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Environmental Engineering Project

Physics B P.4

**Background:**

A climax community by definition is a stable mature community in a successive series which has reached equilibrium after having evolved through stages and adapted to its environment (“Climax”). When linking this definition to the affected burned area that we have been studying, you could say that the climax community more specifically pertained to the biological community of the burned area. Over the past couple months, we have been studying the biological progression of different plants, and animals and how they’re readapting to their environment; thus working towards reaching their “climax community”.

There are many invasive species within our local community that tend to make reaching a climax community quite difficult. Within my observations at my various sit spots, I had noticed quite an abundance of species of plants that were on their way to rendering the growth of many other plants by completely dominating a specific region. The most prominent of invasive species that I had observed was the Cytisus scoparius, or more commonly known as “Scotch Broom” (“Washington”). At one single sit spot I had recorded observing a count of approximately 20 scotch broom. Another invasive plant type that I had observed was the common weed. Unfortunately, I was unable to identify the exact name of these weeds. However with that being said, I had still gathered count of about 3 weeds in one sit spot.

Within the community there are loads of habitat restoration projects being sought out every day. The Pacific Northwest Salmon Center that’s located right in Belfair does so much to restore, maintain, and educate the community on the importance of preserving salmon. A major project that they have engineered is the Union River Estuary Restoration Project. The purpose of this project is to restore the estuary and tidal function to over 32 acres by breaching the existing dike in two locations, regrading to elevations similar to adjacent marsh conditions, and accommodating storm water drainage (“Union”). By restoring the estuary, the salmon center hopes to allow a more suitable environment to the inhabiting species of fish, including chum, salmon, coho, and cutthroat trout (“Union”).

**Problem:**

 During fall of last year, the forested area behind North Mason High School caught fire due to unknown causes. The enflamed area was referred to as a “brush fire” because it mainly engulfed areas of scotch broom. The fire began at approximately 1 p.m. on a Tuesday and became 70% contained by Wednesday evening (“North”). During this time, the fire affected about 10.4 acres of land behind the school (“North”).

 At this moment in time in order to reach climax community, there must be some changes set forth within the environment of the affected area. First off, the area needs to be cleared of all dead/burned plants or debris, as they are doing nothing to benefit the future growth of new plants. Another thing that must be done in hopes of restoration is to replant any damaged trees or plants that had been affected (“Forest”). Finally, although the affected area was in fact greatly inhabited by invasive species of plants, I still think that it would be most beneficial to possibly rid the area of any overly invasive species of plants in order for new plants to be allowed to grow and prosper.

**How data was collected:**

 Throughout this project, I have recorded data from three different spots within the affected area behind North Mason High School. My first sit spot was approximately 30 yards down the cross country trail and right off the path by about 1 yard. The next two spots were relatively close to that area, with the exception of traveling further off the path with every sit spot. The way I went about identifying the species was for the birds and wildlife I would mostly listen to the calls and chirps. From that, I would decide what animal I was hearing based on the sound. I would also identify animals by seeing them and identifying them that way as well. For identifying the plants, I again used my vast knowledge of field biology and ecology and used that as my guide for identification. For the plants that I didn’t recognize, I would take a picture and then research the name once we had gotten back to class.

 The type of program that we used to input and store all of our observations and data was called GIS. The main purpose for using this program was to be able to see where people had observed their data on the map, rather than just with coordinates. It was a more hands on approach to being able to see the data. It also allowed us to get an idea of what was living in other people’s sit spots, and how the vegetation was developing in other areas besides our own.

**Data analysis:**

 The habitat being studied most definitely varied. As shown with each different sit spot that had recorded data, there were some major differences. For instance, the majority of Hector as well as Colin’s sit spots merely had an abundance of birds and very little (if any) plants. This data suggests that the area around the sit spot had mostly trees; suggesting that the birds lived in them, hence the reason for seeing so many or that the area had absolutely no arrogation thus making it easy to spot birds ahead. In contrast to this data, there are clearly many different sub habitats within the entire area. An example of this can best be referred to me, Levi and Sarah’s data. Out of our data, we had more plant species recorded such as scotch broom, ferns, and grass. This suggests that the habitat surrounding our three sit spots is more suited for lower to the ground animals with having so many low to the ground plants for them to find shelter.

**Proposed solution:**

 In order to restore the affected burned area to its optimum potential, there must be some things done. First off, since the affected area was burnt, I feel that taking excessive precautions to ensure that such a thing doesn’t happen again is a must. Educating the community about fire prevention would be a good start in fixing this issue, however physical action is the most effective way to go about a solution (“Forest”). First off, we must clear the area of all burnt or dead plants. Next, we must also remove all invasive species from the area, for they hinder the growth of more prosperous plants. The focus of the removal of invasive species should be highly focused on scotch broom, because of their abundance, as well as their excessive flammability (“Broombusters”). Scotch broom also spreads quickly and is a total nuisance to the plant community within the area. After the area is cleaned up of all invasive species, we must replant the area in order to restore habitats as well as food sources for herbivores. Some types of plants that are non invasive, native, and beneficial to the areas wildlife are shrubs, berry plants, and different types of trees (“Top”). These plant types will not only benefit the area by allowing a food source to herbivores, but it will also allow shelter for birds, squirrels, etc. Furthermore, we must take into consideration how much things dry out during the summer time. Again, with the idea of preventing anymore fires, we must make sure that there is a plentiful amount of moisture to disallow any fire from springing up. Ways we can do so is by engineering a man made stream directly through the area. By doing this, the water from the stream could provide the essential moisture needed for fire prevention within the area, as well as doubling as a water source for the inhabiting animals.

**A wrap up paragraph:**

 This project was very beneficial in us learning about how wildlife and plants go about re-growth after something destroys their habitat (such as a fire). During the first part of the project, the class had placed soot trays in a designated area called a “sit spot”. At that sit spot, we had taken record of all living species of plants, critters, and animals within about a 1 meter radius of our soot tray. After taking detailed data, we would wait one week, then return back to our designated sit spots to observe the soot trays for any traces of animals crossing that area (i.e. with footprints, smudges, etc). Next we would find yet another sit spot, record our observations/findings, and so on. This cycle went on for approximately one month. After this month, we had imputed all of our data into the GIS program to help us get a good idea of what everyone else had been observing as well. Once we had a chance to step back and really see how the data had changed over the course of a month, we could conclude that different areas had been affected in various ways with the fire. We could also conclude from our data that the fire most definitely hindered the lives of many animals within the area by destroying their habitat. Once everything had been said and done as far as data went, we were to write a paper such as this one; and the rest is history.

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