Case Study: Coyote Removal in Texas

Part I:

1. Through environmental experimentation I expect to determine the effects that removing the apex predator (Coyotes) will have on their local environment.
2. We will use areas of land for control groups (untouched) and experimental groups (coyotes removed).
3. We intend to monitor the change in biomass of each trophic level. Namely, we will monitor how plants, herbivores, and meso-predators will respond to the removal of the coyotes.

Part II:

1. A. The meso-predator biomass will dramatically increase.

B. The primary producer (auto-troph) biomass will dramatically decrease.

Part III:

1. The data collected from the treatment sites illustrate a dramatic increase in the meso-predator populations relative to the control groups.
2. The rodent population most likely decreased dramatically due to the rising population of their predators. (This over-consumption of rats may or may not affect the vegetation in the treatment sites.)

Part IV:

1. The primary factor controlling the rodent population is the presence of meso-predators in their environment. With the removal of apex predators (Coyotes) the rodents bred rapidly, as evident in the fall of 1990. They were then consumed by the rising number of meso-predators and reach their equilibrium within about a year.
2. The rodent community will most likely find an equilibrium point between its available vegetative resources and its predators.

Part V:

1. The Ord’s kangaroo rat is performing particularly well in its environment as illustrated by the decreasing biodiversity of the observed population in the experimental groups. This indicates that the species is adapting to its environment and is forming a superior community, as the relatively less fit are consumed more rapidly than those with an advantage. Ergo, this is indicative of a competitive improvement in the species itself.
2. The coyote appears to have been keeping the meso-predator population dramatically in check while simultaneously over-consuming the Ord’s kangaroo and preventing the species from realizing its full potential as an evolved community.
3. The decreased bio-diversity in the control groups after the treatment groups began could be explained by the movement of predators between the control and experimental groups, altering their command/consumption structure.
4. I would explain that the coyotes occupied a niche that prevented the evolution of the Ord’s kangaroo rats and dramatically reduced the biomass of the meso-predators as a whole. I would also add, however, that the dramatic fluctuations in the populations of meso-predators and primary consumers could have unpredictable effects on the vegetation and auto-trophs in the area, this is a flaw in the experimental design, in my opinion.