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# Microhabitats in an Urban Greenspace: Function in the Beauty

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# This project combines science with art, with a focus on microhabitats in a unique natural space in an urban area.

It is set in the Highlands Nature Preserve and the mediums used are photography and digital illustration. The goal of the project is to bring the viewer in from a wide, landscape perspective into a more close and detailed perspective of the multiple microhabitats that exist in the nature preserve. It shows how beauty can be hiding in plain sight for anyone to see if they look close enough. It also aims to show how the beauty is not just visual, but it is also in the knowledge of how these microhabitats function and the unique characteristics that make them microhabitats.

# The Highlands Nature Preserve


The location that was the inspiration for this project and the subject, is the Highlands Nature Preserve. The Highlands is a nature preserve owned by the West Michigan Land Conservancy. It was previously a private golf course, and after being purchased by the Land Conservancy, is in the process of being restored to its natural setting through various ecological restoration practices such as planting native vegetation and installation of wetlands.

It is 121 acres and is in Kent County, in the west side of Grand Rapids, and is open for the public to enjoy and recreate in. I felt that it was a unique location that could show how it would look for a heavily landscaped and man-made environment to return to a more natural setting, which is not seen on such a large scale very often. There are lots of locations within the preserve that are beautiful examples of microhabitats within a changing urban space that this project highlights.

# What is a Microhabitat?

Within larger habitats such as forests or wetlands, there are smaller spaces that hold unique organisms due to the change in humidity, light exposure, or other factors. This could be a rotting log in a forest, a puddle or pond, a unique patch of vegetation, or leaf litter (Nickell, 2017). Like any other habitat, a microhabitat has abiotic and biotic properties that differentiate it from the surrounding habitat.

# Importance of Urban Greenspace

The Highlands is only just one space in Michigan that provides the surrounding urban population a place to recreate and enjoy outdoor space. Parks and natural areas can have many benefits not only to the surrounding population of people, but also the environment and local wildlife and plants. Greenspace can provide social benefits in neighborhoods, possibly increasing the amount of social activity within neighborhoods, providing a place to be social and enjoy outdoor activities (Sullivan et al, 2004). Additionally, including nature spaces within an urban environment can possibly have health impacts such as direct respiratory benefits due to vegetation buffering pollutants from the air, a reduction in obesity due to people using the space for recreation and exercise, or a reduction in stress and having restorative effects (Shanahan et al, 2015).

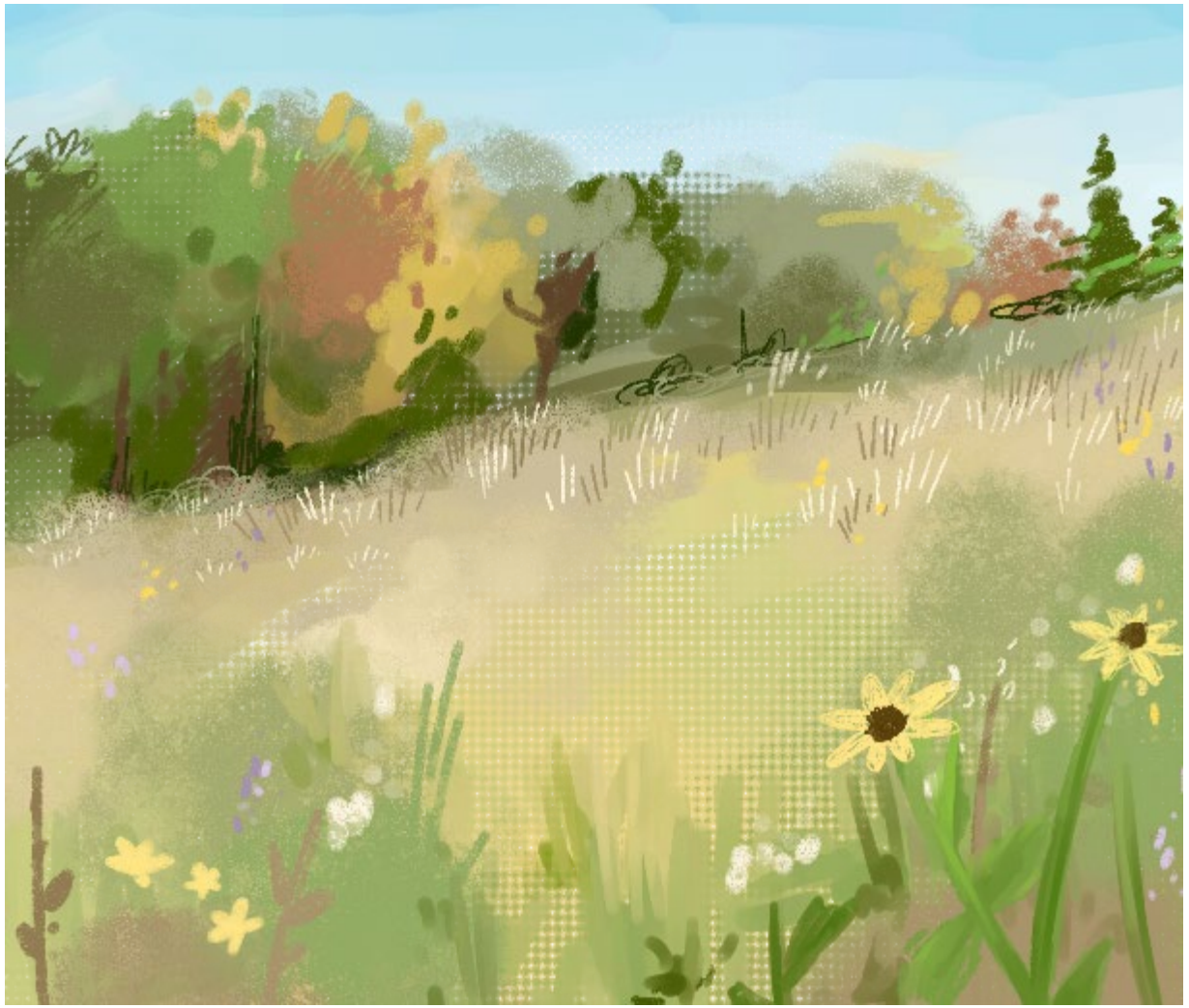
Not only does urban greenspace have benefits for people, it also has benefits for wildlife and vegetation. Having more urban greenspace means that habitats are more connected, and it becomes easier for wildlife to disperse using them. They become corridors for species to reach other habitats when they usually would not be able to if the area were solely urban (Angold et al, 2006).

# Photoset 1: Untouched Meadow

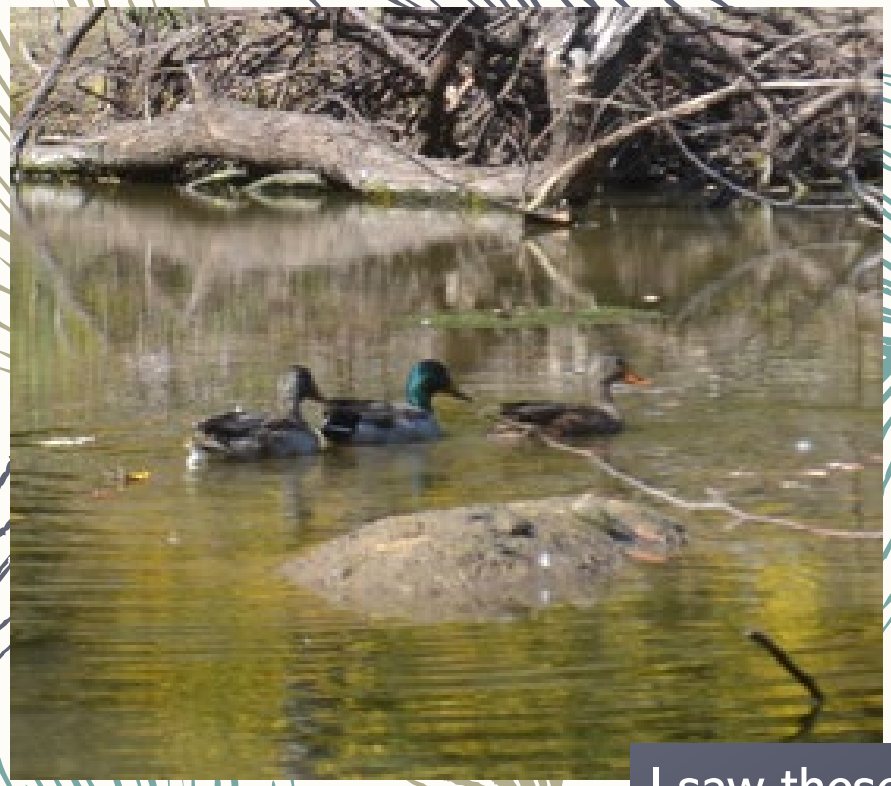
I was unsure of the layout I wanted for this illustration, so I did some very rough, small sketches to decide what I felt would convey the message I wanted. I started out with only the horizon as the focal point, but then I tried focusing in on only the small vegetation but that also was not working out. So, I tried a mix, doing a landscape but with some vegetation in the foreground also taking up focus.

These photos were taken in a low-lying field near a constructed wetland on the preserve. It was open and full of wildflowers and other grasses. This area had yet to be completely touched by the restoration team but was still teeming with life, thick grasses and wildflowers. Openings in vegetation such as this meadow can provide important habitat for insects like butterflies and moths (Valtonen et al, 2007). The same principle can be applied to other urban areas like an unassuming field by a roadway or a vacant lot.

Color was the most important aspect to me as I created this illustration. I wanted to convey the amount of warm and bright colors I could see in the meadow. Between the late wildflowers and the changing leaves, I saw a lot of beautiful colors I wanted to use.



# Photoset 2: Wetlands



I saw these ducks at the same pond at every single one of my visits to the Highlands and it was always a highlight of my trip

– Although these wetlands pictured are purposefully placed, wetlands in urban spaces provide many benefits including supporting biodiversity, mitigating heat, filtering pollution, and other ecosystem services, and could be accidental instead of being created as a management technique (Palta et al, 2017). Such a thing shows how changes in soil and topography can create microhabitats including small urban wetlands that support a variety of wildlife and vegetation.

There were deer tracks all over this area, and it was just one example of the evidence of wildlife utilizing the greenspace

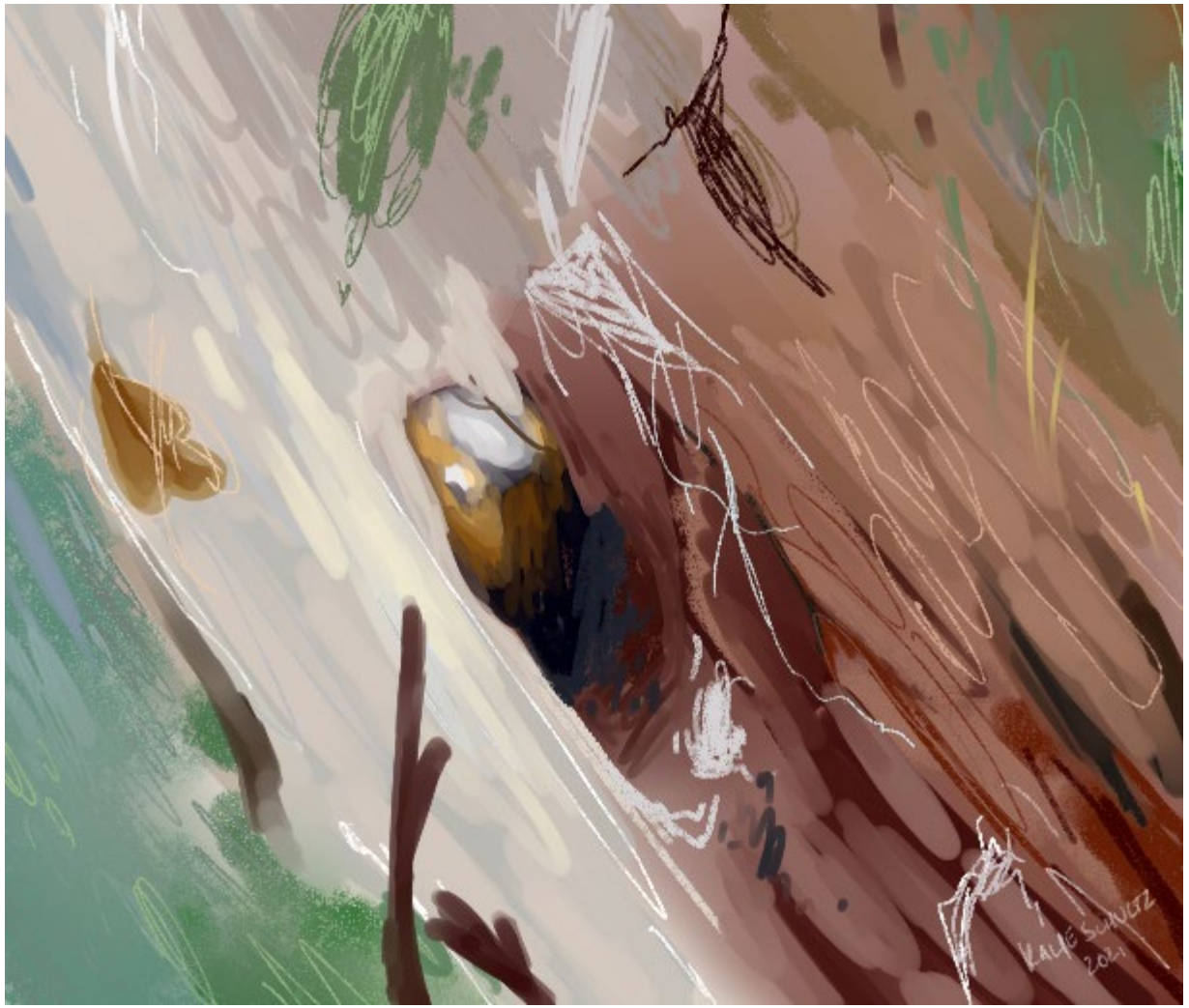
With this illustration, I wanted to capture the use of the habitat by wildlife, as that can be hard to do in person. These wetlands were specifically created by the restoration team and are an ongoing project. Multiple were created around the preserve to serve as habitat for wildlife. The ponds were the area where I always saw wildlife the most during my visits, besides the multiple Mallard ducks. These encounters included a Blue Heron and a Muskrat both utilizing the wetlands.

# Photoset 3: Deadwood

There was plenty of deadwood placed around the preserve, providing plenty of smaller microhabitats and shelter for wildlife. Deadwood creates different patches of habitats as the forest goes through cycles of different trees dying and creating deadwood on the forest floor (Larrieu, 2014).

Trees in a natural environment decay and fall over to create deadwood, which creates different microhabitats for insects and fungi and other organisms, but in an urban environment, trees have less opportunity to do so due to maintenance. If trees are pruned and maintained in a way to allow for decay in cavities, there would be an increase in levels of microhabitats comparable to natural forests (Großmann et al, 2020).

For this illustration, I specifically focused on texture, shape, and color and took a more abstract approach. What struck me the most about the deadwood I was photographing was the variety of colors in one small space, due to the differences in lighting, moss growth, and moisture. It was one of the more difficult illustrations, but I was glad to have chosen to do it.



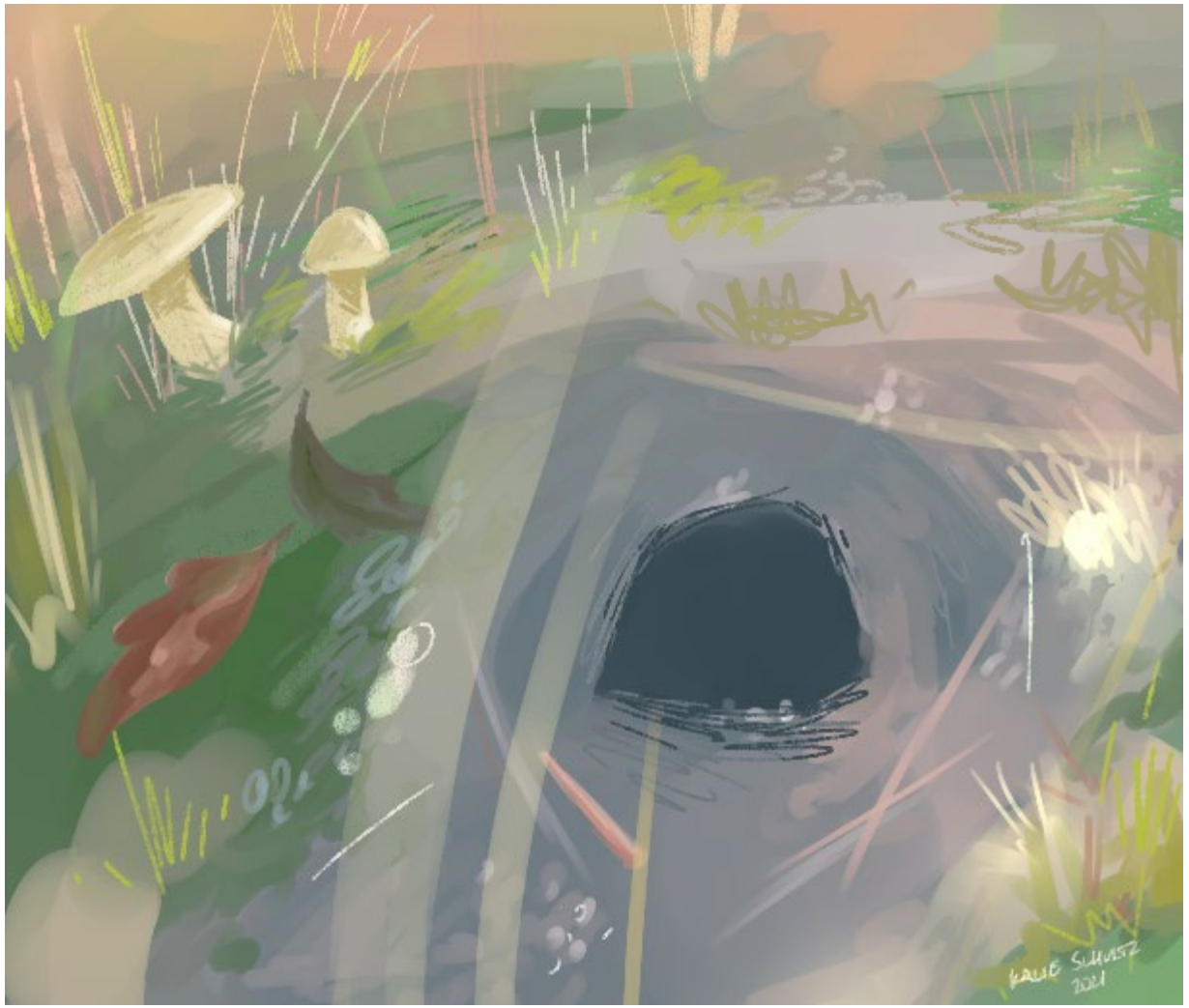
# Photoset 4: Regrowing Sandtrap

In the sketches for this illustration, I did not focus so much on layout, but rather on color and what elements I might include in the illustration

This photo was taken from an old sandtrap that is evidence of the preserve's past as a golf course. The difference in vegetation is evident due to the sudden change in soil that creates a different habitat from outside the sand pit.

This den was found in the sand pit, either from a small mammal or reptile. This den is an example of an even smaller microhabitat. Animal dens form their own microhabitats due to factors like temperature change. Microhabitats can mitigate temperature changes and create areas for more biodiversity (Keppel et al, 2017).

This illustration was not easy mostly due to color and perspective. I struggled with keeping the lighting including more dark shadows while also creating a sandier look to the soil. Using gray tones near the den and warmer colors on the outward edges of the illustration was my strategy to achieve the lighting I saw in the original photo



# Photoset 5: Golf Course Green

This image shows an old golf green from before the property became a nature preserve. This photo shows two different visible microhabitats: the golf green with different vegetation from the surrounding area, and also the leaf litter carpeting the ground from the tree

This microhabitat provides a different type of vegetation than the surrounding area. Compared to the short grasses surrounding it, the soil difference in the golf green harbors taller scrubby grasses that could serve as habitat for wildlife like small mammals and snakes that enjoy tall vegetation as cover.

I wanted to use mainly color and texture to create a contrast between the two areas of tall grasses on the old golf green and the short green grasses outside the golf green. The stark contrast between the two areas is what drew me to photograph the area in the first place. The fact that you could see how the area's previous land use affected how it regrew was very interesting to me.

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