

   the two cycles are out of _____ as there is a delay in the effect

   as predator #'s increase, prey #'s _____; as prey #'s fall, predator #'s _____

3. Defense mechanisms

   a. _____– don't get seen by predator OR prey eg.

   b. _____– produce or accumulated eg. _____ butterfly

   c. _____- pretend to be toxic eg. _____ butterfly

4. Symbiosis

   a. _____ - both gain eg. _____ & giraffe

   b. _____ - one gains, one unaffected eg. _____ on back of turtle

   c. _____ - one gains, one loses eg. _____ and you

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F. Endangered species.

Meaning of status

1. _____ is beyond help.
2. _____ can only be saved by imports.
3. _____ is in serious trouble & we must act fast to save these species.
4. _____ means we have more time before they become endangered.
5. _____ means we need to be concerned in the future.

Causes of endangerment

1. _____ Once the trees are gone, everything that lived in them is gone as well.
2. _____ We are running out of many species of fish.
3. _____ The introduced starling has taken nest sites from many local birds.
4. _____ The pond still exists, but now few things can live in it.

Factors influencing Endangerment

a) SIZE _____ animals need more food and more space.

Both animal may eat a similar _____ BUT one eats much more &

so needs to _____ more to find more food

b) RANGE An animal that is found in _____ place is at risk if anything happens to that place.

The species with a _____ range is at greater risk

than one that is found everywhere in Canada

c) DIET A _____ is at greater risk because its food may become rare

more readily than a _____ food

d) BIOTIC POTENTIAL _____ rate, survival to reproductive age, births per _____ and

births per _____ are all part of this. eg._____ breed much faster than buffalo.

e) HUMAN INTERACTIONS Some animals do well around people and some do not

Some are killed from _____ Some are killed by _____

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Some reduce their range by _____ humans.

Some are poisoned by _____ or purposely to kill predators.

Putting all the factors together

Species A: small, large range, omnivore, moderate biotic potential, many human interactions

Four _____ & one negative factor. Is Species A at risk?

Species A: _____ _____

Species B medium size, large range, omnivore, very high biotic potential, many human interactions

Four _____ & one negative factor. Is Species B at risk?

Species B: _____ _____

Predictions are not always easy

The _____/ human interactions involve feeding.

The _____ / human interactions involve killing.

BUT, in general, the more _____ factors,

the more _____ the species is to be in trouble.

work on endangered species questions

HUMAN THREATS TO OTHER SPECIES

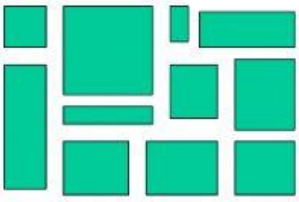
1. HUMAN POPULATION GROWTH

-humans directly compete with other species for _____ and _____

-more humans means more _____

2. HABITAT FRAGMENTATION





a single large area of _____ the same area broken up into _____

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EFFECTS OF HABITAT FRAGMENTATION

- this creates barriers for _____

- the _____ [vegetation is different for the outside 10 – 30m due to available light]

different _____ means different food and nests

- fragmented habitat gives introduced _____ more access to the habitat

3. HABITAT LOSS

- not all habitat is _____

- some habitats are more _____ than others

-these are classified as _____ areas or Biodiversity _____

A. WHAT ARE WILDERNESS AREAS?

-only areas greater than _____ km^2

-at least _____ percent of original vegetation

-less than_____ people / km^2

WHERE ARE THE WILDERNESS AREAS ON EARTH?

-there are _____ Wilderness Areas

-they include habitats on every _____, ranging from the Amazon rainforest to the Sahara desert

- unfortunately, most of the Wilderness areas are in the _____

where there is _____ biodiversity

B. WHAT ARE HOTSPOTS?

-these are the areas on Earth with the _____ biodiversity per square kilometer

-there are _____ biodiversity hotspots

-they contain _____ percent of all plant species

LIVEWORKSHEETS

and _____ percent of all terrestrial vertebrate species

-they only occupy _____ percent of the planet's land area.

WHERE ARE THE HOTSPOTS?

most biodiversity hotspots are in the _____

The Wilderness area do not _____ very much with the Hotspots.

C. What are endemic species?

Any species _____ found in one area is said to be ENDEMIC to that area.

These ENDEMIC species may be found only on a single _____

or _____, in a single river or _____.

Why are there endemic species?

-they are not capable of _____ great distances to other suitable habitats

-their _____ requirements are only met over a small area

Why do hotspots have so many endemic species?

-they have _____ environment

-they have lots of _____

-they have been _____ for long times and the result is lots of endemic species

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