The Ohio State University
Campus as a Living Laboratory

Invasive Bush Honeysuckle Removal Coalition Proposal

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Table of Contents

Executive Summary

Invasive Bush Honeysuckle has become detrimental to the ecosystems of Ohio. As it has become increasingly problematic, different environmental organizations have taken steps to eliminate this harmful species. Honeysuckle negatively affects native animals, chokes out native plant species, and removes valuable nutrients from the soil. So far, there has been no organized plan in the Columbus area to join these forces to effectively and efficiently remove the honeysuckle. Therefore, our plan is to merge these environmental groups' efforts into one removal coalition. We believe it is the most efficient method to restore the affected ecosystems to their natural state, and to ensure the well-being of the native species in the area.

Our research has led us to propose a coalition between local environmental organizations in Columbus. This way, honeysuckle will be controlled in a more organized and efficient manner. We begin by providing background information on Bush Honeysuckle, its effects on native species, and the reasons why this invasive plant is so destructive. Next, we discuss our plan to merge the efforts of the organizations that have been working to remove honeysuckle, and to form a foundation of student volunteers. Finally, we list the potential methods available to remove honeysuckle in the least harmful and most efficient manner.

In summary, we hope to communicate to the general public the importance of the removal of nonnative honeysuckle from Ohio ecosystems. With a cohesive plan that links together organizations that have already performed successful operations, and willing student volunteers, we believe we can create a lasting partnership that will keep Bush Honeysuckle under control.

Introduction

Since it was first introduced to North America in the mid 1800's, Bush Honeysuckle has spread to become a very recognizable invasive species. Its presence has caused numerous problems for native species within their natural habitats (Rich, 2000). Our report aims to find the most effective plan of action for removing the honeysuckle in Columbus, Ohio by taking into account social, economic, and environmental constraints. By combining small local environmental organizations into a larger group, we plan to create a honeysuckle removal coalition with the hope that it will increase efficiency, reduce cost, and cover a larger area. First, we develop a plan to identify a workforce, consisting of students and other volunteers in collaboration with local environmental organizations. Then, we contact the respective groups to explain our methods and our plan to join them together. Finally, we create a list of the most feasible and efficient methods for removing the shrubs. Our proposed plan will provide benefits for both students and organizations by immersing students in the field for a hands-on learning experience, while contributing to each organization's goal of controlling this invasive plant and improving local ecosystems.

Background Information

Bush Honeysuckle is an upright deciduous shrub with a shallow root system and long arching branches. It commonly ranges between six to sixteen feet in height and has simple, opposite leaves. The three species of bush honeysuckle found in the United States are Tatarian (*Lonicera tatarica*), Amur (*L. maackii*), and Morrow (*L. morrowii*) honeysuckle. Amur honeysuckle was first introduced into the United States from Asia as an ornamental plant and for erosion control (Rathfon & Ruble, 2005). It was first planted in Ohio in 1960 in Oxford (Hoessel, 2010). Today, it is officially considered invasive in 27 states (Smith & Smith, 2010). Amur honeysuckle is the most problematic in Southwestern Ohio, while Morrow honeysuckle is problematic in northern Ohio, and Tatarian honeysuckle is problematic throughout the state. Nonnative honeysuckle can be differentiated from native species by their greyish-brown stems, which become

hollow as they age, and their round berries in clusters of two to fifteen, which are produced from midsummer through early fall (Smith & Smith, 2010).

Nonnative bush honeysuckle is detrimental to both flora and fauna in North American ecosystems because of its enormous impact on native plant species. With its ability to grow faster and mature more quickly than indigenous flora, as well as the length of time that its seeds can lie dormant and remain viable, it quickly outcompetes native vegetation (wildflowers, for example) for sunlight and other resources (Swab & Mitsch, 2003). It is also a very hardy plant, capable of thriving in full sunlight and moderate shade. Furthermore, it reproduces through both sprouting and seeds, which are quickly spread by animals such as birds and deer. These characteristics have allowed it to invade a variety of sites, including abandoned fields, roadsides, woodland edges, and open woodland interiors (Smith & Smith, 2010). Some species of bush honeysuckle are allelopathic, which means they leach toxic chemicals into the soil that can prevent seeds of other species from germinating (Invasive Species Overview, 2005). There are additional mal-effects when dense thickets of honeysuckle are removed. After removal, soil is left bare and particularly vulnerable to erosion (Invasive Species Overview, 2005).

As well as negatively affecting native plants, honeysuckle is detrimental to native wildlife. One example of this is a reduction in tall cover, which increases predation on native animals that seek protection from more bushy native plants. Bird eggs also experience more predation, as nests are more visible in honeysuckle than in native shrubs (Invasive Species Overview, 2005). Native animals suffer from a reduction in the variety of food that is available as well. Not only does honeysuckle reduce the amount of adequate food for animals by outcompeting native plants, it provides animals less nutritious berries as a food source. These berries lack the fats and nutrients that native plants provide. Migratory birds are especially affected by this, as they need those fats and nutrients for their long flights (Smith & Smith, 2010). Birds can also be harmed indirectly by the effects of nonnative plants on insects; the number and diversity of plant-eating insects drops drastically when foreign plants invade an ecosystem (Carey, 2007). All of this adds up to take a dramatic toll on indigenous wildlife. To decide how to best combat these issues, we spoke to professionals from our area.

Organizations Involved

We asked a few different organizations to be a part of a bush honeysuckle removal coalition, such as FLOW (Friends of the Lower Olentangy Watershed), Columbus Recreation and Parks, the Columbus Audubon Society, the Grange Insurance Group Audubon Centre, Franklin Soil and Water Conservation District, and student volunteers at The Ohio State University. The groups will work together in the sharing of information on the location and infestation level of bush honeysuckle in certain areas within the parks in the Columbus area, and collaborate on setting appointments to band together and most effectively manage the honeysuckle population. With shared data and a more concentrated effort in removal, bush honeysuckle will be more effectively managed, and will thus be on the path to eradication. Being in contact with these organizations and joining our ideas with their extensive knowledge of invasive species removal led to the idea of the coalition.

The Columbus Recreation and Parks Department is the group that has done the most documented removal of Bush Honeysuckle, with 29.07 acres cleared so far (Hoessel, 2012). The people of Recreation and Parks will focus on organizing the coalition as a whole and setting up dates for removal events. Having one body set dates creates a more organized structure, as opposed to having each group set their own dates for removal and asking members from the coalition to come when they can. With this narrow focus, more impact will be seen in the selected areas, and bush honeysuckle can be removed in these locations. This organization has a program called Keeping Columbus Beautiful. When we asked for our coalition to be involved in this program, we found that the program is mainly meant for tasks such as litter clean up. The creator of Keeping Columbus Beautiful offered to tweak the program in order to incorporate invasive species removal to the itinerary. If the coalition were involved in this program, we would have areas designated with signs with our group's name. Columbus Recreation and Parks would provide machinery such as wood-chippers and chainsaws. They would also provide a truck to use for hauling away the cut-down honeysuckle. Additionally, they would hire a park-aid who would be available for

continued maintenance of the area. This person would have the certification required to operate the necessary machinery.

Friends of the Lower Olentangy Watershed (FLOW) is a volunteer organization that works to improve the quality of the environment in the Greater Olentangy Watershed area. From planting trees in residential areas to removing bush honeysuckle in areas such as the OSU wetlands, their focus is on plant life in the area. One purpose that FLOW serves in the project plan is to provide a strong volunteer base and a recognizable name to go along with the face of the project. An important aspect of the group's involvement is to supply skilled volunteers to the affected areas; those certified to use chainsaws and herbicides. Without these individuals, the effectiveness of the volunteer workforce is severely restricted, as we would just be throwing unskilled labor at the problem and hoping numbers alone can solve it. Utilizing FLOW is helpful for our coalition because it adds the expertise of many skilled and experienced volunteers, as well as a vehicle for spreading the word that this group exists, seeing as how FLOW already has many members.

We asked the Grange Insurance Group Audubon Centre to provide mapping data obtained through aerial photography, and establish a baseline from these data with Franklin Soil and Water Conservation District. This data would make it much easier to address the worst affected areas instead of sporadically hosting removals in locations chosen based on partial data. We hope to access these records and incorporate the Grange Audubon Centre into our coalition.

Working as another decision-making body, Franklin Soil and Water Conservation District will choose the best areas to hold the removal events. Using GIS and other planning and mapping tools, an effective plan of action can be drafted. Utilizing this organization adds efficiency in carrying out each step of the plan, and reduces costs for each separate organization. With a well-defined itinerary and central management considering environmental impacts, the coalition will take a more concrete form and become respectable, helping to create a good public image and attract volunteers.

Having Ohio State students involved in the coalition makes it more appealing to potential financial donors and volunteers. The students that sign up to volunteer

contribute to the service message of the university, “pay it forward.” People in Columbus see the university in a positive light, and involvement in the coalition will only improve that.

The data that the coalition will acquire in the removal efforts will also be made available to the Ohio State Wetlands Research Facility and the Maymester class on invasive species. The methods used by the coalition can then be put into practice on university soil, and anything from research projects to classes can be involved with the management of Bush Honeysuckle.

Plan of Action

There have been efforts to remove honeysuckle from the Columbus area, including the Ohio State University wetlands and hardwood corridor by the organizations mentioned previously. As stated earlier, different organizations such as FLOW, the Columbus Recreation and Parks Department’s Ecological Restoration Program, and Franklin Soil and Water Conservation District have all worked to get out in the affected areas and remove this invasive plant. The aim of our group is to join efforts and form a coalition between these institutions. This would lead to making more headway with honeysuckle removal. If these groups have independently removed many acres of honeysuckle, then together, they can surely make an even bigger impact. Instead of groups removing honeysuckle in areas unknown to other groups, their plans should be synchronized and locations should be picked based on where other work has been done in the past. The creation of this coalition would provide the means for honeysuckle to be removed in the most efficient way possible.

Another component of our plan is to create a volunteer group base. We speculate that this group will consist mostly of students. One way we plan to do this is to distribute an informational flyer around campus. This flyer will inform students about the effects of honeysuckle on the ecosystem, as well as provide them with the opportunity to be a part of the removal efforts. It will give information about how to join with our group and who to contact. We also plan to ask professors in the School of Environment and Natural Resources to email this flyer to the students in their classes. A third way

that we plan to acquire volunteers is through the use of social networking. We will create Facebook and Twitter pages in order to spread the word that our group exists and recruit interested people who care about our area's ecosystems. As well as working with student volunteers, we are utilizing the expertise of our area's wildlife professionals. Within the volunteer group base, we will elect officials who will do jobs such as recording information on Google Documents, organizing recruits, creating flyers, and any organizational tasks that need to be accomplished.

We have been connecting and working with FLOW, Columbus Recreation and Parks, and Franklin Soil and Water Conservation District. To give our group a solid beginning, we plan to use the Columbus Recreation and Parks "Keep Columbus Beautiful" program. In this situation, we will be working to remove invasive honeysuckle in a public park. The Keep Columbus Beautiful program is designed not for invasive species, but for tasks such as trash clean-up. We have been working with professionals who plan to create a branch of this program to cater to our idea of a coalition. This branch would be geared toward invasive species removal.

Once we have established our coalition and removed honeysuckle from a public park, we will move to other areas. To find where we should work next, we will utilize any available data from the involved organizations that shows where the infestations are worst. These will be our main areas of focus, and we will work alongside these groups during removal trips. It is common for groups to remove bush honeysuckle that is convenient to remove (along pathways, for example). This plan will lay out where we really need honeysuckle removed, and give everyone involved an idea of what areas should be focused on, even if these areas are less accessible than working at a place such as a park. The independent groups involved in the coalition will still have their independent honeysuckle removal events. In order to make sure that all groups know what areas have been worked on, we will use an online sharable documents medium such as Google Documents. Anyone included in the document share will be able to log on and see where honeysuckle has been removed, as well as any notes about the current status of specific removal sites before and after removal efforts. Coalition members will also make notes describing things such as what we could improve upon at

the next removal in order to optimize our efficiency, and what tools or materials would be beneficial to bring along next time.

Another potentially beneficial aspect of our plan is the addition of volunteers coming from an Ohio State Maymester class. This past year, Ohio State offered a Maymester class titled Invasive Plant Species Management. This two credit-hour course regarding invasive plants was designed to teach students about the restoration of the Olentangy River corridor, using the area as a living laboratory. It gave students hands-on experience with removing invasive plants. The objectives of this course included identifying invasive species, understanding their growth and reproduction, predicting the impacts they have on ecosystems, and understanding how to restore invaded areas. Honeysuckle was the main invasive plant focused on by this class focused (College of Food, Agricultural, and Environmental Services, 2012). If the course is adequately funded and an appropriate teacher is found, it will be taught in May of 2014. Upon learning about this course, our group saw an opportunity for another party that could contribute to the removal of honeysuckle. Assuming that this course is taught next May term, we want our volunteer base to work alongside it. When fieldwork to remove honeysuckle is being performed by students involved in the class, our volunteer group can work together with them.

Partnering with a university course would contribute additional credibility to our group, as well as give the volunteers the opportunity to record volunteer hours through the university. We believe that students may be more willing to sign up for this course with the added incentive of gaining volunteer hours. If this is found appropriate by instructors of the course, the students enrolled would be gaining university credit as well as volunteer hours. If instructors of this course gave students the option to participate in our coalition's honeysuckle removal sessions for volunteer hours, the course could advertise the volunteer opportunity that it offers with hopes of increasing the number of students who sign up to take it. Another benefit of using these students as volunteers is that they would be knowledgeable on the subject of invasive plants.

As creators of this potential coalition to remove an invasive species, we firmly believe that this plan is what needs to happen in order to make more headway. A main reason that we want to start this group is because when we were doing our initial

research to find which areas of Columbus had been treated for honeysuckle, we found that records of what work has been done are hard to come by. We saw this as an opportunity to create a forum to tie all of the discussed groups together in order to share information and resources. The coalition will use an online sharable documents program such as Google Documents in order to ensure clarity across the board. Before every removal event, the head of that specific event will create an itinerary and share it with the entire coalition. They will provide information as to where and when volunteers should meet up as well as what materials to bring. After every removal event, the success of the event will be documented. This will include which areas were worked on, how many volunteers were present, and if there is a need to go back to finish work in the specific area or not. Utilizing an online document sharing program is one way our coalition is more efficient than individual groups doing honeysuckle removal work. This will prevent differing groups from going over the same areas looking for honeysuckle that may have already been removed, as well as clearly showing the next direction the group will go.

Methods of Removal

Our coalition will need to use the best method we can find to remove honeysuckle. Two possible methods to do so are mechanical removal and chemical removal. While most methods fall into these two categories, there are also methods that combine both mechanical and chemical removal. These methods all have their advantages and disadvantages; therefore, it is important to consider which method will be the most successful in each situation. Many factors must be assessed before deciding on the best method to use to allow the best success rate with minimal amount of harm to the environment. These factors include the location of the honeysuckle (public or private land), the personnel doing the actual work, and how difficult it is to access the honeysuckle.

Mechanical removal involves using physical force and tools to remove honeysuckle. This often consists of cutting, mowing, and uprooting of the plants. Tools such as handsaws, diggers, shovels, and mowers are employed while using the mechanical method of removal. Cutting and mowing are effective methods for quickly

clearing large areas of honeysuckle. Mowing is limited, however, to when the plants are still young and relatively small in size (Smith, & Smith, 2010). Unfortunately, cutting and mowing are temporary solutions at best, due to the fact that the plant will continue to grow after these treatments. Follow-up removal is necessary to control the plants when using these methods of control. Complete removal of the root systems is needed to permanently destroy them. Physically pulling up the plants by hand is possible when the plants are young and small. However, when the plants are larger, tools such as shovels or mechanical root diggers can be employed to uproot the plants. This method of pulling up the plants can be very time consuming when working with large amounts of honeysuckle, and can have negative effects on the soil as well. Removing the roots of honeysuckle loosens the soil in the area and makes it more vulnerable to soil erosion, which can cause the soil to become deposited in watershed areas through runoff water.

Chemical removal is also a viable option. This method usually employs the use of herbicides sprayed directly onto the plants in order to kill them. Foliar spraying involves spraying the leaves of the plants with the herbicide of choice. Effective herbicides used are glyphosphate and tryclopyr, which come in brands such as Round Up and Crossbow (Smith, & Smith, 2010). These herbicides will be diluted with water and loaded into sprayers that can be pumped and released with the use of a hand trigger. The herbicide will be applied to the plant until all the leaves are wet, but not to the point where there is runoff. This method requires a relatively small amount of time per plant, so it can be effective on large areas. Unfortunately, the use of chemical sprays to control honeysuckle comes with negative side effects as well. The herbicides are so effective at killing plants that they can kill native species that live near the honeysuckle. Extreme caution must be taken not to spray anything other than the honeysuckle itself. Also, it is important not to spray a plant unless there is direct access to it. Otherwise, the risk of spraying native plants is greatly increased. Chemical herbicides can also be hazardous to human health, so care should be given not to come in contact with herbicides. Chemical spraying is a great option in the fall when large amounts of native plants have become dormant. This allows the removal of honeysuckle without the destruction of native plant species.

One method that is very effective and has few drawbacks is the cut stump technique, which is a combination of chemical and mechanical removal. This process involves using a saw to cut the stems of the honeysuckle as close to the ground as possible. After this is done, a chemical herbicide can be painted onto the area of the cut with a brush in order to kill the plant. When applying this method, stems are counted as they are cut (IPAW.org, 2008). Then, the number of painted stems is counted until the amount of stems that were painted is reached. This ensures that all stems have been treated. This method is effective and environmentally friendly. Another positive aspect of this technique is that the chance of applying herbicide to non-native species is low. In addition, the roots remain in place, so soil erosion is not a threat. The only drawback of this type of removal is that it can be more time consuming than other methods.

Choosing the right method of removal is a very important step in getting rid of honeysuckle, and many factors must be taken into account. These include the size of the plants, which correlates with the time of year. Also, the surrounding environment must be carefully inspected to ensure a method that will do more harm than good is not used. We would like to use the cut stump removal method because the benefits outweigh the minimal drawbacks. This technique seems to be the best solution for the removal of honeysuckle.

Discussion

Our plan is to organize the effort in removing the invasive bush honeysuckle in the OSU corridor of the Olentangy River. With the resilience and speed with which it spreads, bush honeysuckle has become a problem that can be addressed in a much better way than it currently is. The best way to ensure that removal efforts will have a lasting effect is to focus the strike on the most afflicted areas. With each involved organization focusing on only one section of the removal project, the coalition will work as a single entity rather than a few different groups with similar intentions and goals.

The preferred removal method, the cut stump method, has the lowest risk of negative impact on the environment. In using herbicide to kill the bush honeysuckle, the amount of soil that will erode post-removal is minimized. This method also minimizes

the impact of the herbicide, as the application focuses on the honeysuckle, rather than being sprayed in its general area. Using this method, negative ecological impacts are minimized.

Our greatest challenges will be convincing all of these organizations to work together and attracting skilled volunteers. Our group believes that we can combat these challenges because this plan will reduce costs for each group by maintaining only one communal set of equipment rather than each group purchasing or renting equipment for their own removal efforts. Columbus Recreation and Parks will provide and maintain a pick-up truck for removing brush, as well as wood chippers and chainsaws. Their involvement would also increase the effect of removal efforts, as they would be more focused. Additionally, volunteers are not difficult to come by on a university campus, though many will probably need to receive certification in chainsaw and herbicide use to be most effective. One way we'll gain volunteers is by utilizing The Ohio State University's Pay It Forward program. This program organizes large and small scale volunteer events by posting them on its website, which is frequented by students who are in need of a volunteer opportunity.

The honeysuckle removal we are proposing will have a side effect of loosening soil and increasing soil erosion into the Olentangy. In order to lessen this impact, we plan to plant seeds of native species and allow enough time for native seed stock to take root as the honeysuckle dies. More information is still needed as to which seeds should be used and how much. This should prevent much of the erosion that would occur. In addition, a temporary berm could be created along the Olentangy to prevent sediment from entering the water while native flora returns to the watershed.

A possible extension of our work could be monitoring the Olentangy to see how much sediment enters the river despite our efforts. This information would be useful for combating soil erosion in the future. In order to study the impact of honeysuckle removal on native flora and fauna, we plan to conduct surveys and view the research that has already been conducted on this topic. With these surveys, we'll be able to see if the honeysuckle we removed is growing back or not, and adapt our methods appropriately.

The Ohio State University's Wilma H. Schiermeier Olentangy River Wetland Research Park is an area affected by invasive honeysuckle. Officials at this establishment complain of honeysuckle outcompeting native species and being an eyesore to visitors. Speaking with the staff of the wetlands is what led our group to the realization that a coalition to remove honeysuckle would be a good idea. Although our plans are to start our coalition at a public park, we hope that after our group becomes an established force, we can move our efforts to the wetlands to start removing honeysuckle there.

Conclusion

Invasive Bush Honeysuckle is a problem for native flora and fauna. It out-competes native plants, which subsequently impacts other organisms that depend on these plants for food and shelter. While there are a few organizations currently taking action to remove the plant, a concentrated effort would be more effective. Combining the efforts of these local environmental institutions will allow for more organized and efficient removal of honeysuckle, and will hopefully set a standard for other groups elsewhere in the U.S. We hope that by doing so, we can create a removal effort that will have a lasting impact on the region.

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