

Becca Anglesey
BIS 241
Field Trip Report
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North Creek Regional Park Field Trip Report

On Saturday, May 19th, I participated in a field trip exercise in which I was led through the North Creek Regional Park wetland area. My trip leaders were Emily, Kristen, and Kadija. Here is a brief recounting of what I learned on this excursion.

Abiotic Environment

The Abiotic Environment of the North Creek Regional Park Wetland was not extensively covered in this field trip, but there were elements that were mentioned. The elevation of the wetland is very low, between 210-230 feet, with an upland area that is not as wet. The upland area has more oxygen, allowing different species of plants to grow there. The soils in the lower part of the wetland are made of peat in the upper layer and a green/grey clay underneath that is often saturated and is low in oxygen. There was also a mention of muck on the surface as well. The site acts as a storm water retention area, helping to reduce flooding in the region.

Biological Communities

This portion of the trip was fascinating! In the park there were very well defined and distinct biological communities.

The higher elevation area of the park consisted of the upland community, which appeared to be a transitional woodland between more densely forested areas and the wetland itself. The

upland portion had several indicator species to denote its dryer soil status, such as Douglas Fir and Red Alder, both of which need more oxygen in the soil to survive. Both of those tree species are also early Seral Stage species, meaning that they begin to grow in a community earlier in the community's development after disturbance.

As we moved down towards the wetland there were other species of plants indicating that the landscape was changing. There were Bracken Ferns, invasive Scotch broom, and Black Cottonwoods. I learned that the Black Cottonwoods are a pioneer species, coming in at the earliest stages of succession. Their seeds are contained in little white fluffs of cotton that help the seeds disperse along the wind. These fluffs were out in abundance. I also learned that Black Cottonwoods tend to grow in places near water and help shape rivers by solidifying the soil along the river beds.

Once we got down into the wetland itself, the distinction between different communities was very apparent. Each different community of plants had very narrow ecotones, and with the assistance of clonal reproduction grew in tight monoculture clumps. I learned that these clumps were a form of succession in the wetland as the different species competed for space.

It was very interesting to see whole groups of Reed Canary Grass, Sedges, Hardhack Spirea, and more. The Reed Canary Grass is a non- native invasive species that is covering about 29 acres of the park! I learned that it can grow in nutrient poor soil and is very hearty which makes it a good competitor. Hardhack Spirea is a native species and is also a wetland indicator species. Hardhack Spirea grow at low elevations and like the soil in the clay layer beneath the peat. It is also a home to birds who use it for shelter in the Winter.

Biological Interactions

I think one of the most interesting things I learned on this field trip is that Scotch Broom, like Red Alder, is a nitrogen fixing plant! Both the Red Alder and the Scotch Broom have a nitrogen fixing bacteria that lives in their roots, representing a mutualism. The plants take in the nitrogen from the air, and the bacteria turn it into nitrogen that can be used by the plant. There were lichens in the wetland as well, which are also nitrogen fixers and also represent a mutualism. The lichens are made up of algae and fungus. The algae provide photosynthesis for the fungus, while the fungus provides water and structure for the algae. The algae will also fix nitrogen from the air into a usable form for plants it may be growing on. The relationship between the many Cattails and the birds of the community also represented a mutualism, as the birds will use the Cattail fluff as nesting material and the Cattails will get seed dispersal.

The entire wetland was an example of competition! Every community was competing with each other for space, as demonstrated in the sharp ecotones. The more successful species had the most space, which I think might be the Reed Canary Grass. The Creeping Buttercup is another example of a more aggressive form of competition, in which the plants root actually put out an herbicide to kill other plants, thus preventing them from getting to the available resources.

There are also some Consumer-Resource interactions happening in the wetland as well. Deer graze on the vegetation, which is herbivory. Long Tailed Weasels make their home in the wetland and will eat just about any food source they can get their paws on, making them omnivorous. Bald Eagles and other birds of prey are carnivorous, perching in the trees on the edge of the wetland to scout for available food sources.

There was also a parasitic interaction. I learned that Salt Marsh Dodder doesn't photosynthesize on its own, so it sends its vine to wrap around the Spirea and sucks out the sugars on it in order to keep itself alive.

Habitat & Diversity

The habitat of the wetland is, well, wet. Each of the three H's of the wetland demonstrate that fact: Hydrology, Hydrophytic Plants, and Hydric Soils. Everything that lives there has to be able to deal with very wet conditions. Salmon like to use the area as a holding place both on their way up and down stream. There are lots of bugs and organisms that live in the water that they like to eat.

Topography plays a big part in the diversity of the wetland. Trees will fall over, and soil will be pushed around by water, creating pockets of standing water near areas of dryer land. These standing pools are great homes to things like salamanders, frogs, and water skimmers. The standing water also grows a good amount of Duckweed. This combined with lots of tall grasses makes an ideal nesting habitat for ducks and other waterfowl.

Beavers play an important part in the creation of habitats and diversity in the wetlands. When they build their dams, the flooding creates disturbances that destroy existing communities. This creates a new habitat area and invites greater biodiversity.

I really learned a lot about the process of the production of peat. In the wetland, the soil has very little oxygen in it because the water saturation pushes most of it out. Because there is so little oxygen, things don't decompose very well. The grasses and sedges will die and fall over, and new grasses will grow on top of the dead ones. This buildup of dead matter is what turns into peat! Peat is very high in nutrients that the wetland plants need to grow.

Resources & Adaptations

The things that live in the wetland have adapted to living in places with low oxygen. Rushes and sedges have a spongy tissue called Aerenchyma that runs down their length to their

roots to deliver oxygen from the air since they can't get it from the soil. Salamanders use this adaptation to their own advantage, attaching their eggs to Sedge stems to get some of that oxygen as well.

Other plants have adapted in order to disperse their seeds, such as Cottonwoods and Willows. Willow seeds form in catkins and are very similarly dispersed as the Cottonwoods are—in the air! Willows have another method of growing though. They can clonally reproduce from single branches that come into contact with the ground. This helps the willow establish a tight community in the wetland, especially if one falls over.

We were lucky(?) enough to see a Western Garter Snake while we were walking, and I learned that the terrible smell they produce is a defensive adaptation! Gross, but cool.

Human-Nature Interactions

Human interaction is evident in the wetland. Most noticeably there is a man-made boardwalk running throughout the area. The boardwalk is built with Styrofoam to help it float, but sometimes the Styrofoam breaks off, creating pollution. The presence of people can also be seen in bits of litter. Many of the plants directly along the boardwalk showed signs of recent mowing, as the park is maintained by the Snohomish County Parks Department.

Historically, the area was farmland. The daughter of the owners didn't want the land to be used for housing developments, so she sold it to the city as a storm water retention area. She was right... there are condos that have been built right next to the site. It is also very near a highway and the noise from passing traffic disturbs the wildlife. People also used to mine the peat in the wetland because it is a good source of fuel.

Humans introduced many of the invasive species that are causing problems for the native species. Canary Reed Grass was brought in for cattle to graze on, and now it covers a huge area of the wetland. Scotch Broom was brought in by the government, and it also tends to choke out other plants around it. Recently Touch-Me-Nots have also had a large growth spurt in the area, which are also an invasive species.