



Overview

In 2007 the Anacostia Watershed Society (AWS) initiated an experimental research project with the help of an interdisciplinary team of experts to look for alternative methods to riparian buffer restoration where reforestation is not permitted because of stream channel engineering constraints. AWS has been working at a short section of the Northwest Branch of the Anacostia River, immediately downstream of the 38th Avenue Bridge in Hyattsville, Maryland, in the Washington Metropolitan Area. In the 1950's the U.S. Army Corps of Engineers constructed levees that reach from the bridge down to the confluence of the Anacostia River with the Potomac River. The levees were designed to protect surrounding communities such as Hyattsville from a 100-year storm. As a consequence of levee construction, much of the natural river conditions were severely disturbed and the banks were reinforced with large, angular blocks of gray granite (known as "riprap"^(?)). AWS conducted an experimental habitat restoration project, called the 38th St. Bridge Project, on the rip-rap slope along the streambanks in order to demonstrate an alternative to the county's annual mowing-and-spraying of herbicide. Mowing-and-spraying kills all the native plant species and leaves suitable habitat for non-native invasive plant species, which rapidly encroach upon these streambanks. The purpose of the project was to monitor the impact of three vegetation management regimens on plant species and how the proposed method of native herbaceous plant species would be an alternative to the mowing-and-spraying without increasing the channel roughness and thus the likelihood of a flood that could endangered the communities downriver. Our results and observations show that the plot cultivated with native herbaceous plant species and subjected to invasive plant control (planted plot) support more native plant species diversity (78 plant species; 43 native species and 35 non-native species) and wildlife than those that are subject to the mowing-and-spraying method (39 plant species; 12 native species and 27 non-native species). Planting native forbs and controlling the most invasive alien species could be a promising vegetation management that can be used by the public agencies to achieve a better management of urban green spaces. This could be done without meaningfully changing the hydraulic smoothness of the channel, and would return aesthetics for the benefit of the park users and improve the urban wildlife habitat.

Project Details



Lead entity types:

- NGO / Nonprofit Organization

Partner Organizations:

Anacostia Watershed Society

Adaptive management

Describe adaptive management processes and mid-course corrections taken to address unforeseen challenges and improve outcomes in each of the following categories:

Other:

1. The Blond Death method of managing the riverbanks nearly eliminates native plant populations and many of the pollinators and wildlife supported by native plant populations. 2. The Blond Death method of managing the riverbanks leaves the river an unsightly centerpiece in a busy park and neighborhood. 3. Summer mowing of the shoulder meadows promotes the growth of tall fescue and will destroy any chrysalises present. Summer mowing allows cool season grasses to flower and set seed before the mowing cycle is complete, while interrupting the reproductive cycle of most native sunny meadow plants. If the support of native plants, pollinators, and bird life becomes an objective of the riverbank management regimen, alternative mowing regimens should be tried. 4. A management regimen that targets the most aggressive alien plants should be considered as an alternative to the Blond Death approach. Results of this approach should be similar to those found in our Planted Plot. This could be done without significantly changing the hydraulic smoothness of the channel, and would return aesthetics and local character to the site. The park would offer far more rewarding butterfly and bird watching opportunities than currently available to visitors. 5. Native plugs should be planted in the fall to prevent exactly what happened in this study: a spring planting followed by a persistent drought. In the event that funds cannot be arranged in time for a fall planting to be organized, a one-year, no-cost extension of a grant is preferable to a spring planting. 6. As long as the Blond Death management plan continues, vines that survive the glyphosphate broadcast should be spot-killed to prevent the evolution of herbicide-resistant plants.

State of Progress:

- Implementation

Project Start:

2007-01-04

Project End:

2007-01-04

Global Regions:

- Americas
- Northern America
- World

Countries:

- United States of America

Ecosystem Functional Groups / Biomes:

- Temperate-boreal forests and woodlands biome

Extent of project:

- Other

Extent of restoration:

- Other

Degradations:

- Deforestation
- Invasive species
- Urbanization, Transportation & Industry

Description:

The project is located in the middle of a suburban area on the outskirts of Washington, DC; the area has been subject to urban development to some extent since colonial times. It is a highly fragmented landscape with some remnant woodland habitat and other greenspaces along house yards, riparian buffers and adjacent small patches of protected parkland. In the 1950's the U.S. Army Corps of Engineers constructed levees that reach from the 38th Avenue bridge down to the confluence of the Anacostia River with the Potomac River. Before the construction of the levees the area was deforested.

Planning and Review**Goals and Objectives****Was a baseline assessment conducted:**

unsure

Was a reference model used:

RM5

were_goals_identified:

YES

Goals and objectives:

- Other

Goals Description::

The objectives of the research project were set by the Anacostia Watershed Society with the aid of experts in the fields of edaphology, hydrology, botany, ornithology, and entomology. Channel infrastructure maintenance practices required by the Army Corps of Engineers and the Department of Public Works were important criteria for establishing the project goals. The idea of the project was to introduce a better model of vegetation management that would benefit native biota without jeopardizing the purpose of the infrastructure built along the river. Thus, the project's primary goals included: 1. To introduce soft-stemmed, native, herbaceous vegetation to the site and see if it had the effect of reducing channel roughness (the vegetation should lie flat during a flood, softening the impact of the angular riprap on flowing water) thus improving channel conductivity, 2. To monitor the impact of three vegetation management regimens on plant community composition, 3. To determine if the different management regimens would impact the soils at the site (for example accretion or erosion), and 4. To determine if changes in plant community composition resulted in an increased use by native pollinators and native birds. Having concluded the research phase of the project, AWS seeks to implement a habitat restoration project that puts into practice all the lessons learned from the research phase. The new

implementation phase will focus initially on a 1.14-mile segment of the NW Branch of the Anacostia River from the 38th Avenue Bridge to the Rhode Island Avenue Bridge. Eventually, the effort will expand downriver and up the NE Branch of the Anacostia River. The new objectives set for the implementation phase are the following: 1. Remove 100% of the woody plants growing on the streambanks in all the areas that are currently subjected to the mowing-and-spraying vegetation management regime. This applies for all the plants containing woody tissues regardless if there are either native or non-native; this includes shrubs, vines, woody herbaceous plants (not true woody plants), and trees. This is a channel maintenance requirement set by the Army Corps of Engineers. 2. Stop the extensive use of herbicide to control the vegetation along the streambanks; and gradually reduce it through the use of a targeted herbicide application regime until an herbaceous plant community with a dominant cover of native species establishes successfully at the restored sites. 3. Replace the mowing-and-spraying vegetation management regime used along the streambanks with an open-land habitat restoration management approach that encourages the establishment of a diverse herbaceous native plant vegetation cover that supports more wildlife. 4. Reduce the populations of non-native highly invasive plant species at the restored sites to increase the area of habitat available for native plant species.

Stakeholder Engagement



Were Stakeholders engaged?:

unsure

Description of Stakeholder Involvement:

The infrastructure built by the Army Corps of Engineers had the purpose of protecting local communities from a 100-year storm. Ever since, the Army Corps of Engineers and the Department of Public Works have been providing maintenance to the streambank, mostly avoiding the establishment of woody vegetation that would increase the channel roughness. The Anacostia Watershed Society has been working for the last 20 years to clean and restore the river watershed. It was this organization that identified the need to use an alternative vegetation management method that would increase native species diversity without jeopardizing the main purpose of the infrastructure built by the government agencies (which have recently agreed to implement the method proposed by AWS). AWS uses volunteer work to achieve its environmental mandate of recovering the shores.

Ecosystem Activities and Approaches



General Activities: During the research and planning phase of the project, in which the project is currently situated, the proposed vegetation management regime has been analyzed and documented and the management practices determined. The overall goal was to satisfy the Army Corps of Engineers' objectives of high channel conductivity through introducing soft-stemmed native plants to the riprap bank and shoulder meadow areas. In turn, these native plants would support native pollinator and bird communities. A drought during the growing season of 2007 partially affected the research results since it impacted both the planted natives and the naturally occurring plant species. Flowering was greatly reduced for most plants, and this in turn reduced the attraction of all the plots to pollinators, and reduced seed set to attract birds (Tangren 2007). A list of all species observed within each plot was compiled during the period from 2007 to 2009. Most species were keyed using The Herbaceous Plants of Maryland (Brown and Brown, 1984). This taxonomic information was updated with a visit to the PLANTS database (<http://plants.usda.gov>). Additionally, a digital herbarium containing the common species was assembled and has been distributed to team members and printed in the study report. Three plots were marked for application of the following vegetation management approaches according to Tangren (2007): 1. Blond Death Plot: First of all, what in the world is "blonde death"? Dr. Sara Tangren used the term "blonde death" as a reference to the vegetation management method of mowing and spraying with herbicide. The unofficial term comes after the fact that the vegetation sprayed with herbicide turns into a light brown-yellow color which indicates the lethal fate of the plants. In this plot, the impact of the existing management regimen of semi-annual glyphosphate broadcasts and annual mowing of the shoulder meadows was sampled. For 2007 the shoulder meadow within the plot was not mowed so that plants would be able to grow, flower, and set seed to facilitate species identification. In most years, the riprap bank was sprayed twice (spring and late summer); in 2007, there was only one spraying date, June 26. This decision to omit the late season spraying may have been due to the drought; most vegetation does not respond to herbicide during a drought. 2. Control Plot - This plot was simply cordoned off and nothing was done to manage it. The only exception was that any saplings observed were killed, as tree growth is not permitted on the riprap banks for flood control reasons. 3. Planted Plot - This plot was similar to the Control Plot in that the regular spraying and mowing program was put off. However, here we selected certain invasive species to manage. Specific aspects of the invasive plant management regimen are to be provided in a separate report. Furthermore, in March 2007, 9,080 individual plants of 27 locally native species were planted on the riprap bank and in the shoulder meadow. Species with soft stems likely to lie down in a flood and reduce hydraulic roughness, and with habitat value likely to support birds or pollinators, were chosen. All plants were of local origin, many propagated from seed collected further upstream in the watershed of the Northwest Branch of the Anacostia River. The vegetation in the plots was measured quantitatively at the end of the growing season using the point-intercept method. Patch data was analyzed separately. The results and observations show that the plot cultivated with native herbaceous species along the rip-rap slopes of the river (planted plot) support more native plant species diversity (78 plant species; 43 native species and 35 non-native species) and wildlife than those that are subject to the mowing-and-spraying method (39 plant species; 27 alien species and 12 native species). Observations from the project specialists have totaled 31 natives and 20 non-native species at the same plot throughout the growing season of 2009. The study and further observations also show that the blond death and control plot sites are havens for invasive plant species. On the blond death plot, 25 species were non-native and only 12 were native. This shows that the streambanks currently subjected to mowing-and-spraying with herbicides are

areas of little diversity, lots of bare ground, and a prevalence of aliens (Tangren 2007). The project seeks to replace the mowing-and-spraying vegetation management regime used along the streambanks with an open-land habitat restoration management approach that encourages the establishment of a diverse herbaceous native plant community that supports more wildlife. The management practices to be used in the implementation stage are as follows: - Site preparation and seed sowing: This will be done by means of mechanical and chemical methods to control the existing vegetation (mostly non-native species) and prepare the soils for subsequent seed sowing. Seeds of native herbaceous plants of open-land habitat will be purchased from a commercial native seed retailer and sowed throughout the project site. - Woody plant management: This is a requirement of the Army Corps of Engineers for flood control reasons. This consideration applies to both native and non-native woody plants. The plants will be removed using the cut-stump method. - Non-native Invasive Plant Removal: The most invasive non-native plant species will be removed using manual, mechanical, biological and chemical control methods. With respect to the biological control methods, it is important to remark that a batch of 500 weevils (*Rhyncomimus latipes*) was released in a site adjacent to the streambanks to control mile-a-minute (*Persicaria perfoliata*). It is expected that the beetle population will increase and expand to the streambanks considering that there is a population of Mile-a-minute established at the sites. - "Meadow mowing": This method will be used to control undesirable vegetation without using herbicides and without having to damage the sowed native plants. It will be applied when the vegetation reaches 18 inches in height; the plants will be mowed no less than 8 inches with weed eater once a year. This will favor the sown, open-land-habitat native herbaceous plants to outcompete the non-native plants. Most of the field work has been done by AWS volunteers supervised by the staff and the specialists that have contributed to the effort. AWS integrates a field work experience with environmental education that brings public awareness to the invasive plant problem, water quality in the Anacostia River watershed, ecological restoration and other subjects. AWS is currently fundraising to implement this project and put into practice the education programs during the research phase.

Project Outcomes



Eliminate existing threats to the ecosystem: The Planted Plot has nearly twice the plant species diversity (species richness) of the Control Plot. This is mostly due to the larger number of native species observed within the plot. The Planted Plot was observed to contain 23 naturally occurring native species, half again as many as the Control Plot. It is reasonable to credit greater presence of naturally occurring native species to the management of invasive species, which frees up space and other resources that native plants can use. The diversity advantage of the Planted Plot was enhanced by the survival of 20 of the planted native species. Both individual native plants (35%) and patches of native plants (55%) thrived in the Planted Plot in comparison to the others. The difference is not due to the native plants that were added in March, as only 2 of those were intercepted, and none had made patches. The difference is entirely due to the control of invasive species. Factors limiting recovery of the ecosystem: The project is not trying to recover the ecosystem to its historic situation or trajectory; it is trying to establish an alternative plant community in an area where a normal ecological restoration approach is not possible. An overall problem facing this project is the persistence of invasive plant species that come from upriver or whose seedbanks were already established before the project started. Even though there is dominance by the native species as a result of the restoration efforts, invasive species pose an operative burden and cost. Economic vitality and local livelihoods: The bulk of the benefits provided by this project fall within the cultural services dimension. The improvement of the urban landscape along a city nature trail, the Anacostia Tributary Trail System, is an important recreation service provided by the project. With the implementation phase of the project, we hope to improve the overall ecological conditions of the trail by providing another important habitat and improving the urban wildlife watching experiences for parkland users.

Monitoring and Data Sharing



Does the project have a defined monitoring plan?:

NO

Open Access URL:

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Long Term Management



STAPER

