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|  | **Issaquah Environmental Council** |

**Memo**

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| **To:** | Jane Greene, Intern Manager |
| **From:** | Lejanna Bayha, Intern |
| **Date:** | March 19, 2014 |
| **Re:** | Recommendation Report for Study of English Ivy Removal at BC |
|  |  |

Attached is the report for my study, “English Ivy Removal Strategy at Bellevue College: A Recommendation Report.” I’ve completed the tasks described in my proposal of February 11, 2014: survey the choices available for removal of English Ivy, compare and contrast the above methods for cost, effectiveness, safety and feasibility, Compile a list of suitable native alternative plants that are effective in controlling erosion, and analyze my findings and prepare the recommendation report.

To perform this research, it was necessary to first understand why removal of English Ivy is important. Next, I surveyed the choices available for removal and compared them for cost, effectiveness, safety and feasibility. Then I compiled a list of suitable native alternative plants that are effective in controlling erosion. Finally I analyzed my data and compiled this report.

I found that the best overall means of removal is the manual method because it provides very effective results with a low amount of risk. This labor intensive method entails pulling the English Ivy out of the ground, cutting it off of vertical surfaces and the digging up of older, larger roots. The main risk related to this method is the mild toxicity of the sap, which may bother those with sensitive skin; the solution is to wear gloves, long sleeves and long pants. After manual removal, it’s advisable to follow up with the smothering method of removal. This is an inexpensive way of making sure that any ivy and/or roots that are missed will die off.

The best alternatives for replacement are native plants because they provide appropriate habitat for local wildlife without overcoming our ecosystems. They are low maintenance and provide erosion control as well.

On the basis of these findings, I recommend that IEC provide the data in this report to BC.

Thank you for allowing me the opportunity to research this topic in depth. If there is to be any further work done on this subject, I would appreciate working on this topic with you again. If you have any questions or comments, please contact Lejanna Bayha at 206-650-0690.

English Ivy Removal Strategy at Bellevue College: A Recommendation Report

Prepared for: Jane Greene, Intern Manager

Issaquah Environmental Council

Prepared by: Lejanna Bayha, Intern

Issaquah Environmental Council

March 19, 2014

**Abstract**

“English Ivy Removal Strategy at Bellevue College: A Recommendation Report”

Prepared by: Lejanna Bayha, Intern

Issaquah Environmental Council

On February 24, 2014, Jane Green, Intern Manager at Issaquah Environmental Council, approved my proposal for researching and comparing the cost, safety, feasibility and effectiveness of five different English Ivy removal methods, 1) manual, 2) chemical, 3) cultural, 4) smothering and 5) goats, at Bellevue College. Providing a list of suitable alternative plants was also included in the scope of research. To perform this research, it was necessary to first understand why removal of English Ivy is important. Next, I surveyed the choices available for removal and compared them for cost, effectiveness, safety and feasibility. Then I compiled a list of suitable native alternative plants that are effective in controlling erosion. I found that the best overall means of removal is the manual method because it provides very effective results with a low amount of risk. This labor intensive method entails pulling the English Ivy out of the ground, cutting it off of vertical surfaces and the digging up of older, larger roots. Additionally, the removal site should be covered with mulch afterwards to prevent any English Ivy that was missed from growing. The best alternatives for replacement are native plants because they provide appropriate habitat for local wildlife without overcoming our ecosystems. I recommend that IEC shares the information in this report with BC.

Keywords: English Ivy, noxious weed, invasive species, manual removal, alternative native plants, smothering, mulch, ivy dessert, environment

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Executive Summary

The Bellevue College campus currently uses English Ivy as a groundcover to control erosion. English Ivy is not a native plant and was introduced in the United States as an ornamental, evergreen, groundcover. It grows very well in our climate and has become an invasive species that threatens our own environment. In 2002, King County listed it as a class C noxious weed (English Ivy, 2010) and is strongly advising landowners to remove it.

On February 24, 2014, Jane Green, Intern Manager at Issaquah Environmental Council (IEC), approved my proposal for researching the cost, safety, feasibility and effectiveness of five different English Ivy removal methods, 1) manual, 2) chemical, 3) cultural, 4) smothering and 5) goats, at Bellevue College.

To perform this research, I learned why removing the English Ivy is important, what the removal methods are, compared the removal methods and made a list of alternative plants.

My conclusion is that a combination of manual removal and smothering work well together and provide an effective solution with a minimal amount of risk. Native plants should be used as replacements because they cause no damage to our environment and require little maintenance. I recommend that IEC share these findings and conclusions with Bellevue College.

Introduction

The Bellevue College campus currently uses English Ivy as a groundcover to control erosion. English Ivy is not a native plant and was introduced in the United States as an ornamental, evergreen, groundcover. It grows very well in our climate and has become an invasive species that threatens our own environment. In 2002, King County listed it as a class C noxious weed (English Ivy, 2010) and is strongly advising landowners to remove it. It has the following negative impacts to the environment (Simon, 2004).

* *English ivy reaches the tree canopy and shades out*

*deciduous foliage during summer months, suppressing*

*the host tree.*

* *Dense ivy cover deprives the bark of normal contact*

*with air and microorganisms.*

* *English ivy adds substantial weight to a tree. The*

*estimated weight of ivy removed from a tree in Olympic*

*National Park was 2100 lbs.*

* *Mature trees covered with ivy are top-heavy and more likely*

*to blown down.*

* *Thick ivy mats can accelerate rot and deteriorate structures.*
* *English ivy changes the natural succession patterns of*

*forests.*

* *Ivy limits understory regeneration by blocking sunlight*

*and shading out plants.*

* *The fast-growing ivy competes for water and nutrients.*
* *The shallow mat-like root system make it a poor choice for*

*erosion control, and contributes to erosion in some cases.*

* *Providing hiding areas for rats and other vermin.*

If left unchecked, English Ivy can take over forests and form ivy deserts. Ivy deserts are areas where the native plants have mostly been choked out (Society, 2013). As an educator of the next generation, Bellevue College has a responsibility to set an example of stewardship for our environment instead of contributing to the devastation of our natural lands.

On February 24, 2014, Jane Green, Intern Manager at Issaquah Environmental Council (IEC), approved my proposal for researching the cost, safety, feasibility and effectiveness of five different English Ivy removal methods, 1) manual, 2) chemical, 3) cultural, 4) smothering and 5) goats, at Bellevue College.

Initially, I needed to understand why removing the English Ivy was important because that would help me to better assess the removal methods. Next, I surveyed the choices available for removal and compared them for cost, effectiveness, safety and feasibility. Then I compiled a list of suitable native alternative plants that are effective in controlling erosion. Finally I analyzed my findings and prepared this report.

I found that the best overall means of removal is the manual method because it provides very effective results with a low amount of risk. This labor intensive method entails pulling the English Ivy out of the ground, cutting it off of vertical surfaces and the digging up of older, larger roots. The risk related to this method is the mild toxicity of the sap, which may bother those with sensitive skin; the solution is to wear gloves, long sleeves and long pants.

After the English Ivy is gone, the best alternatives for replacement are native plants because they provide appropriate habitat for local wildlife without overcoming our ecosystems. Additionally native plants provide superior erosion control when compared to the shallow roots of English Ivy (Washington Native Plant Society, 2012). Some colorful examples are Salal, California Honeysuckle, Tall Oregon Grape, Beach Strawberry and Thimbleberry.

Figure . English Ivy Climbing a Cedar Tree, Copyright Lejanna Bayha

Using the results of my research I recommend that IEC work with Bellevue College on a strategy for the removal of English Ivy from their college campus.

In the following sections, I provide additional details about my research methods, the results of my study, the conclusions that I formulated from those results and my recommendation.

Research Methods

To compile the research authorized by Jane Green, Intern Manager at Issaquah Environmental Council (IEC), I broke the project into four tasks:

1. survey the choices available for removal of English Ivy
2. compare and contrast the above methods for cost, effectiveness, safety and feasibility
3. compile a list of suitable native alternative plants that are effective in controlling erosion
4. analyze my findings and prepare the recommendation report

In the following discussion of how each task was performed, I explain the reasoning which guided my investigation.

***Task 1. Survey the choices available for removal of English Ivy***

While learning about the various methods of removal, I searched for three types

of resources: library books, periodicals and websites. I came up empty handed

while searching books and periodicals but I found a wealth of information on the

Internet. The six types of websites that I relied on were:

* Government websites which advocated the removal of English Ivy due to its status as a class C noxious weed and/or invasive species
* Non-profit organization websites which advocated the removal of English Ivy as responsible stewardship of the environment
* University websites which had good general information on invasive species
* Business websites for goat rental
* Newspaper websites that had articles regarding goat rental
* Online review websites that contained information on propane weed burners

.

I found the majority of useful information on government web sites, especially when it came to the manual removal method.

***Task 2. Compare and contrast the above methods for cost, effectiveness, safety and feasibility***

While comparing and contrasting the removal methods, I found that most of the information that I needed was provided in the above materials but I did have to

find more information regarding costs and supply specifications. This extra

information was provided by the following sources:

* Vendor websites such as Home Depot and Amazon
* Landscape companies

The most difficult item to research was the cost of manual removal. Landscaper’s websites simply did not have that type information on their websites. Eventually it was necessary for me to have a phone conversation with a representative from MJW Services Inc, regarding scope and cost of manual removal.

***Task 3. Compile a list of suitable native alternative plants that are effective in controlling erosion***

Finding alternatives plants and some general information on them was the easiest part of my research because I ran across this information while I was researching Task 1. I was also able to find photographs of almost all of the plants on <http://wikipedia.org>. Wikipedia is my favorite place to find pictures because if they are not already in the public domain, the copyright owner provides information on sharing.

The difficulty that I ran across with this task was presentation. Due to the large number of alternative plants, it was important to present the information in an easy to view format that caused the least amount of visual confusion. I decided to use an Excel chart to take advantage of its organized appearance. The problem that I found with Excel is that it doesn’t have the capability for working with a list of resources like Word does. The best solution that I came up with was to provide a link to the copyright information, underneath each picture.

***Task 4. Analyze my findings and prepare the recommendation report***

I drafted this report and shared it with my intern peers for review. I have followed

most of their suggestions for this final version of the report.

Results

In this section, I present the results of my research. For each of the four tasks, I provide the most important data.

***Task 1. Survey the choices available for removal of English Ivy***

The removal methods that I researched are manual, chemical, cultural, smothering and goats.

* Manual pulling, cutting and digging is often mentioned as the preferred method of removal throughout King County’s website. It’s very labor intensive work but is considered by many to be the most effective means of removal. There are two stages of manual removal:
* Trees and Other Vertical Surfaces should have English Ivy removed first because the plant grows berries when it grows upwards. The berries are consumed by birds who spread the seeds to other areas.
* English Ivy needs to be removed from the ground as well otherwise it will quickly spread and crowd out native plants.

Tools used for manual removing are work gloves, long pants, long sleeved shirts, pruning shears, lopping shears, pruning saw, flathead screwdriver and shovel/spade.

* Chemical removal is usually targeted for young plants because older plants have a waxy surface on the leaves that is resistant to herbicides. Sometimes chemicals are used after manual removal to keep the ivy from coming back. Several applications are usually required. The herbicides typically used are (Swearingen & Diedrich, 2009):
* Triclopyr (e.g., Garlon® 3A and Garlon® 4)
* Glyphosate (e.g., Accord®, Glypro®, Rodeo®)

These work best when temperatures are above 55 degrees Fahrenheit and when it won’t rain for the next 24 hours. These chemicals can be harmful to humans, native plants, water sources and wetlands so it’s important to follow all product warnings.

* Cultural removal refers to burning with a blow torch and requires going back to deal with new growth, until the plant dies (English Ivy, 2010). Many people that posted in Internet forums regarding this method are under the incorrect assumption that burning the plant to ashes is required and take great personal satisfaction in this. The ivy is actually killed by having it’s moisture boiled as is described in an online review of propane weed burners (Product Reviews & News from Virtual Seconds, 2014):

*The right way is to direct a split second of heat at the weed so*

*that it wilts, bleeding moisture out of the entire root structure.*

*This only really works on weeds that are less than four inches*

*tall.*

* Smothering ivy can be accomplished with mulch and cardboard except on steep slopes (King County Department of Natural Resources and Parks, Water and Land Resources Division, Noxious Weed Control Program, 2009). This can also be done after manual removal to prevent new sprouts. Use eight inches of mulch with optional use of cardboard under the mulch for maximum effectiveness. Leave the mulch sitting for two years before planting something else in the area.
* Goats can and do eat English Ivy and are worthwhile comparing to the manual removal method. They can almost entirely remove it after visiting an area for a couple of years in a row and work faster than human crews (McDonald, 2007). One of the nice things about using goats is that you don’t have to worry about how to dispose of the ivy that’s been removed. Rental companies will keep someone on site for the duration of the project to monitor the goats and move their temporary electrical fencing when they need to move on to a new section of land.

***Task 2. Compare and contrast the above methods for cost, effectiveness, safety and feasibility***

As specified in my proposal, I have presented this information in chart format for easy comparison. See Figure 2 for the chart.

My research regarding cost shows that the goat method is more expensive than the manual method, when taking into consideration that the goats will need to come back a second time, a year later. When not taking the repeat visit into consideration, the goat method can cost the same or more than the manual method.

The smothering and goat methods tied for the top place in safety and the only risks associated with these two methods are the facts that native plants can inadvertently be smothered or eaten. Goats are not bothered by the English Ivy sap that is mildly toxic to humans.

Even though the manual method is the most labor intensive, it removes the ivy without any restrictions. It’s also the most effective method that can be used for all stages of English Ivy growth.

*Figure 2. Comparison Chart of Removal Methods*

***Task 3. Compile a list of suitable native alternative plants that are effective in controlling erosion.***

The best alternatives for replacement are native plants because they provide appropriate habitat for local wildlife without overcoming our ecosystems. Additionally native plants provide superior erosion control when compared to the shallow roots of English Ivy (Washington Native Plant Society, 2012)

What follows is a partial list of alternative plants that make good groundcover. For a more complete list with photographs and growing conditions, please see Appendix A.

* Bunchberry/Canadian Dogwood
* Dewey Sedge
* Henderson Sedge
* Fringe Cup
* Foamflower
* Inside-out Flower
* Large-leaved-avens
* Piggy-back Plant/Youth-on-age
* Slough Sedge
* Twinflower
* Vanilla Leaf
* Wild-ginger
* Wood Sorrel

Conclusions

In this section, I present my conclusions for the logical choice of English Ivy removal, based on my research and comparison of the different methods available.

The best method of English Ivy removal is the manual method. While it is the second most expensive and is labor intensive, it has the following advantages:

* Low risk: The sap is mildly toxic and can bother people with sensitive skin. This can be mediated by wearing gloves, long sleeves and long pants. A second risk involved with this method is the disturbance of hornet nests that may be tangled with the vines in a tree. This can be completely avoided by cutting the vines at shoulder height and again at ankle height, around the circumference of the tree. The ivy that is left above shoulder height will eventually die and fall off.
* Highly effective: All of the ivy can be removed at once if attention is paid to the digging out of roots that are left behind after pulling. All stages of ivy growth are addressed.

I’d like to note that with any of the removal methods, it’s possible to miss some of the ivy and/or roots which would cause new growth in the future. The most effective way to combat this is by using a combination of methods. An inexpensive and safe follow up to manual removal is the smothering method. The manual method will remove the majority of the English Ivy and smothering can be used as a means of suppressing any new growth. The mulch that is used for smothering should be kept in place for two years, after which it can be disturbed for placement of alternative plants, which are listed in Appendix A.

Recommendation

I recommend that Issaquah Environmental Council share my findings and conclusions with Bellevue College so that they can learn of the importance of English Ivy removal, learn how to remove it effectively and be informed on appropriate alternatives. Since Bellevue College is shaping the minds of the future generation, it’d important for them to set the example in regards to the stewardship of our environment.

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Appendix A: English Ivy Alternatives

|  |  |  |
| --- | --- | --- |
| **Photographs** | **Plants** | **Growing Conditions from http://www.ivyout.org/ivyalt.htm** |
| http://en.wikipedia.org/wiki/File:Rubus\_ursinus\_10689.JPG   |  | | --- | |  | | Pacific Blackberry (Rubus ursinus) | *Tolerates full sun, part sun, clay, and seasonal flooding (not recommended for home landscaping)* |
| |  | | --- | |  | | Sword Fern (Polystichum munitum)  http://en.wikipedia.org/wiki/File:Polystichum\_munitum\_(Jami\_Dwyer)\_001.jpg | *Sun or shade; dry to moist (clean up in March to look fresh)* |
| |  | | --- | | http://en.wikipedia.org/wiki/File:Gymnocarpium\_dryopteris\_0318.JPG | | Oak Fern (Gymocarpium dryopteris) | *Shade or partial shade; dry to moist* |
| http://en.wikipedia.org/wiki/File:Athyrium\_filix-femina0.jpg   |  | | --- | |  | | Lady Fern (Athyrium filix-femina) | *Sun to shade: moist soil* |
| |  | | --- | | http://en.wikipedia.org/wiki/File:Salal\_berries.jpg | | Salal (Gaultheria shallon) | *Sun to partial shade; dry to moderate moisture (needs to be brush cut periodically)* |
| |  | | --- | | http://en.wikipedia.org/wiki/File:Lonicera\_hispidula\_3094.JPG | | California Honeysuckle (Lonicera hispidula) | *Tolerates full sun, part sun, full shade, clay, seasonal flooding, and deer* |
| |  | | --- | |  | | Low Oregon Grape (Mahonia nervosa)  http://en.wikipedia.org/wiki/File:Mahonia\_nervosa\_5003.JPG | *Likes part shade. and is tolerant of deep shade* |
| |  | | --- | | http://en.wikipedia.org/wiki/File:Mahonia\_aquifolium.jpg | | Tall Oregon Grape (Mahonia aquifolium) | *Sun or shade, drought tolerant, dry to moist well drained sites* |
| |  | | --- | | http://en.wikipedia.org/wiki/File:Arctostaphylos\_uva-ursi\_25924.JPG | | Kinnikinnick (Arctostaphylos uva-ursi) | *Sun, some shade: well drained soil* |
| http://en.wikipedia.org/wiki/File:Fragariachileonsis.jpg   |  | | --- | |  | | Beach Strawberry (Fragaria chiloensis) | *Sun to partial shade; dry to moderate moisture* |
| http://en.wikipedia.org/wiki/File:Rubus\_parviflorus\_9481.JPG   |  | | --- | |  | | Thimbleberry (Rubus parviflorus) | *Sun to shade, moist to dry* |
| **Photographs** | **Climbers** | **Growing Conditions from http://www.ivyout.org/ivyalt.htm** |
| |  | | --- | |  | | Western Trumpet Honeysuckle  (Lonicera ciliosa)  http://en.wikipedia.org/wiki/File:Lonicera\_ciliosa\_13335.JPG | *Partial to full shade* |
| **Photographs** | **Groundcovers** | **Growing Conditions from http://www.ivyout.org/ivyalt.htm** |
| http://en.wikipedia.org/wiki/File:Cornus\_unalaschkensis\_9282.jpg | Bunchberry/ Canadian Dogwood (Cornus unalaschkensis) | *Partial to full shade; humus rich soil* |
|  | Dewey Sedge (Carex deweyana) | *Sun to partial shade; moist to dry* |
|  | Hendeson Sedge (Carex hendersonii) | *Partial shade to shade: moist* |
| |  | | --- | |  | | Fringe Cup (Tellima grandiflora)  http://en.wikipedia.org/wiki/File:Tellima\_grandiflora\_11202.JPG | *Moist shade to partial shade* |
| |  | | --- | |  | | Foamflower (Tiarella trifoliata)  http://en.wikipedia.org/wiki/File:Tiarella\_trifoliata\_21629.JPG | *Partial shade to shade; moist soil* |
| |  | | --- | |  | | Inside-out Flower (Vancouveria hexandra)  http://en.wikipedia.org/wiki/File:Vancouveria\_hexandra\_6350.JPG | *Sun to shade; moist to moderate moisture* |
| |  | | --- | |  | | Large-leaved-avens (Geum macrophyllum)  http://en.wikipedia.org/wiki/File:Geum\_macrophyllum\_10101.JPG | *Sun to partial shade* |
| |  | | --- | |  | | Piggy-back Plant/Youth-on-age (Tolmiea menziesii)  http://en.wikipedia.org/wiki/File:Tolmiea\_menziesii\_6537.JPG | *Partial shade to shade; moist soil* |
| |  | | --- | |  | | Slough Sedge (Carex obnupta)  http://en.wikipedia.org/wiki/File:Carnupta.jpg | *Moist shade* |
| |  | | --- | |  | | Twinflower (Linnaea borealis)  http://en.wikipedia.org/wiki/File:Linnaea\_borealis\_8803.JPG | *Partial to full shade* |
| |  | | --- | |  | | Vanilla Leaf (Achlys triphylla)  http://en.wikipedia.org/wiki/File:Achlys\_triphylla\_1033.JPG | *Partial sun; dry to moist soil* |
| http://en.wikipedia.org/wiki/File:Oxalis\_oregana\_4988.JPG | Wild-ginger (Asarum caudatum)  http://en.wikipedia.org/wiki/File:Asarum\_caudatum\_10993.JPG | *Shade; moist soil* |
| <http://en.wikipedia.org/wiki/File:Oxalis_oregana_4988.JPG> | Wood Sorrel (Oxalis oregana) | *Shade; wet or dry soil* |
| **Photographs** | **Subshrubs and Shrubs** | **Growing Conditions from http://www.ivyout.org/ivyalt.htm** |
| |  | | --- | |  | | Common Juniper (Juniperus communis)  http://en.wikipedia.org/wiki/File:Jeneverbes.jpg | *Sun to partial shade; dry to moist soil* |