

A FIELD STUDY USING SMARTPHONES, GOOGLEDOCS, AND ARCGIS ON-LINE TO COMPLETE AN URBAN FOX SQUIRREL (*Sciurus niger*) POPULATION STUDY WITH HIGH SCHOOL STUDENTS IN WICHITA, KS. By Bill Welch, Wichita North High School, Wichita, Ks 67203.

Abstract

High school student's smartphones in conjunction with googledocs forms, EDGIS geofoms, and ArcGIS on-line enabled the students to collect real population data. Student mapped squirrel nests (dreys) were used to estimate the fox squirrel population in Riverside Park in Wichita, Ks. Squirrel nests (dreys) mean height was 35 ft. There were a total of 21 drey nests found within the 24 hectare park. A nest density of 0.88 nests/hectare, with a squirrel density of 0.44/hectare. The fox squirrel population was estimated at 10 total squirrels in Riverside park. Student interest and active participation was significantly higher when using their cell phones and technology to map the data.

Introduction

In urban park settings there usually is an abundance of trees and wildlife. The presence of fox squirrels (*Sciurus Niger*) could be used to indicate the health of an ecosystem. Fox squirrels make nests using leaves (Edelman, 2005). These nests are called dreys, and they are about 30 cm. in diameter. Most recent literature is specifically geared toward studying Red squirrels and Grey squirrels (Verboom, 1990). Very little research has been conducted using urban settings for fox squirrels. The intent of this study is to determine the population of fox squirrels in riverside park indirectly by using a drey count.



Fox Squirrel, *Sciurus niger*



Drey (squirrel leaf nest)

Results

There were 21 drey nests found in Riverside park. The average height of the drey nests was 35 ft. There were 21 drey nests found in the 24 hectare area of Riverside park, and this gives a nest density of 0.88 per hectare. Based on previous literature (Edelman, 2005), a fox squirrel produces 2 drey nests. The number of fox squirrels in Riverside park was determined by dividing the number of drey nests by two to get a fox squirrel population estimate. Our data (21/2 = 10.5) indicates a fox squirrel population of 10.5 in all of Riverside Park. This gives a fox squirrel density of 0.44 squirrels per hectare. Student interest and participation was determined by using an anonymous Google on-line Google Survey. There were 62 out of 74 students that responded. Student responses indicated that 85% thought using phones to map real populations increased their interest in science.

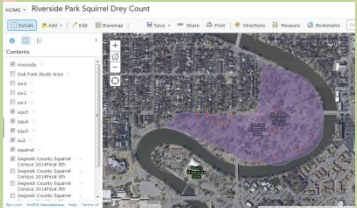
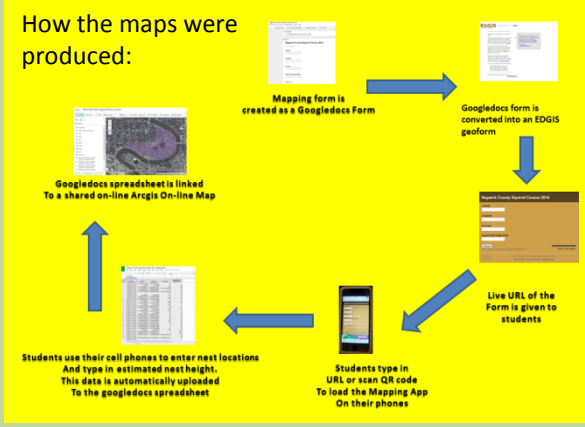
Methods

Students were given a mapping app that allowed them to map the location and height of the drey nests. A mapping app for this study was made using Google Docs Forms and EDGIS website (Palmer, 2013). Students then used the app on their cell phone to stand underneath the nest and estimate the height of the nest in feet. Students submitted each nest location and nest height and it was instantly mapped onto the class nest map on-line (ArcGIS on-line) and in the spreadsheet on Google Docs. Back in the classroom the students used the collected map locations and height to compile the results of the study.



Students mapping nest locations with their phones

How the maps were produced:



Cell phone generated On-line Drey map

Discussion

This study determined that there is a Fox Squirrel density of 0.44 squirrels per hectare in Riverside park. These results are low compared to Red squirrel and Grey squirrel densities found in urban parks. By using Drey counts as an indirect measure of squirrel populations our estimates could easily be slightly higher or lower than the actual populations. One way to get a more accurate estimate would be to trap the squirrels to obtain a more accurate estimate. Tree species were not obtained to determine any species association with tree types. The cell phone GPS units had an average accuracy of 10 ft – which is fairly accurate considering our wooded location. A good follow-up study would ask how Riverside park compares to other urban Wichita parks in respect to squirrel populations. The student survey results did indicate an increase in science interest. It is acknowledged that the increase in interest is predicated on the quality of anonymous survey questions, but overall the students grasped the technology and how it related to their learning about estimating populations.

Acknowledgments

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Literature Cited

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