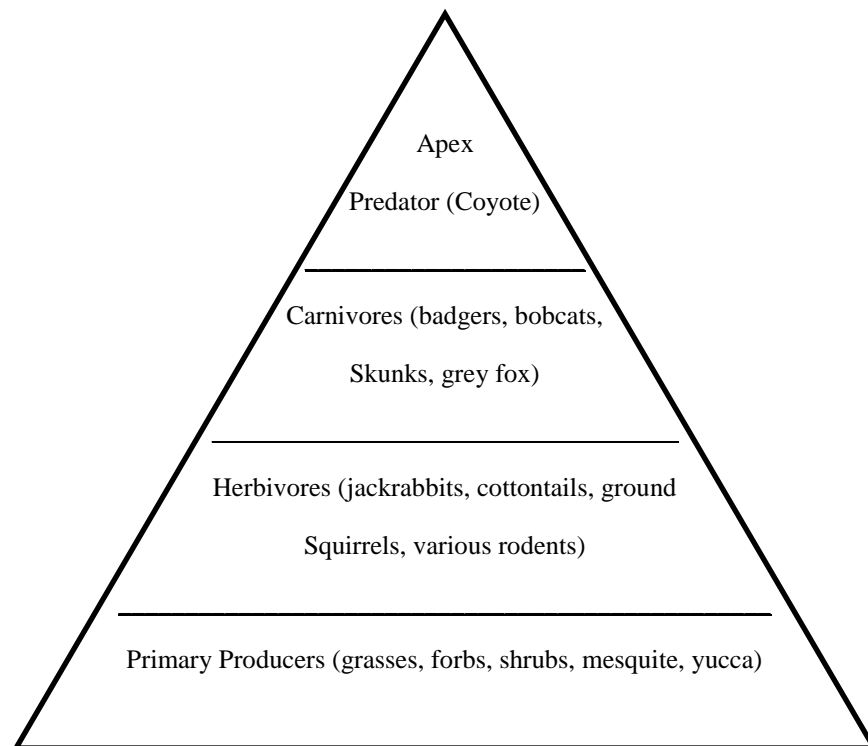


Part 1

In this project, I hope to find out if the absence of the coyote, a keystone species, will hinder the environment or benefit it. In order to answer this question, I will perform the experiment by splitting the West Texas area into two groups: one in an unaltered state and one where the coyotes would be migrated away. Both will be isolated from each other, to prevent any flaws in the process. During the experiment, information will be recorded regarding the population of mesopredators (badgers, bobcats, skunks, and the grey fox), herbivores (jackrabbits, cottontails, ground squirrels, and various rodents), and primary producers (grasses, forbs, shrubs, mesquite, and yucca). If any change, positive or negative, is noticed, then a conclusion will be drawn.

Part 1B

Part 2

The design used in the study will be comprised of two isolated, bordered areas that require monitoring: one control environment (unchanged), and one altered environment (with coyotes taken away) that are at least 5 km away. The experiment will be monitored and recorded in the beginning of the experiment, and 1-2 years after, populations will be recorded again. I predict that 1, herbivore populations will falter due to overpopulation of mesopredators and starvation, and 2, the plant population will lower due to overpopulation of herbivores.

Part 3

According to the displayed graphs, the disconnection of coyotes from the ecosystem has posed a risk of overpopulation towards mesopredator and rodent populations, with communities increasing in numbers compared to the control area, which is, expectedly, unchanged.

According to part IV, rodent biomass (population) increased in large amounts, then receded to a stable count after the first year. My prediction is that due the rising of mesopredator populations, which is shown in part III, rodent populace dropped. The population's peak happened at around the time the rodent population decreased, which evidences that the removal of coyotes triggered an overabundance of mesopredators, which led to excessive hunting of rodents, their main food source. This explains why both populations regulate after the first year.

Part 4

I think the primary factor of controlling rodent population growth, as stated above, is the rising mesopredator population. Because of rising food demands due to sudden overpopulation,

more hunting is involved than usual. This rise in consumption dramatically affects rodent population within the first year of the exclusion of coyotes from the ecosystem.

I expect that rodent populations will soon decrease dramatically due to overpopulation, which leads to more demand in food. If food sources drop for this reason, then a decline in numbers will be evident.

Part V

The success of Ord's Kangaroo Rat dramatically changes: rodent diversity decreases after coyotes are taken away. Because of this, I have inferred that due to the Kangaroo Rat's dominant traits, it has managed to survive despite rising mesopredator populations. This event is an example of natural selection.

The coyote's absence has created dramatic effects in the experiment, which leads me to believe that they are the keystone species, or the supporting pillar, of the community.

One possible cause for rodent diversity decline in the control area could be due to the division of the West Texas area into two groups. This separation of the ecosystem might've affected the amount of species in each group, which, for example, could've moved the Ord's Kangaroo Rat primarily into the treatment area.

Brandon Tran

Per. 1

9/11/14

3565 Sandrock Road
San Diego, CA, 92123
9/13/14

John McJohn
9259 John Avenue
Johnstown, PA, 52956

Dear Mr. McJohn,

Hi, my name is Brandon Tran of the Texas Ecosystem Research Group, and I am writing to you to address my findings on the effects of coyote removal in the West Texas ecosystem. As a representative of The Nature Conservancy, I believe you'll be pleased (and surprised) to know that coyotes, indeed, play a vital role in the ecosystem as a keystone species, and that our findings show that rodents and other small animals would be overabundant without them.

Because of the removal of the coyotes, mesopredator (and rodent) populations increased, due to the animals not having a predator. This, in turn, decreased rodent population due to rising demands for food. However, with this conclusion, you may ask – what should we do to coyote populations now?

Because of the repercussions that were evident due to this change, such as less species diversity and overpopulation, I would advise to prevent any additional coyote hunting, which could lead to ecosystem imbalance. I would also advise to inform the people living in the area to take defensive action, such as building barriers or creating a sort of repellant to deter these predators.

I hope this info is as useful to you as it was to me.

Highest regards,

B. Tran