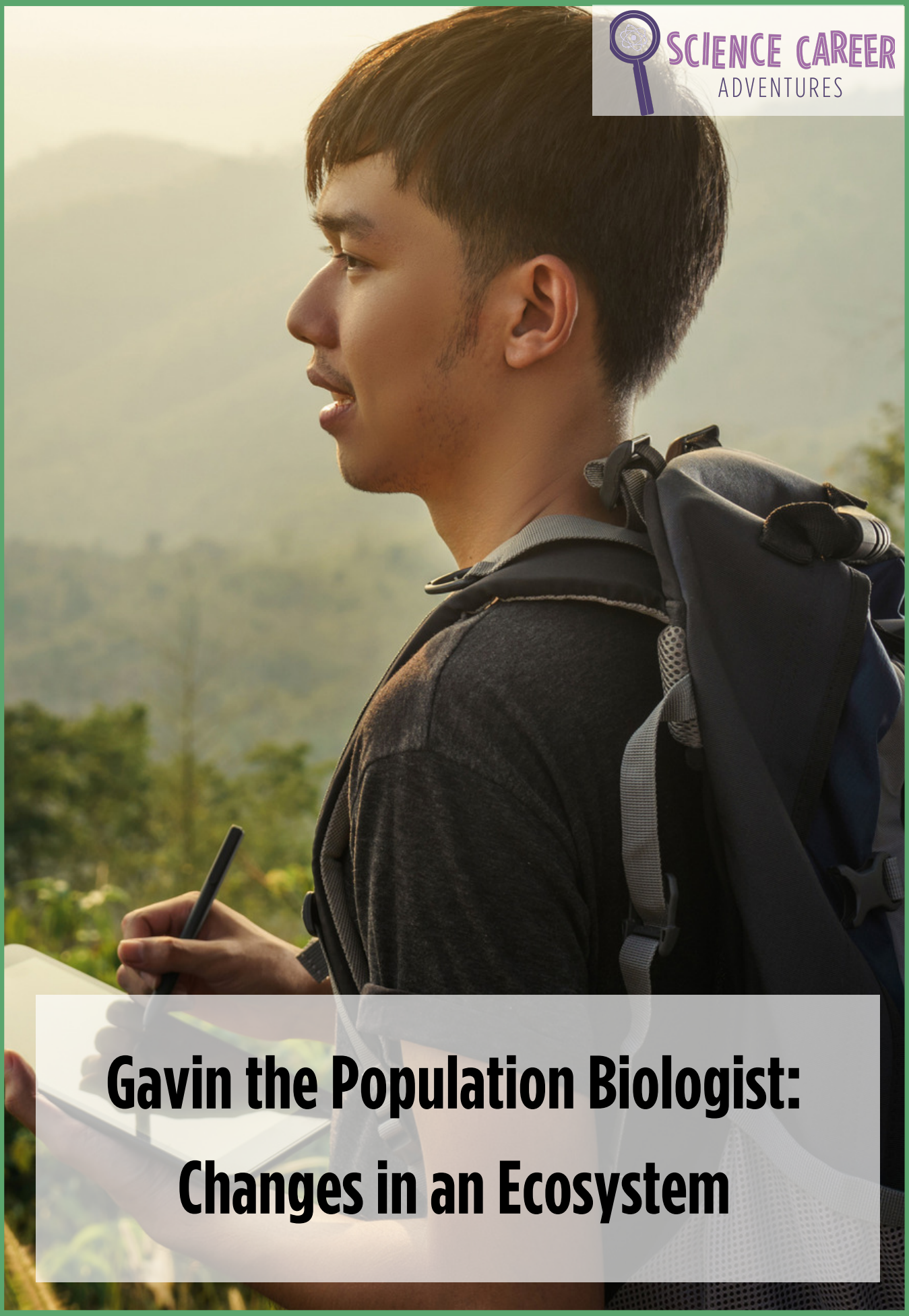


SCIENCE CAREER ADVENTURES

# Gavin the Population Biologist: Changes in an Ecosystem

# Who is Gavin?

Hi! My name is Gavin, and I am a population biologist. As a population biologist, I study the relationship between populations of organisms and their environment. A population refers to the number of organisms that belong to the same species in a certain area.

**Population biologists spend a lot of time working outdoors observing populations in their natural habitat. Here are a few projects that they work on!**

### Studying the effect of invasive species in an ecosystem

Invasive species refer to organisms that aren't native to an area. For example, Zebra mussels are considered invasive in the Great Lakes. There have been reports that these mussels have taken over the water and caused other shellfish to die out. According to the Center for Invasive Species Research, the cost to manage Zebra mussels in the Great Lakes exceeds $500 million a year!

### Conducting Population Surveys

Population surveys refer to data collected on the number of organisms in an area. For example, population biologists might conduct a survey to see how many rhinos are left in an area to see if they are endangered, or close to becoming extinct.

# What I'm Working On

**Population Biologists spend a lot of time investigating different populations of animals. Here are a few populations that you may not have heard of!**

### Dementor Wasp

These wasps sting cockroaches on the head, sending their venom straight to the brain. The cockroaches then act like zombies. They are able to move but not able to decide where they want to move. The cockroaches will walk right into the wasp nest, where they become food for dementor wasp larva that slowly eat away at their organs.

www.washingtonpost.com

### Photorhabdus luminescens

These bacteria live inside of worms. During the civil war, injured soldiers noticed their wounds were glowing! It was later discovered that the worms with the bacteria would get into the wounds. The bacteria are bioluminescent, which means they give off light.

planetnatural.com

### Assassin Bug

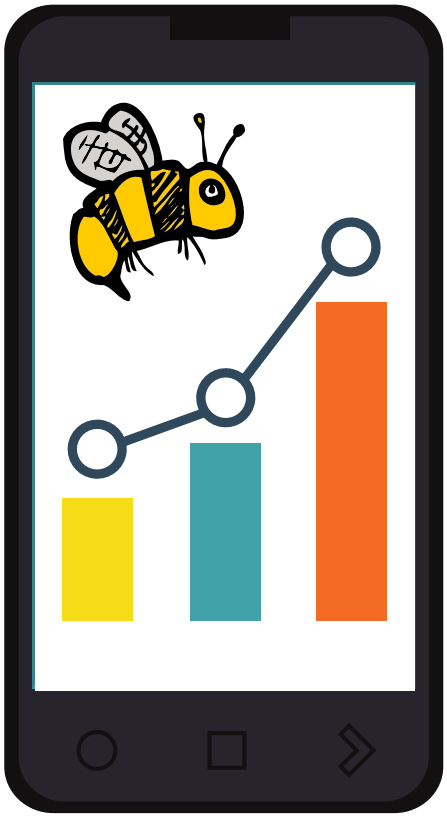
These bugs are also called Reduviidae. They are more commonly known as assassin bugs because once they see an organism that they can eat, and decide to go after it, they almost always kill that organism. There is very little hope for survival if you are an assassin bug's prey.

# What I'm Working On

**Right now, I am conducting a population survey of honey bees in a large city. A few years ago, a bunch of trees and fields were cleared out to build new restaurants, offices, and hotels. As a result, biologists and wildlife specialists decided to build green roofs throughout the city. A green roof is a roof that is covered with a lot of plants instead of just being a regular plain roof!**

Now that the green roofs have been in the city for about one year, I need to collect some data to see if the bee population is increasing. To help collect data for the population survey, I am developing an app that can be used by citizen scientists. Citizen scientists are people who volunteer to collect data for scientific research. Citizen scientists are not professional scientists, but they can help professional scientists a ton!

**The app will also serve as a tool to show citizens that every change to an ecosystem can affect organisms that live there. Over time, the data provided by the citizen scientists in the app will help population biologists estimate the number of honey bees living in the city. If the honey bee population is increasing, we can conclude that the green roofs are helping and that the city should add more!**



# Developing a Wireframe

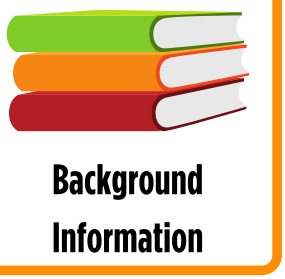
**Today, I am creating a wireframe for my new app. A wireframe includes a series of pictures and words that will show what an app will look like once it is built. Here are some ideas for my wireframe:**

**Opening Screen:**

When users open the app, there will be four different buttons that they can click on!

### #1: Background Information on Project

Users will be able to read information about how to use the app and be a citizen scientist! Users will also be able to watch an animation that talks about why honey bees are important. The animation will show a honeybee pollinating a plant. This pollination causes more plants to produce seeds, which means that more plants will grow. Without honey bees, there wouldn't be as many plants! Then, the world's food supply could decrease!




### #2: Green Roof Map

When users click on this button, they will be able to view a map of the city with the location of all the buildings that have green roofs.


### #3: Submit Data

Users will enter data about how many honey bees they see in a ten-minute period. They can also enter additional information, like the date, time, and weather conditions. All of the submitted information will be compiled into a database for population biologists to analyze.


### #4: Make suggestions

Users can fill out a form to make suggestions about ways to improve the app.

# Gathering Information for App

**Before I release my app, I need to make sure the information will be easy for the citizen scientists to upload. I am going to have a friend test it out to see what she thinks. Here is an example of her completed submission:**

**Name:** Jasmine Otisco

**Date:** March 19th, 2019

**Time:** 11:47 am

**Location:** 1022 Oakwood Street

**Weather Conditions:** Sunny and 75 degrees

**Estimated number of honeybees:** 7

**Addition information (optional):**
I spotted 7 honey bees at the green roof on John F. Kennedy Boulevard and Oakwood.

**Picture:**

# Improving the App

I will continuously improve my app by reading the app reviews by the citizen scientists. For example, citizen scientists might think of an easier way to track the bees they see. Then, I can add their suggestions to the app!


I am so excited to see the finished app. I can't wait to see what all of the citizen scientists upload!