

A bumble bee's grocery list : Measuring floral resources in the landscape

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Have you ever walked down the aisles of a grocery store contemplating what to buy?

As bumble bees fly around the landscape, it's like they're browsing the shelves of a grocery store. They are seeking out flowers to collect nectar and pollen, the floral resources, for themselves and the larvae, the baby bumble bees.

As you may have noticed, flowers are not around all season.

Currently, our best measurements for estimating a good habitat for bumble bees is to count how many flowers are available on the landscape. However, if these flowers don't provide high quality floral resources, it may seem like a good place to live, when it's not.

Bumble bees are ecologically important by pollinating a variety of native and crop plants, supporting plant diversity and crop productivity. In order to conserve the pollination services provided by bees, we need to think about how to best support them on the landscape - and this goes beyond just the number of flowers available.

I'm interested in learning more about how bumble bees choose from the diverse bouquet of resources around them – that is their foraging choices. Are they choosing what is (1) available on the landscape or what is (2) nutritionally valuable?

First, to find out what was available on the landscape, I conducted floral surveys at the UBC Farm and counted all flowers on the ENTIRE landscape! I IDENTIFIED AND QUANTIFIED 34 different species of flowers - with examples on the right side of the slide.

Now that I know how many and which flowers were available, I needed to find out how they were chosen. I captured-then-released hundreds of bumble bees recording the host flower that they landed on. As Bumble bees gather pollen, they collect in their 'pollen basket'. I took that pollen to look at under the microscope. As shown on the TOP left of the slide, the different pollen grains from each bee will tell us what flowers they visited.

Every flower species provides different AMOUNTS and QUALITY of both nectar and pollen. Some flowers provide a high nectar reward, and some provide protein rich pollen. Therefore, I hypothesize that this difference will predict what choices bumble bees make.

Right now, we don't know exactly how bumble bees choose flowers –
Once I've examined my data, we'll have a better understanding of whether they collect food based on the quality of the resources or on what is easily available.

Larvae depend on the pollen as a protein resource to grow big and strong. Therefore, I MAY find that the AMOUNT and protein-content of pollen for different flower species COULD predict bumble bee foraging choice.

By discovering the best way to measure habitats for bumble bees, my research will inform conservation strategies to ensure that bumble bees have access to consistent, reliable, and plentiful floral resources in their environments.