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ENVS 3999

Final Report

Riparian Buffers with ECCD: Ledyard CT

Pfizer Field Project

OVERVIEW:

The project involved the installation of vegetated buffers along streams and coastal riparian corridors using native plants to provide flood control, filter or trap pollutants and provide food and shelter for critical pollinator species. We worked with ECCD in their goal to create and map of one connected pollinator pathway on town, residential, business, and open space properties along the Tri-town multi-use recreational trail (City and Town of Groton, Ledyard, and Preston) and a second pathway from the City of Groton to the Town of Stonington. We focused our efforts in the town of Ledyard near the Tri-Town Trail. Our goal was to locate a site which was a good fit for the addition of a riparian buffer. We were also tasked with creating a plan which can be implemented at the site using information from the TN planning guide and our own independent research. Two sites were compared, but in the end, we decided on the Pfizer Field site off of Stoddards Wharf Road.

SITE SELECTION:

The majority of this project involved the use of various aerial imagery sites to locate and identify sites that looked like they would benefit from the addition of a riparian buffer. There was

a beginning learning period where we figured out how to use the software as it was new to both of us, but once we figured it out, we were able to actually get started. We spent a long time searching along the Tri-Town Trail and identified a handful of sites along the Morgan Pond Reservoir. We were unfortunately unable to use these sites due to the ownership from Groton Utilities Company and the development regulations put in place due to the reservoir being a public water supply. However, all of these sites we did identify would have all been great spots to create a new riparian buffer.

After our initial unsuccessful attempts at locating a site, we had the Pfizer Field site suggested to us along with one site near Joe Clark Brook. We conducted site visits for both of these sites and were able to fill out the Site Assessments from the TN Riparian Buffer Guide.

PFIZER FIELD SITE:

This was the site we settled on for our final plans and implementation it is located at 212G Stoddards Wharf Road. The actual plant selection was done by Jack while I handled creating the graphics for the site as well as looking into the ecosystem benefits and future plans for the site. This site was mostly overrun by invasives, specifically Multiflora Rose and Honeysuckle. There were hardly any native plants present besides a few scattered Red Maple trees. The majority of the site was dominated by grass and some mosses that were very low to the ground with the grass being consistently mowed/maintained. We decided on an area of approximately 1000 square feet which we then created a plan for what plants to be added and a

general idea of where they should be added. Below are some images of the site we took during our site visit.



The right image highlights the view of the bank with the lack of plants and no actual buffer present. In the bottom of that image, you can see a small patch of the invasives that take over the majority of the bank. The left image shows some evidence of erosion of the bank, there is a very steep drop off along most of it and there are some exposed roots that you can see poking through where the dirt has been washed away.



This image shows the large presence of invasives along the entirety of the bank of the brook. It also highlights the lack of diversity with grass being the dominant plant here.

We selected this site over the other one since it scored only a 1 on the TN Site Assessment. This site was also more easily accessible for actually getting plants, volunteers, and possible trucks/equipment to the site. The TN Site Assessments will be included at the end of this report.

JOE CLARK BROOK:

This site could also be a good potential option for a riparian buffer addition. However, due to the presence of many rocks and the site itself being harder to access we decided to focus on the other site instead. This site could benefit from some targeted addition of native plants that could provide structure for the bank as well as support in the pollinator pathway. There was clear

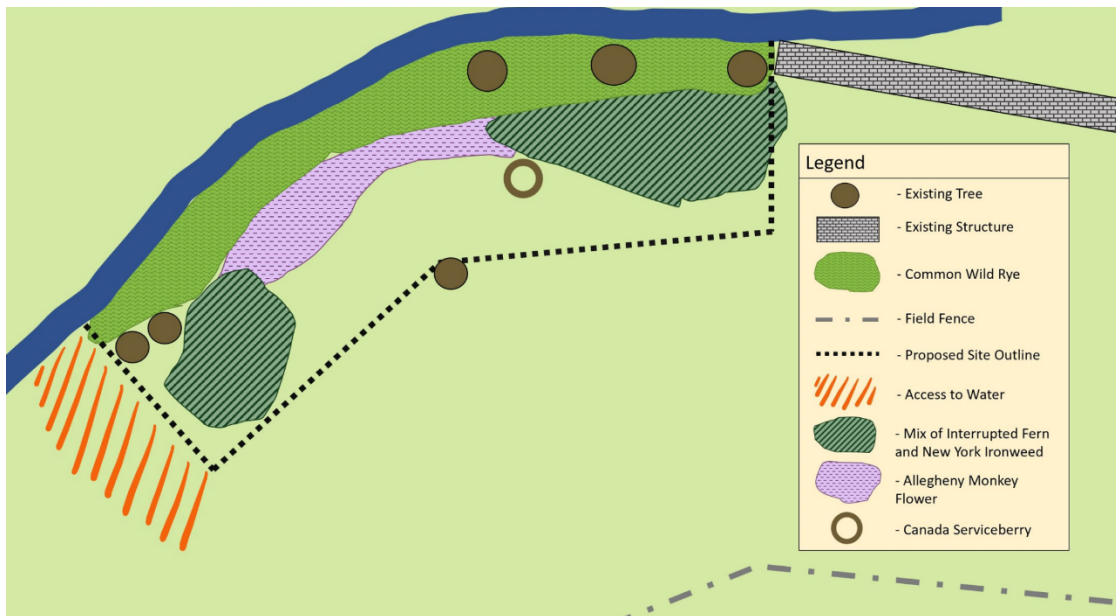
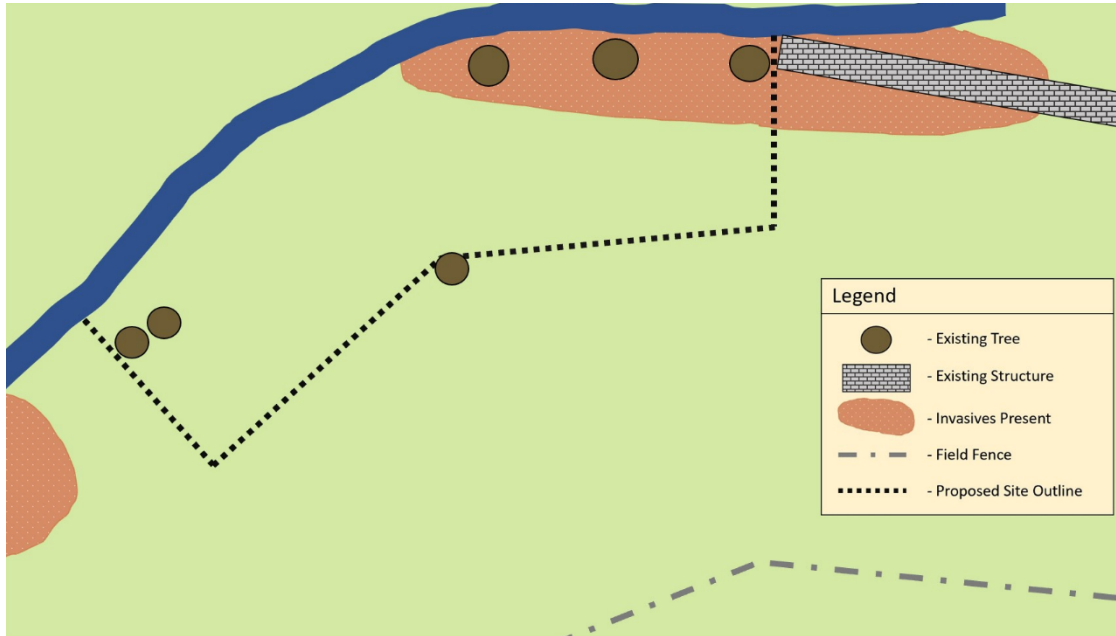
evidence of erosion of the banks near this site with one tree having many exposed roots and looking like it may fall into the water (image included below). There were some invasive species present, but not to the same extent as seen in the Pfizer Field site. There were also more native species already present, and the site seemed to be in better shape. There still wasn't an actual buffer but it did not need as many plants added and wouldn't require extensive work to be done prior to any additions being made.



The image on the left shows the majority of the site, you can see more variety in the plants that are present and less extensive invasive species cover. The image on the right shows the erosion near the tree at the center of the picture. The roots are mostly exposed and you can clearly see the lack of stability of the bank. Both images also show the large number of rocks that are scattered both near the bank and throughout the site.

SITE PLANS:

Jack focused on the actual plant selection, but I wanted to include the graphics that I created here. The first graphic shows the site before our suggested changes while the second shows the changes that we wanted to make.



Before any planting can be done the invasive species would need to be removed and the garbage found around the site would need to be cleaned up. Once that was done the land would need to be tilled in order to prepare it for planting. The layout of the plants can be seen in the graphics above. We also wanted to keep an area where the water could still be accessed since the site is near a baseball field and sometimes balls are knocked into the water. The access allows them to still be able to retrieve any lost balls. It also allows for any recreational use of the brook to still be done, as the path that led to the water looked well worn down and frequently used.

The plants that we selected consisted of many pollinator friendly plant species along with some grasses that would be planted right along the bank to help with stability. We also included one fern species in order to have some green foliage that would be long lasting to help the aesthetic value of the site. The flowering plants would also help this aesthetic value which was important to us for this site since it was in such a public space. We wanted people to be interested in this new addition and possibly help get more riparian buffers added elsewhere after seeing what it could do here.

ECOSYSTEM SERVICES/BENEFITS:

The addition of a buffer in this site would provide many ecosystem benefits. This riparian buffer would be able to limit the amount of runoff ending up in the Bilings Avery Brook. This helps reduce the amount of water going into the water system and any other bodies of water it may connect to. One major concern with the site was the use of fertilizers on the baseball field itself. During our site visit the grass was quite green, which indicated that there were likely fertilizers used to make it look appealing for the public. The addition of the buffer would prevent these fertilizers from ending up in the water through runoff. Due to this we also didn't want to include any fertilizer use in the planning and establishment stages for the plants we add. We

didn't want to be responsible for adding any more fertilizers to the water and hoped that the runoff of fertilizers from the baseball field might help our plants grow. Reducing soil erosion was another major component of this project. There was a lot of evidence of erosion along the bank of the brook, so we selected plants that could hold in the soil and prevent any further erosion and soil loss. Along with decreasing runoff and soil erosion we also wanted to help increase the biodiversity at the site. There was little variety in plants at the site with only grass, invasives, and a few trees present. By removing the invasive species and adding more native plants we are able to greatly increase biodiversity here and support local species in the process. The plants were selected to act as a piece in the pollinator pathway and would attract a number of important pollinators. The riparian buffer would also help with any possible flooding seen during heavy rain events. One final benefit seen would be increasing the aesthetic value of the site. This could make people more interested in riparian buffers and boost community involvement in projects like our own. This could lead to the addition of more riparian buffers, patches in the pollinator pathway, and even just increase knowledge about what riparian buffers are and what they can do.

FUTURE PLANS:

In the future, continued monitoring will likely be necessary, especially during the beginning stages as the plants establish. Those first few months while the plants are just getting established are the most important for the success of the buffer. The plants would likely require regular watering, depending on weather conditions, so they do not dry out and die. The site is in a very public space where children, dogs, people, and maintenance equipment like lawn mowers could easily access the site and newly added plants. Due to this, it could benefit from a fence being added temporarily surrounding the site to prevent any accidental damage to the young plants. There would also definitely need to be continued monitoring of the level of invasive

species at the site. We don't want them to take over again meaning continue removal might be necessary.

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