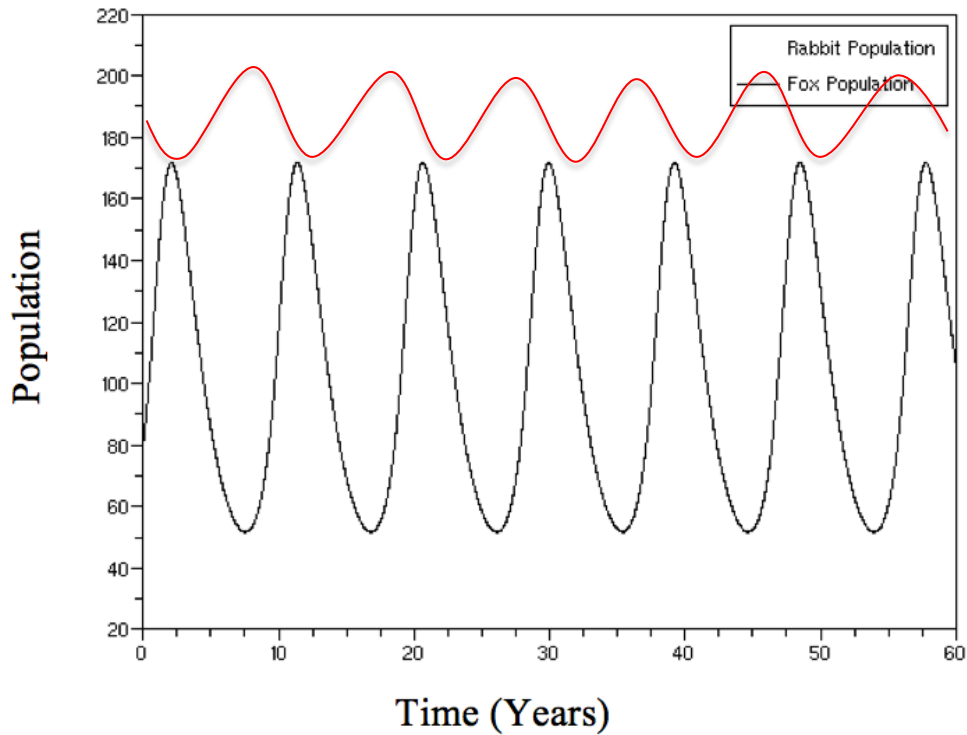


1.



a)

It is possible to draw a few different variations on what the rabbit population might do. I have shown you mine in red and reasoning is below in b).

b)

Rabbit numbers are higher, so they are higher up on the y axis. As the fox population begins to increase, the rabbit population begins to decrease as a result of predator-prey relationship. As there is less rabbits, the fox population starts to decrease, and this allows another population increase in the rabbits.

c)

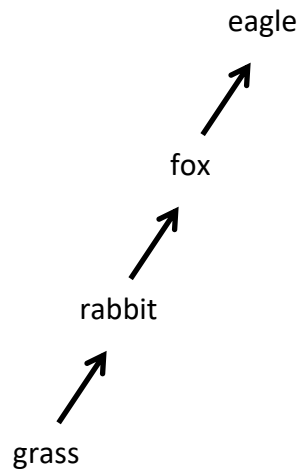
Predator-prey

d)

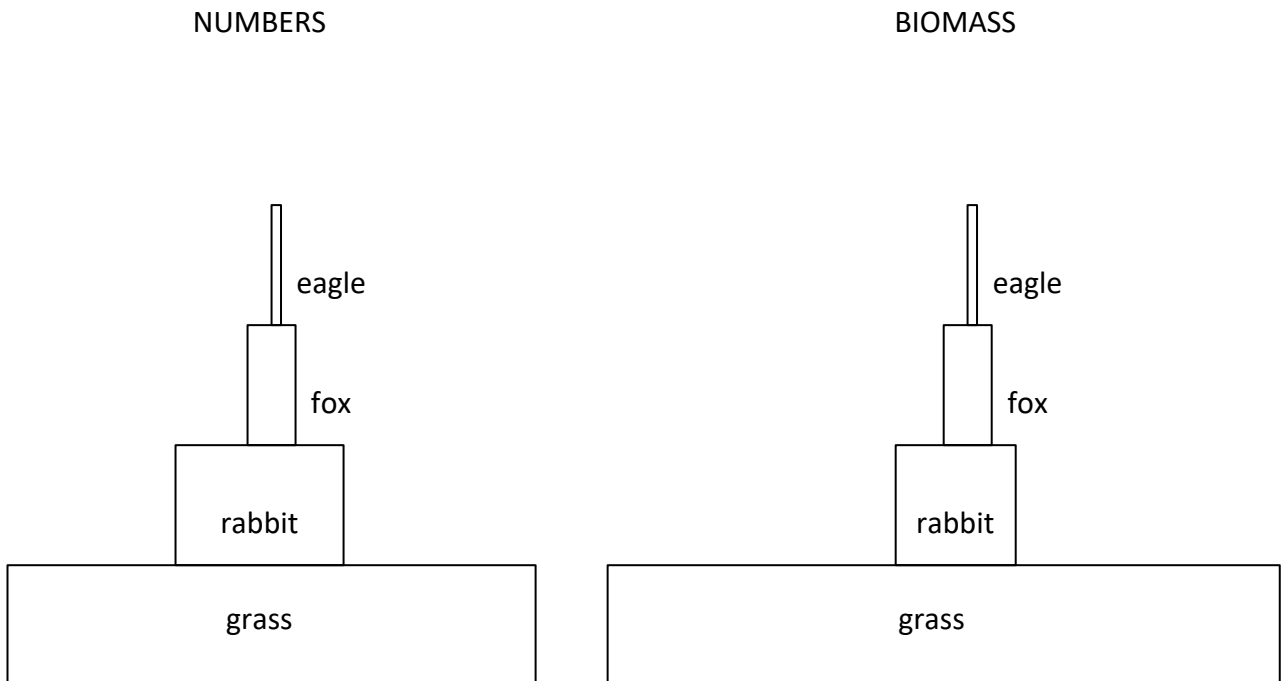
Human trapping – foxes may be trapped in different years or seasons which decreases population.;

Foxes may be affected by season or **years of drought** – this also could decrease the population by decreasing available prey.

e)



f)



These two pyramids will be very similar to each other, as the number of organisms in each trophic level corresponds relatively to the dry weight of tissue within that trophic level.

g)

What the townspeople have done is removed one of the top predators in the food chain. This sudden removal will have dramatic effects particularly on the trophic level below the fox. The rabbits are normally kept in check by the foxes, but with the foxes gone, the rabbits will dramatically increase. This may have an impact on the lushness of the forest, as much of the grass will be grazed much more quickly.

h) *GRAPH – the rabbit population should be shown to dramatically **increase** in your graph over 20 years, and then reach a new stable level that is much higher in population [REDACTED]

i) fast reproduction means that the species can overrun and dominate a habitat before other species have a chance to populate. This can have negative consequences for Australian ecosystems because the rabbits will reproduce so fast that they end up overgrazing grasslands and over using all of the other available resources. This pushes out other native species due to **competition** [REDACTED]
[REDACTED] As a result **biodiversity** can be lowered overall.

2.

Biotic = small hearty shrubs; competition for shelter

Abiotic = sand/soil quality; high intensity of sunlight

3.

Advantages

- Allows for international collaboration
- Avoids confusion caused by common names (that are less specific)
- Allows scientists to identify relationships between living things based on their name
- It is very precise

Disadvantages

- It is cumbersome and complicated
- The names are not easily read – not in english

4.

Autotrophs are the organisms that actually produce food and energy in a usable form to higher levels in the food chain. They do this by producing complex molecules of carbohydrates (like sugars). As this is produced, primary consumers can eat it and make use of it.

5.

This means that he has two possible places in the food chain. Firstly he could be classed as a secondary consumer if he eats small fish that eat algae in the ponds. Or he could be a tertiary consumer if he eats other smaller birds, who also eat the fish that eat the algae.

6.

Without the sun, there would be no food web. The reason is that all energy in any food web can be traced back to the sun's energy. This starts when the autotrophs make their own food by harnessing the sun's energy through the process of photosynthesis. From this starting point, the energy is passed on in chemical form of food to the rest of the food chain. Without the sun, there would be no food for any trophic level.

7.

This refers to the 10% rule that is a general guide in ecological food chains. As you move up each trophic level, there is a loss of energy (about 90% is lost to body heat, waste, and movement). This means that only 10% of the energy from one level is available for use by the next level that consumes it.

*your diagram could be a pyramid with arrows showing energy lost or passed on.

8a)

- because it is closely connected with so many other species in this food web.
- By removing this organism you will cause a major change in the ecosystem, as many of the populations of other animals will not be kept in check

8b)

This is testing your knowledge of what an ecological niche is:

Grasshopper:

- It will mainly be found low in the ecosystem, on ground plants such as grasses.
- It is in competition to some degree with the snail and the beetle for eating these plants but has abilities to move much more quickly and likely over greater distances to find food. It has a role in keeping the green plants in check as far as their numbers go

- It is a primary consumer and provides food source for all of the secondary consumers.
- **any other ideas about the unique role of the grasshopper in this ecosystem
- You could refer to strata and zone

8c)

The first part of the name gives us the Genus that the grasshopper falls under. This is highly specific, as out of all the categories of living things we immediately know where it fits (and this tells us a lot about it just by knowing its Genus). The second part of the name tells us what species it is within the Genus. This is as specific as we can get with living things in categorizing them based on physical traits and DNA. Just by knowing its Genus and species we know many things about it physically.

9

They likely have pre-zygotic isolation:

- different reproductive anatomy
- different mating seasons

Environmental Issues

10a)

Species diversity

- the fire would have reduced the amount of animal species in the area – may have killed various birds and driven out other animal populations.
- The fire would have eliminated some species of plants in the area by burning them all

Genetic diversity

- The fire may have reduced various populations of plants and animals – this would have reduced the overall gene pool as there are fewer members in the populations. This would mean that there is less variations in the alleles than before the fire. This makes those populations that remain more susceptible to disease and extinction.

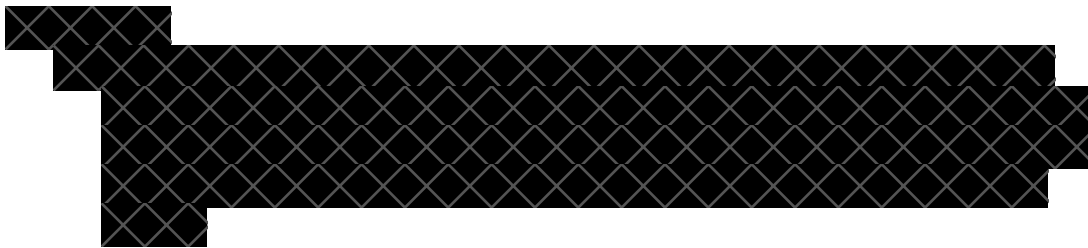
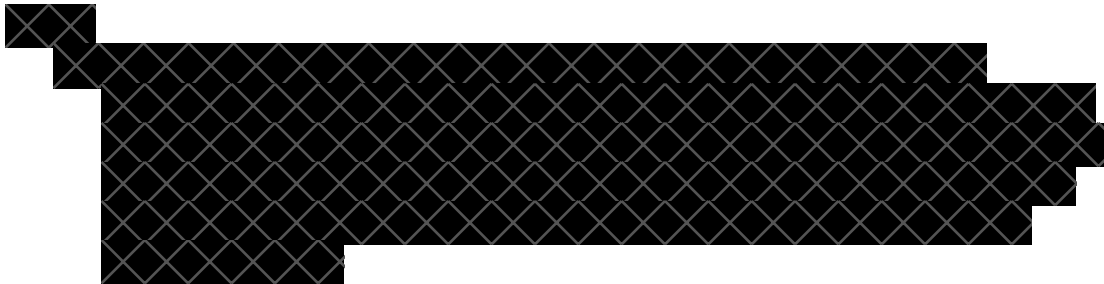
Ecosystem diversity

- This fire may have impoverished or completely decimated a certain type of ecosystem in the area as a whole. This means the region will have less types of ecosystems and therefore less health and biodiversity overall.

10b)

Secondary succession

This is when a community is reduced to only the soil that was present. The vast majority of plants and animals are no longer supported here so the biodiversity is low. Over time, the seeds that might remain can take root in the soil and other seeds may be brought by wind and animals. These slowly grow as pioneer species (grasses, etc.). Over time, larger species can begin to take root – and this invites other animals and insects. This process continues until the community is able to reach the climax community once again with lots of biomass and biodiversity.



11a)

- Because the mangroves are a key region of biodiversity. If you lose the mangroves you reduce overall biodiversity.
- The mangroves may act as a buffer to keep the water run off from the industrial area into the ocean clean
- Possible other reasons...

11b)

- Pollution – from the industrial areas may be getting into the water
- Habitat destruction – cleared areas that were once connected to the mangroves.
- Islandization – this patch of mangrove is now completely disconnected from any other patch of mangrove or natural coastal area.