

Predators

Season Four, Episode Two

This episode discusses the complicated relationship that humans have with their native carnivores. For so long, humans have actively hunted and eliminated our native carnivores, leaving behind ecosystems in dire need of that natural control mechanism. Now that meso-predators (smaller predators such as bobcats, coyotes, which fill the ecological role of larger now absent apex predators) have begun to take over that role, and certain carnivores are moving back into their historic ranges, predator management is a highly contentious issue. Finding a way to coexist with these species is absolutely essential, both for human safety and welfare but also for habitat and ecosystem health as well!



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Key Concepts Watch-Along

Large predators can be challenging for biologists to study. Dr. Kelly offers a few examples of methods she uses, name two: _____

In Dr. Kelly's study, _____ foxes are almost completely absent from the area in which they used to live. Now, researchers seeing occasional _____ foxes instead.

As Europeans were spreading across North America, _____ were seen as a threat to humans and livestock. Populations of these species have been dramatically impacted by hunting.

A few hundred years ago, the eastern U.S. was dominated by _____, _____, and bears. Though black bear populations have recently rebounded, the other two species have been mostly replaced on the landscape by _____ and _____.

Human-wildlife conflicts can arise when predator species kill or harm _____ or _____ that belong to people. Creative solutions are necessary for preventing these occurrences and finding ways to coexist with these important species.

Coyotes colonized Virginia in the late _____. They are not native to Virginia, but populations spread here naturally as a response to habitat loss and elimination of competing predator species.

_____ are native to Virginia and populations are increasing, but they are very secretive and tend to avoid humans.

Humans can avoid attracting predator species near their homes by securing food sources and attractants such as _____, _____, and _____.

Lethal predator control and wildlife killing contests [are / are not] effective means of managing coyote populations because they destabilize the social structure and create conflict. Surviving coyotes increase reproductive rates to compensate, resulting in rapid population rebound.

A variety of animals can be used to protect livestock from predators, including llamas, donkeys, and dogs. For protection of herding animals, such as sheep, _____ and _____ can be ineffective, since they have trouble distinguishing between herding dogs (which are often present and not a threat) and coyotes (which are a threat). For this reason, _____ are often used, including at Shamoka Run Sheep Farm.



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Key Concepts Watch-Along Answer Sheet

Large predators can be challenging for biologists to study. Dr. Kelly offers a few examples of methods she uses, name two: Remote Cameras, Genetic Sampling, Acoustic Detection

In Dr. Kelly's study, red foxes are almost completely absent from the area in which they used to live. Now, researchers seeing occasional gray foxes instead.

As Europeans were spreading across North America, large predators were seen as a threat to humans and livestock. Populations of these species have been dramatically impacted by hunting.

A few hundred years ago, the eastern U.S. was dominated by wolves, mountain lions, and bears. Though black bear populations have recently rebounded, the other two species have been mostly replaced on the landscape by coyotes and bobcats.

Human-wildlife conflicts can arise when predator species kill or harm livestock or pets that belong to people. Creative solutions are necessary for preventing these occurrences and finding ways to coexist with these important species.

Coyotes colonized Virginia in the late 1970s. They are not native to Virginia, but populations spread here naturally as a response to habitat loss and elimination of competing predator species.

Bobcats are native to Virginia and populations are increasing, but they are very secretive and tend to avoid humans.

Humans can avoid attracting predator species near their homes by securing food sources and attractants such as trash, pet food, and bird feeders.

Lethal predator control and wildlife killing contests [are / **are not**] effective means of managing coyote populations because they destabilize the social structure and create conflict. Surviving coyotes increase reproductive rates to compensate, resulting in rapid population rebound.

A variety of animals can be used to protect livestock from predators, including llamas, donkeys, and dogs. For protection of herding animals, such as sheep, llamas and donkeys can be ineffective, since they have trouble distinguishing between herding dogs (which are often present and not a threat) and coyotes (which are a threat). For this reason, guard dogs are often used, including at Shamoka Run Sheep Farm.

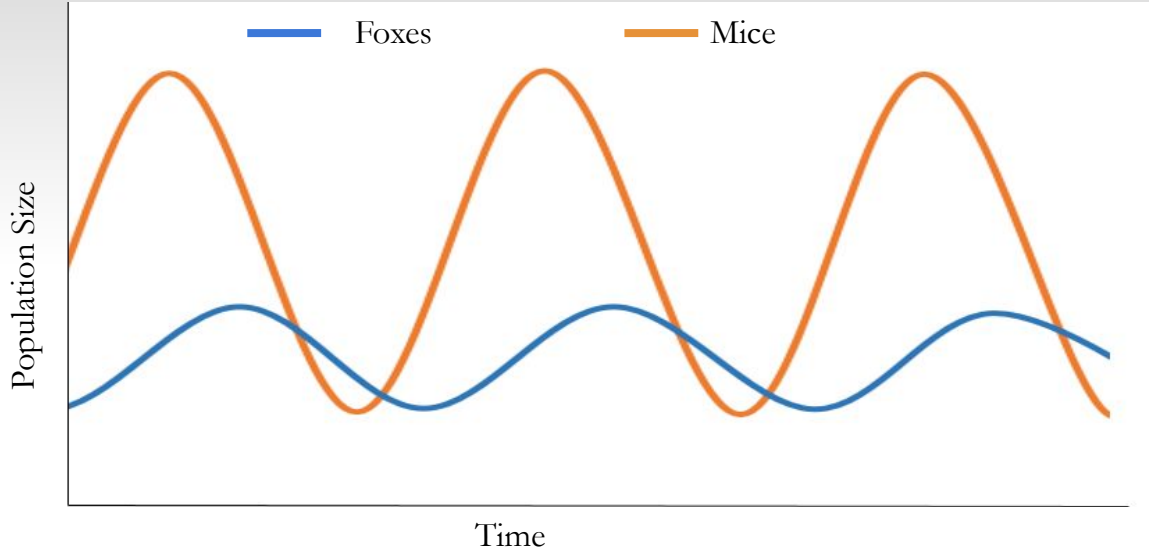


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Predator-Prey Population Dynamics Classroom Discussion



This graph shows the relationship between predator and prey populations. In this scenario, the predators are foxes and the prey are mice. Predator and prey populations keep each other in balance, as one population experiences changes, the other population responds.

Describe what happens to the mouse population as the fox population increases. Why does this happen?

What happens to the mouse population when the fox population is high?

What happens to the fox population when the mouse population declines?

Can you think of an example of an outside influence that would affect either fox or mouse populations? What might happen to our graph if this outside influence was present?

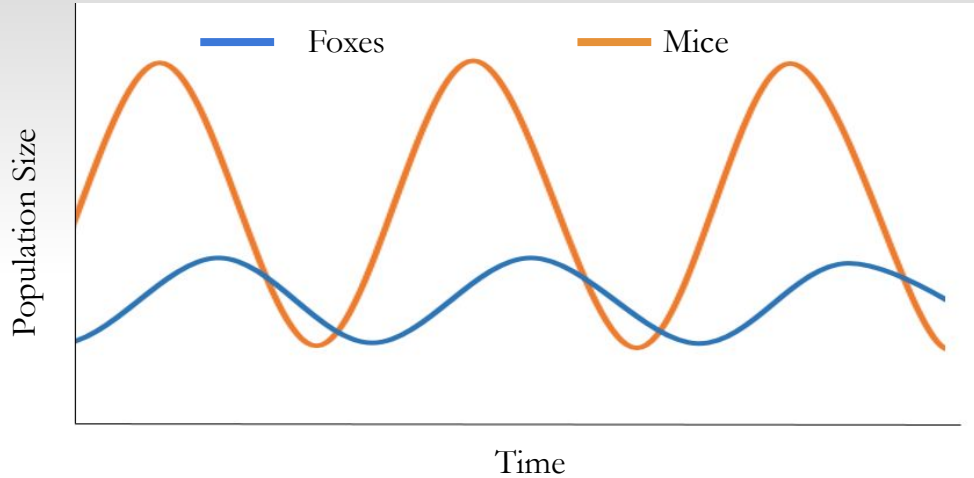


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Predator-Prey Population Dynamics Classroom Discussion **Answers**



This graph shows the relationship between predator and prey populations. In this scenario, the predators are foxes and the prey are mice. Predator and prey populations keep each other in balance, as one population experiences changes, the other population responds.

Describe what happens to the mouse population as the fox population increases. Why does this happen?
Both populations are increasing and then the mouse population starts to decline. During the time that both populations are increasing, neither one is having a limiting impact on the other. The fox population is growing but the mouse population is large enough relative to predator populations that the rate of predation is not impacting mouse population growth.

What happens to the mouse population when the fox population is high?
When the fox population is high, the mouse population begins to decline. Foxes are eating mice at a higher rate than mice are reproducing, so predation is now creating a limiting effect on the prey population. This happens because the rate at which mice can reproduce and grow their population becomes outweighed by the number of predators (foxes) that are consuming them as prey.

What happens to the fox population when the mouse population declines?
In response to the decline in the mouse population, the fox population also begins to decline. At this point in the timeline, mice are being subjected to over-predation by foxes. There are too many fox predators in the environment for the prey population to support. As a result of over-predation, the mouse population declines steeply, making prey less available for hungry foxes. Some foxes cannot get enough food to survive or are less successful with reproduction, creating a limiting impact on foxes and causing the fox population to decline in response to the decrease in prey availability. Once the predator population decreases to a certain point, the prey population is able to return to a growth phase.

Can you think of an example of an outside influence that would affect either fox or mouse populations? What might happen to our graph if this outside influence was present?

An example of an outside influence that would affect either fox or mouse populations would be an additional predator or animal that affects both mice and foxes, either through predation or territoriality. Other outside influences could include habitat loss for both species, or the use of rodenticides or pesticides.



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