**Abstract**

This study investigated the populations of deer mice in Julian Price Park which is located on the Blue Ridge Parkway, Watauga County, North Carolina. I wanted to investigate the number of mice that were caught over the years in this area and examine if there were any differences between the years, habitat, and population structure. To capture these small mammals, common traps were used. I found that the deer mice population varied greatly from year to year, and also loosely follows the weather; as the temperatures rise the amount of mice that are caught appears to go down, and as the temperature drops the amount of captured mice appears to rise. This makes sense because when it is hot outside animals do not like to move because it wastes energy. Another interesting note is the amount of males that were captured compared to the amount of females. About four males were captured for every female captured. Perhaps the most interesting thing I found out in my study was that there is nearly no correlation between the amount caught in the uplands and the amount caught in the lowlands; it changes from year to year. In some years there will be as much as five times as many found in the lowlands compared to the highlands, and then the very next year it will be the opposite.

**Introduction**

Deer mice: something so small yet so vital to the type of habitat in which I have been conducting my research. Many people think that the main parts of the forest are the big animals, such as bears, deer, or hawks, but it is actually the smaller things that keep the entire community running. I decided to do my research on the difference in the deer mice populations in the uplands and the lowlands of Julian Price Park. At the start of my research, I predicted that there would be a distinct difference year after year in the number of deer mice that were captured in

the uplands and the lowlands. I set about doing this by capturing these mice and then returning them back into the habitat. In the study a very basic technique was used: trapping. This proved to be relatively easy and very successful. In the end I realized that my prediction was incorrect; the elevation and topography doesn't seem to effect the population of the deer mice.

**Materials and Methods**

Trapping is a surprisingly simple process that, if done correctly, can result in magnificent amounts of animals. When we first arrived at the trap site we unloaded the traps and organized them by numbers. This proved to be very useful later on when we started to see results. We checked to make sure that all of the traps were clean and didn't have any signs of the last animal that was captured. We then split the traps into groups of large trap, two medium traps, and eight small traps. The large traps are used to capture bigger mammals, such as raccoons. The medium sized traps are used to capture average sized animals such as rabbits. But the trap that was important to my research was the small trap, the Sherman trap as it is better known. These traps are ideal for capturing small mammals such as shrews, voles, rats, moles, and of course mice. The trap is very simple, yet very effective, as I was quickly shown. The Sherman trap's simplicity allows it to be operated by nearly anyone. Essentially it's just a metal box with a door on the front that can be closed if weight in applied to a lever on the floor of it. This is very effective when a hungry mouse wander into the trap looking for a quick bite to eat. The bottom also folds out so that it is easy to clean and bait. The next step to this process was finding an acceptable location for the traps. This took some time because we wanted them in locations that would be most effective. Putting the traps in good locations either makes or breaks the entire operation. The best places to put Sherman traps are in spots that have plenty of cover; this is the type of place that mice like to roam, because there is a smaller chance of being seen by predatory

animals. While we were finding fitting locations for the traps we also baited them. Bait is the luring substance that draws the animals to the traps. This is another vital piece to being successful in catching animals. For example, if I was to bait the Sherman traps with meat I might not have gotten near as good results as I did when using peanut butter and pieces of oatmeal cookies. These two types of bait proved to work very well in coaxing mice into the traps. After we had all of the traps baited and placed we had nothing else to do but wait until the next day to see if we had been successful in our trapping. Most, if not all, of the animals that are be caught are nocturnal, which means that they will only be caught at night. The next morning when we came back we began checking the traps for any signs of a catch. When we discovered that we had been successful we collected some data about the mice. When recording data, one must be very organized and very thorough so that the data are useful to others at a later time. The first thing we did was put the mouse in a bucket so that it couldn't scurry off. Then we picked it up and measured its length, not including the tail, found its gender, and also took a black or red Sharpie and marked its tail so that we could identify it if we recaptured it on another day. We also noted the type of bait that was used to capture the mouse; this is important because it helps show how effective the methods are. After we collect all of the needed data and marked the mouse to make sure we knew we had already captured it once, we released it back into the wild around the same area in which it was captured. After the mouse was released we cleaned the trap so that there were no mouse droppings or left over bait in the trap; this is important too because it may turn other mice away if it is not cleaned properly.

**Results**

The results of my research were interesting in that the elevation didn't seem to affect the amount of mice that were caught. In 2008 33% more mice were caught in the lowlands than in the

uplands. In the exact same location in 2005, four times as many were caught in the uplands as in the lowlands (figure 1). This indicates that the elevation doesn't have an effect on the amount of the mice that are captured. One factor that did seem to have an effect on the amount of captures was the weather. In 2010 only fourteen mice were captured total, in the uplands and lowlands. The temperature ranged from 67 degrees to 85 degrees; this is relatively hot for the Appalachian Mountains, even in July. On the other hand, in 2009, 68 mice were caught and the temperature was much cooler ranging from 57 degrees to 65 degrees. The temperature was just about the same during the 2008 study and 79 mice were caught. In 2003 the temperature was about medium ranging from 69 degrees to 78 degrees and only 29 mice were caught that year. This shows that the temperature does have an effect on the amount of mice that are captured. Many animals do not like to move too much on a hot day because it causes them to use too much energy. On the other hand, on cooler days they move around because they need to keep warm and also because they do not use near as much energy as compared to a hot day.

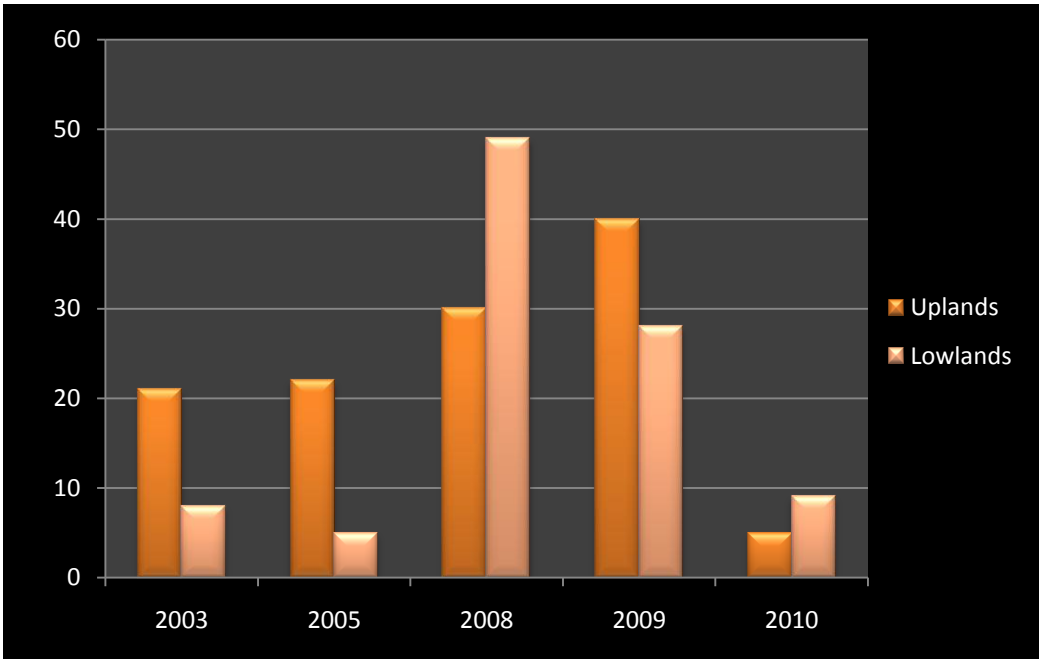


Figure 1. Number of deer mice that were caught in the uplands and the lowlands in the years shown.

There are many things that can cause variability in results. Over the years that were studied, the bait wasn't exactly the same every year. This can cause a big change in the amount of animals caught. Even small things that people overlook sometimes can be a big difference such as using the same brand of peanut butter, or even changing from oatmeal to oatmeal cookies. Another big difference is the placement of the traps. If the group in 2003 placed their traps differently than in 2009 then they could get different results. This could cause a potentially huge problem; if the group in 2003 didn't do a good job in placing the traps and the group in 2009 did, then the amount caught in 2009 would be much higher than in 2003. The amount of males that were caught in 2009 was over three times the amount of females that were caught in 2009. This isn't just in 2009 though, it happens year after year. Why are the males mainly the ones that are attracted to the traps?

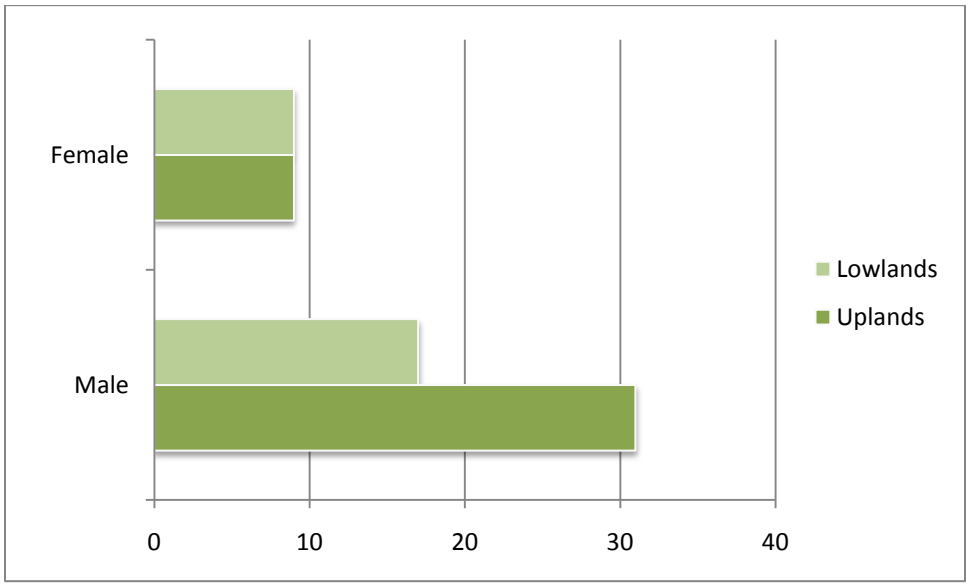


Figure 2. Number of female and male deer mice that were caught in 2009.

## Conclusion

After all of my research and investigation I have come to the conclusion that my hypothesis was incorrect. Because of the unpredictability of the population I have concluded the elevation does not seem to have an effect on the populations of deer mice in Julian Price Park. I have accepted the null hypothesis as correct. My null hypothesis stated that there would be no change in population of mice when the elevation changed, this did prove to be true. The amount of mice captured did change, but it had nothing to do with the topography or elevation, it seemed to be more based on weather and just from year to year. This seems to prove that the null hypothesis is correct.