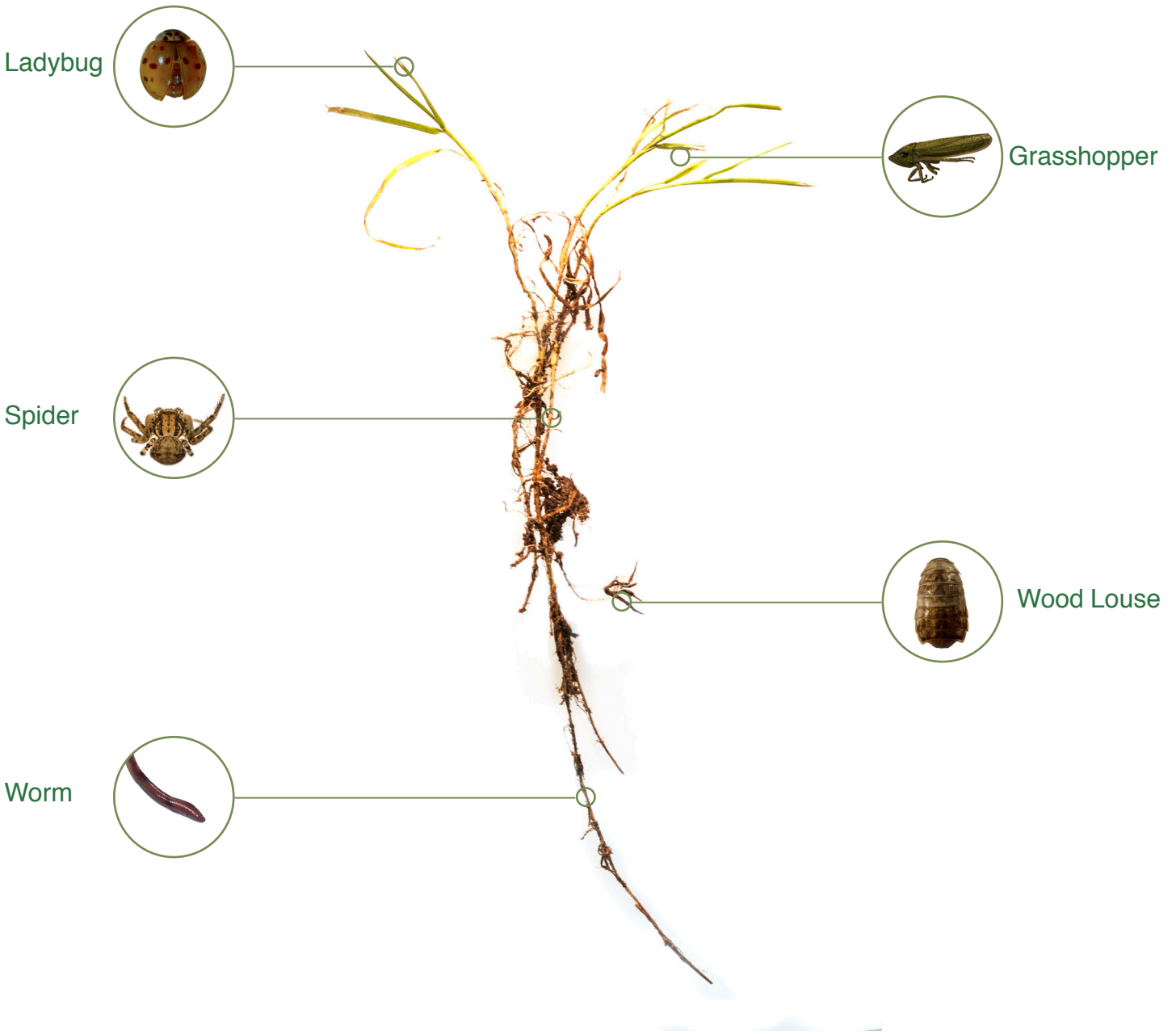
What's in *your* grass?

When you walk across a groomed lawn there are various organisms wiggling below your feet. You may never even notice them, but the grass is their natural habitat. Some of the organisms are bigger than others, but most you cannot see unless you start digging. Grass-dwelling organisms do not like their habitat to be overturned because they lose their sense of direction, so they respond by moving faster and sparatically.

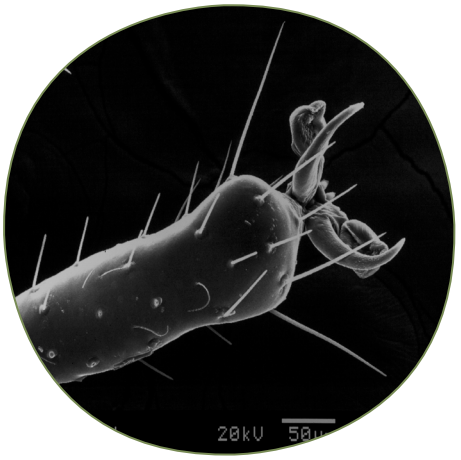
The many types of grass alone offer enough variety in structure so that thousands of insects are able to live it in at one time. However, some types are more efficient than others at retaining a moist and tightly packed environment opposed to keeping a dryer habitat.

Each organism's anatomy is appropriate to whichever level of grass they live at. The bugs that live on the surface of the grass will serve a completely different purpose to the habitat than the bugs very deep in the dirt.

While photographing these live subjects both in and out of their environment, I learned that each insect behaves completely differently when exposed to open air and bright light. It helps to have a variable work space in order to get each specimen to behave for a portrait.



Ladybug *Coccinellidae*



The very nature of a ladybug's outer shell attracts humans because it is vibrant but also harmless. For predators like frogs, birds, and spiders, the ladybug has specific ways to fight them off. They can take flight, however being slightly slower at this than other winged insects. They also can emit an oily substance from their legs that tastes and smells horrible when threatened, in addition to playing dead. All of these actions occur in defense to protect the ladybug from being lunch.

Many natural pests to farmers like aphids and plant-invading insects are taken care of by adding a few ladybugs.

Similar to other tiny insects, the ladybug breathes by absorbing air through tiny porous holes on its outer shell. Although this seems unique, many other insects share the same quality. A ladybug's life can be threatened if it is ever exposed to toxic gases because the holes on it's body will shut and refuse to inhale, eventually suffocating the insect.

Catching and photographing ladybugs isn't difficult because they are slow-moving organisms. In the first image on the left you can identify it's dome wing structure, covered in spots that vary in size and shape. The spots on its wings make each ladybug species different.

The second image was taken with a scanning electron microscope (SEM), at 300x magnification of a ladybug leg. The shape of the claw area is interesting up close and is otherwise not seen in regular macro images.

Grasshopper *Caelifera*

The name "grasshopper" comes from the head shape lacking horns and having short antennae instead. Being herbivores makes their home in the grass a perfect location to thrive. The notorious grasshopper green color and long straight wings mimics the shape of grass blades perfectly so that their location isn't revealed to predators. Leaves, trees and anything from a plant that falls onto the grass becomes dinner for the grasshopper. They are able to travel long distances with their incredible jumping abilities, made possible with their unique legs.

The grasshopper is a undeniably a unique specimen. What is noticeably different about these particular insects is their odd body parts. On their abdomen exists the whole auditory system, comprised of multiple membranes on top of each other. They are capable of picking up faint sound waves in the air from their fellow grasshoppers. It aids in navigation through thick and potentially risky grass regions as well.

The younger form of the grasshopper in the images to the right do not have developed legs yet, and have a premature and soft body. Their movements are sparatic, offering no planned direction to a smaller leaping distance which often times can be confusing to a predator.

Catching this little bug was time consuming due to it's ability to jump completely randomly. However, it has a great deal of trouble standing correctly again from being flipped onto it's wings instead, which allowed me to catch it.

Spider *Agelenopsis*

Spiders that live in grass are speedy and clever. They navigate through the thickest part of the grass right before it meets the dirt level. Their bodies do not allow movement through thick water or dirt so the level of grass they live in enables movement freely while offering protection from the surface.

Small insects that get caught in a grassy mess become a spider's delicious lunch because they can rapidly manuever through their environment and sense insects struggling to escape the grass. Some grass spiders actually make their webs horizontally along the blades of grass for this specific situation. The spider can just sit and wait for it's prey to land on what it thinks is just grass until it cannot move.

This particular spider's appearance is a light and dark brown pattern helping it to move stealthily through the grass and staying out of harm's way.

Before catching this little organism, it is helpful to confuse it by continuing to alter it's direction of movement. They tend to get faster and more aggravated, but ultimately lose track of where they are going and slow down after a few minutes. Bright lights also help to throw their direction off, but be cautious of spiders that are sensitive to this light.

If you manage to catch the spider without hurting it, you can place it in a thin layer of water with diffused lighting for photographing purposes because it slows them down enough to acheive great focus without killing it.

Wood Louse *Oniscidea*

That of the crustacean family, the wood louse resides in the wettest part of the grass structure. To find these tiny creatures you must aggravate the ground beneath the grass, by digging or causing lots of vibrations. They dig hole for themselves in the dirt because they do not enjoy the light of the sun and they need moisture constantly in order to survive.

Since the adult wood lice can have up to 24 babies at a time, often times you cannot spot one wood louse without seeing another. They work better in a team, chewing on wood or plant matter for lunch under the surface of the ground. This becomes an issue when families of wood lice make their way into your home, scurrying around in the wood work and chewing on the wooden beams that hold the house together.

The brown speckled nature of the wood louse's outer shell helps to camoflauge this insect in it's natural habitat. It's difficult to spot these little bugs while they are not moving.

Since sunlight is not something wood lice are usually exposed to, it wasn't easy getting the images of it with a point source light. Instead, I used a really wide spread diffused light source in addition to a wider macro lens to capture the movement of the wood louse in the grass. Patience is also a good quality to have when waiting for the wood lice to emerge from the dirt because they do not move fast unless their environment is damaged or risky.

Worm *Lumbricina*

Worms reside in the deepest part of the grass where the roots end, to be sure that the area is dark and safe for their sensitive skin. It is also the level of grass at which rainwater trickles into, which causes the dirt to be softer and more malleable. For a worm, the wetness of the dirt is a necessity since their smooth, long bodies lack any sort of grip for moving throughout the dirt. Evident in the images to the left, a worm's body is relatively sleek and smooth with tiny ridge-like structures to aid it's navigation. The ridges also serve as legs for the worm, contracting and expanding in an organized manor to move the organism through it's environment.

There are many types of worms that live in grass, but the most common is the earthworm. They are used by fishermen for bait and birds as food.

A worm's internal organs are more complex than expected, consisting of nerves, intestines, three layers of skin, fluid vessels, a mouth and an anus. When they sense threatening vibrations in the ground, they tend to bury themselves even farther down by contracting and expanding their skin muscles very quickly.

The color of the worm's cuticle or outer layer of skin matches the hue of the grass and dirt deep beneath the surface so that they blend in. To make worms emerge out of the top of the grass just use your feet to stomp on the ground.

Speed is essential and should be considered when choosing to photograph worms, because too much light or warmth can dry out their skin and damage their nerves - using a moist area can help. The faster the photo is taken the better for the worm's sake.

Equipment:
Canon 5D Mark III
65mm Macro Lens
100mm Macro Lens
Fiber Optic light source
Copy Stand

Sources:
http://insects.about.com/od/grasshoppersandcrickets/a/10-Cool-Facts-About-Grasshoppers.htm
http://animals.nationalgeographic.com/animals/bugs/ladybug/
http://www.arkive.org/common-woodlouse/oniscus-asellus/
http://animals.nationalgeographic.com/animals/invertebrates/earthworm/

Contact Info.
Lia Rose DiRico
lrdirico@gmail.com
774.270.4218