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IP Methods

**Procedures:**

**Overview**: My team and I conducted our observational experiment at NATL, in the University of Florida, to count the individual dragonfly population in the three different ecosystems: the grassland (old field area), a forest area, and a wetland area. We compared the amount of adult dragonflies (Odonota anisoptera) observed in these areas and the amount of mosquitos (a combination of anopheles, coquillettidia, culex and culiseta) collected, in a 7 day period, in these three environments on three separate testing days.

We started by choosing our individual locations for each ecosystem type. We used a spinner iPhone application to randomly select a direction one of us will walk away from each other to select a suitable area that matched the ecosystem type we were currently testing. We decided to walk for at least 20 meters, but it could be further depending if we could find a suitable location. Once we were in the area for observational testing we each sectioned off a10 m^2 X10 m^2 area with the brightly colored rope and flags. The rope was to establish a solid square where we counted adult dragonflies. These areas were relatively far from each other so that we do not double count the amount of dragonflies. We started at the same time based on the time we completed sectioning off our area. We counted as many adult dragonflies as we saw for exactly 10 minutes. We will only count the dragonflies that fly directly over or in the sectioned area, not near or around.

Each ecosystem had distinct characteristics. The forest areas had a large tree canopy over the dense shrubs on the bottom. It was difficult to move around this area because the undergrowth was so dense. The grassland, or old field, areas had waist high grass, with little to no trees in the sectioned areas. The wetland/marsh areas had few trees with a few inches of water. Any more water in the wetland it would constitute as more the lake that was nearby.

**After area selection:** We used a hand clicker to make sure we were counting the individuals dragonflies correctly and accurately. We did the same counting procedure on the other environment types on the same day. Since there are three of us we will all observe dragonflies at the same time each of us in different environments. To eliminate as much variables as we can we will conducted the experiment a total of three different dates and on similar weathered days. We conducted this experiment on three select days at approximately 5 pm- 7:30 pm.

As well as counting the population of dragonflies in these areas, we counted amount of mosquitos that are caught by mosquito/fly catchers (insect tape trap) in 7 day period. We will set up three mosquito traps on the three days we count the dragonfly populations. Since we are not using attractants to manipulate our experiment we will leave the mosquito/fly traps for an extended time of 7 days. Since we don’t want dragonflies or other insects to get stuck on the mosquito/fly trap we added a custom netting that will only allow for small insects to fly through to get stuck. We collected the mosquito/fly catchers around 8 pm of the last day.

**Calculations:** Once we were done observing the dragonflies and counting the mosquitoes (that were stuck on the trap), we calculated averages and means for each ecosystem and for each day. We recorded the weather of that day to see if we had some observational comparison between the amount of dragonflies and the kind of weather it was that day. We created double bar graphs with a standard error bar. On the bar graph we had the X axis as the habitat and the y axis is how many dragonflies and mosquitos were counted.

We calculated the standard error, for the observed adult dragonflies, using the following steps:

Step 1: Calculate the mean (Total of all samples divided by the number of samples).

Step 2: Calculate each measurement's deviation from the mean (Mean minus the individual measurement).

Step 3: Square each deviation from mean. Squared negatives become positive.

There was defiantly errors in our dragonfly counts because there is no way to know that we counted 100% of the dragonflies that were in the sectioned area.

We also calculated a t-test to compare the dragonfly and mosquito population for the same week and the same area to compare their food chain relationship. Since we are calculate only 2 means we can use a t-test. Also we had a normally distributed data, so a t-test was appropriate.

Our experiment is uncontrolled so there is not a control variable. This was a natural experiment.