

Urban foraging

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1.0 Introduction

Alternative food systems like local and organic are becoming increasingly popular. This is due to a variety of reasons including concerns about climate change and peak oil which conventional agriculture has been implemented in contributing to (Nasr, MacRae and Kuhn, 2010). There are concerns that climate change and peak oil could result in reduction in food production which may lead to food insecurity. As defined by the *People's Food Policy* Food security refers to "equitable access to food" (People's Food Policy, 2009). This need for secure accessibility to food is particularly important in urban settings as urban dwellers generally rely on food purchasing instead of producing food themselves (De Zeeuw and Dubbeling, 2009). With the threat of environmental change looming, urban areas must find alternative ways to access food. This paper will present urban foraging as a possible option in obtaining food security in urban areas.

Foraging for wild edibles is an important part of human diets (Addis et al, 2005). Wild foods were the primary source of food for hunter-gatherer societies (Bharuca and Pretty, 2010) and continue to be important in a contemporary context. A study by the FAO in 1992 estimated that 62% of people living in developing countries obtain food from their direct environment (FAO, 1992). Pimental et al (1997) estimates that upwards of 300 million people annually rely on forests for some or all of their food consumption. Wild foods are particularly important during food shortages and famine (Addis et al, 2005). Very little academic research exists about the importance or potential for collecting edible wilds in developed countries and in urban settings.

Despite the lack of research many grassroots organizations in North America are using urban foraging as a route to accessing nutritional, local food as well as a path towards food security. In considering the activities that urban foraging organizations participate in a definition of urban foraging would include collecting wild and cultivated food in an urban setting to promote community building, reduction of food waste, redistribution of food and reduction of hunger in the area. Of course we use the word *wild* very loosely in the context of an urban environment as it is very unlikely that these plants have not in some way been influenced or altered by human activities. A study by the Institute for Culture and Ecology (2010) portrays urban foraging as an important aspect to consider within the urban ecosystem which can have significant social, economic and cultural importance to the individuals who are foraging.

This project is focused on developing a map of wild foods on the University of Waterloo (UW) campus. This project will continue with the grassroots tradition of urban foraging by putting the map on a publically accessible, interactive website that the public can add onto. This will hopefully promote community learning and community participation. Ultimately we will address whether urban foraging is possible on the campus and if it can provide university students with a viable alternative food system. We have chosen to focus on university student food security because students represent a very low income group that often have inadequate nutritional intake (Burke et al, 2009). This paper uses primary and secondary research to determine the plausibility of urban foraging in general and specifically at on the UW campus.

This paper will outline possible barriers, benefits and results that were found in regards to urban foraging. As well a map of edible species on the UW campus will be provided.

2.0 Purpose and objectives

The University of Waterloo currently has a population of twenty-three thousand full time students. The university's Federation of Students (FEDS) provides only one place to obtain free food (UW Food Bank) (FEDS, 2010), in addition to the Waterloo Region's Food Bank. This leads us to our research question: "*Is urban foraging a potential food source for university students?*" We will approach this question with specific objectives in order to assess the potential of urban foraging.

Our first objective is to see whether or not urban foraging is a viable alternative food source for university students. We hope to map out the potential edible wilds within the surrounding area around of Laurel Creek. In addition to this, we will review literature on other foraging initiatives within North America.

Our second objective is to better understand how urban foraging fits into the alternative food system. This objective will be met through a literature review of other initiatives and its implementation at a global scale.

3.0 Literature Review

Very little academic research exists about urban foraging. The term *wild food* is generally only used within urban environments to refer to expensive, gourmet products like

wild meats and fiddleheads. There is however a lot of literature about the importance of wild edibles in global south countries. We have also reviewed literature about the growing demand for alternative food system and why this reasoning relates to urban foraging. Also in order to gain perspective into urban foraging as it exists in North America we conducted a literature review of active urban foraging organizations websites.

3.1 Importance of Wild Edibles in Global South Countries

Wild edibles are an important food source for people globally. The FAO estimates that close to one billion people consume wild foods as a part of their diet (Aberoumand, 2009), this includes indigenous communities in industrialized countries including; Canada, New Zealand, Australia and The United States (Bharucha and Pretty, 2010). Wild edibles are particularly important in the rural parts of global south countries. Hunter-gatherer and agricultural communities are particularly reliant on wild foods, although the line between cultivated and wild becomes blurred as these communities actively maintain their wild food supplies (Bharucha and Pretty, 2010). These wild foods and other wild plants are an important economically, culturally and spiritually for the communities that collect them (Addis et al, 2005).

The use of wild edibles has been more prevalent for areas that experience food insecurity than those that are relatively food secure. Foraging is also particularly important in times of famine and food shortage (Addis et al, 2005). Wild food is very important to the diets of particular groups. This is described in a study in which communities in isolated areas of the

Canadian north have become increasingly nutritionally insecure with the transition from wild meats to store-bought products (Samson and Pretty, 2006).

Many of these studies are concerned that despite the importance of wild edible, they have been left out when addressing food security and vulnerability; these studies generally only include cultivated foods. This could result in little effort to conserve these important species or the traditional knowledge about them (Bharucha and Pretty, 2010). They call for the need to include wild edible when determining global eating patterns.

The importance of wild food globally is reassurance that foraging can be important both socially and culturally in an urban environment. Also this literature has revealed the fact that urban foraging can be important for people who experience food insecurity like students and low- income individuals and could be an important tool in times of food shortages.

3.2 Alternative Food Systems

There is increasing consumer dissatisfaction with the food system. This has meant the increased popularity of alternative food systems such as; local, fair trade, organic, cage free, etc. (Howard and Allen, 2010). Fair trade particularly, has seen immense success. In 2007, Fair Trade Certified products earned \$2billion US and sales continue to grow (Raynolds, 2009). Local products are also becoming popular; it is estimated that 6-10% of UK citizens actively buy local. These products are therefore becoming more popular and consumers are willing to support alternative food initiatives.

The Howard and Allen (2010) study found eight reasons as to why consumers were buying alternative foods, including; safety, nutrition, treatment of animals, environmental impacts, working conditions, influence of large corporation, wages, and how far food travels, respectively. This represents that fact that consumers are concerned about the inequality and environmental degradation that happens because of an industrialized and globalized food system and are actively trying to combat it.

Many of the reasons for purchasing alternative foods listed in the Howard and Allen study (2010) could also directly pertain to urban foraging. Urban foraging is able to affect nutrition as wild foods are known to be an important source of micronutrients (Bharucha and Pretty, 2010). It can also be directly implicated in environmental impacts as urban foraging offers an alternative to industrialized farming. It also provides people with a way to avoid the influence of large corporations on food, as well urban foraging will drastically cut down on the distance food has travelled as foraged food is from as far away as the people are willing to travel. Urban foraging can therefore have an appeal to these sorts of concerned consumers because it has similar benefits and we therefore believe that urban foraging can be popular and successful.

4.0 Review of Other Urban Foraging Initiatives

In researching other similar urban foraging initiatives in North America, fifteen active organizations including three from Canada were found. The Canadian organizations included; *KW Urban Harvester*, *KW Urban Harvest* both in Kitchener/Waterloo and *Not far From the Tree*,

in Toronto. All but the three Canadian projects and one project based in Oregon were in California. The major priority of these organizations is building community through food. They encourage using urban foraging to get to know your neighbours and share food with all. Three projects in particular; *The Lemon lady*, in Clayton California, *North Berkeley Harvest* and *Village Harvest* in San Jose foraged fruit in order to donate to food banks and feed the hungry. The majority used interactive maps to make the location of these wild foods public.

Forage Oakland (forageoakland.blogspot.com) is a particularly active group that supports urban foraging in order to create a paradigm shift in the way food is thought about; sharing food, knowing neighbours and the reduction of food waste. *Forage Oakland* particularly emphasizes exchanging and bartering for these fruits so that personal connections are made. The *Fallen Fruit* ([Fallen Fruit.org](http://FallenFruit.org)) group in Los Angeles similarly promotes community building by harvesting local fruit. As well they emphasise the need to reduce the gap between those who have little food and those who have a lot to an equal distribution. They also put together events called “public fruit jams” where members of the community are asked to bring in their harvested or home-grown fruit to contribute to communal jams. The *Not far from the Tree* program (notfarfromthetree.org) in Toronto is one of the few projects that do not have a map although they are planning to have one in the future. Torontonians with fruit trees on their lawns contact *Not far From the Tree* who pick the tree for the owners and then split it in three ways, one-third goes to the owner, one-third goes to the volunteers, and one third is given to a food bank or a shelter.

There is also one scholarly approach to urban harvesting that is going on. *The Institute for Culture and Ecology* in Seattle are in the process of a study they call “Foraging, Gathering and Stewardship in Seattle’s Urban Ecosystem.” The justification for this study is to map the urban foraging activity in the Seattle area so that planners and policy makers can better accommodate this foraging (ifcae, 2010). This project also emphasizes the social, cultural and economical importance of foraging which can have important implications for the resiliency of cities. They also hope to gather knowledge about how foragers care for the urban forests in hopes of adapting these strategies into municipal policy (ifcae, 2010). The project is not expected to be done until 2012, when the results of the study will be available.

All of the grass-roots organizations seem to be solely focused on fruit trees and other conventional foods like berries, whereas our project will include all of the edibles that are available on the Waterloo campus, especially unconventional foods such as weeds and invasive species. We think that this is important to promote diverse diets and will promote foragers to learn about a greater variety of plants in their area.

5.0 Barriers

5.1 Knowledge of Edible Wilds

Knowledge is a barrier because very few people are very familiar with many edible wilds, making the prospect of pursuing foraging daunting. Any attempts to forage a large variety of species requires knowledge about plants in the area as well as any plants that should

be avoided. People also require knowledge about responsible foraging techniques or else these edibles may not be available in the next growing season.

It is important that partaking in urban foraging be limited to those who have proper knowledge. Many edible wilds guides like Petersen's *Edible Wild Plants* warn about "imposter" plants which are poisonous plants that are similar looking to specific edibles (Petersen, 1977). Water Hemlock for example is a very poisonous plant and looks very similar to Water Parsnip which can be consumed (Petersen, 1977). Therefore people should show caution when foraging for wild plants and should perhaps avoid any plant that have an "imposter" relative.

5.2 Unsustainable on a Large Scale

The practice of urban foraging does not come without environmental concerns. Yes, it is an untapped resource that can increase food security for a region, but it should be practiced in a marginal fashion (King, 2009). Harvesting of a fruit tree (i.e. crab apple tree) is very different from harvesting from a non-vascular plant (i.e. fiddleheads). If you pick all the apples from the tree, the organism itself will not be harmed other than it will not be able to bear fruit for reproductive dispersal. However, in the case of fiddleheads, if harvesting is not done in a sustainable manner, the species may not appear in the same locale the next season (King, 2009; Seymour, 2002; Welsch, 2006). It is important that the act of foraging not be too popular at specific sites. If popularity continues the biophysical environment could be damaged because of over-harvesting, which in turn, goes against the definition of "sustainable foodscapes" (Brill, 2009; King 2009).

5.3 Time and Effort

Actively pursuing urban foraging requires a lot of time and effort. As mentioned in previous sections, foraging for food requires a lot of knowledge about wild foods. Learning about the species available in the area, when they are available as well as responsible foraging techniques requires a lot of time. As well, actually going out foraging requires a lot of time and effort; returning to tress until the fruit is ripe, carrying home very heavy parcels, finding new sources as the seasons change, etc.

Because we have decided to target students a group to possibly pursue urban foraging there is concern that they will not have the time or put in the effort to urban forage. Urban foraging can be a really great alternative food source for students, but the limited time that students have may mean that it is easier for them to go to a grocery store to buy food than to forage for it.

5.4 Seasonal, Dietary and Area Restraints

In mapping the UW campus we found that there was very little green space. The only large green areas were the area adjacent to Laurel Creek and Technology Park. Even when green space did exist there was concern about contamination due to proximity to roads or to Laurel Creek; which was found in 2003 to have twenty-five times the acceptable level of bacteria (Lake Ontario Waterkeeper, 2003). Therefore the applicability of foraging on the UW campus may be limited and foragers may have to go outside of the UW campus to find more edibles.

Also because of the winter season that is experienced in Canada, growing season and therefore foraging season is limited to only about half of the year. Individuals who want to supplement the majority of their diet are therefore restricted by season and will have to undertake preserving techniques in order for the wild edibles to be available to them in the winter season. Also because foraging generally only includes fruits and vegetables people will still have to supplement their diets with foods from other sources (i.e: supermarkets) in order to maintain a healthy diet.

6.0 Benefits

6.1 Food Security

One very important goal for countries is to be able to adapt to the effects of climate change and peak oil to become food secure. This is especially important for urban populations because in 2008 urban populations officially outnumbered rural population and by 2030 56% of the population is expected to live in urban areas (De Zeeuw and Dubbeling, 2009). Urban populations are particularly vulnerable to becoming food insecure because they generally rely completely on the purchasing of food from outside areas instead of growing food themselves. This makes urban populations vulnerable in times of recessions and rising food prices. Their distance from food growers also make them particularly susceptible to oil shortages if transportation has to be decreased (De Zeeuw and Dubbeling, 2009).

Climate change will be particularly threatening to food security in urban areas with growing populations when food production becomes limited. In order to decrease these

vulnerabilities and work towards climate change mitigation it is particularly important for urban areas to start producing their own food (Nasr, MacRae and Kuhn, 2010). A good way to start sourcing food locally is to harvest the wild foods that already exist. Along with increasing urban agriculture these two activities can act to mitigate climate change in cities because this will increase urban green space which will act as carbon sinks and reduce any flooding (De Zeeuw and Dubbeling, 2009). In contrast to urban agriculture, harvesting urban edibles will not need any added water resources or present any health issues because the plant species are already present and adapted to the area.

Waterloo is one of many cities in Canada that are part of the transition town program. This program promotes cities to implement initiatives and opportunities for cities to adapt and take advantage of the effects of climate change and particularly the effects of peak oil (transitionnetwork.org). Focusing on increasing food security by sourcing food locally is important in these kinds of initiatives. The consequences of peak oil may happen very quickly and we should be prepared and able to feed our communities when it happens. Having a publically accessible wild food map can be an important way for people to source food. The case study of Cuba, who reached peak oil in 1989 with the collapse of the Soviet Union and the US embargo, is a good case to look at in regards to dealing with oil shortages. Cubans were unprepared and had to adapt quickly (Hiranandani, 2009). Although Cubans were successful at adapting fairly quickly many people went hungry during the first few years (Morgan, 2006). In the case of Canada, our reliance on high-input agriculture and global imports could make for a not so smooth transition. If actions are not taken quickly to address food security in the face of

peak oil and/or peak oil many people could go hungry and an urban foraging map could be used as a famine map to protect people from starvation.

6.2 Food Sovereignty

The People's Food Policy Project (PFPP) defines food sovereignty:

“The heart of food sovereignty is reclaiming decision-making power in the food system. This means that people have a say in how their food is produced and where it comes from. Food sovereignty seeks to rebuild the relationship between people and the land, and between those who grow and harvest food and those who eat it” (People's Food Policy, 2009).

Urban foraging can be a step toward achieving food sovereignty on an individual basis. At the core of the definition given by the PFPP is decision-making. Urban foraging allows individuals to make all of the decisions about their food. Foragers decide where the food comes from and what kind of food it is (within the limitations of the environment) as well foragers can monitor their food directly and make decision about what areas are safe to harvest and what kind of food they truly enjoy to eat. Urban foraging also presents another choice in alternative food systems and therefore another choice about what kinds of institutions and systems to support. This can be an important option for individuals who wish to rely less on grocery store and pharmaceutical companies. This will provide an alternative avenue to source foods and medicines locally while avoiding large corporations.

Also urban foraging bridges the gap between people and land as well as harvester and eaters. Foragers must be aware of the land in order to know when and what to collect (Addis et al, 2005). Also as a forager, the harvesters and eaters are generally the same people. By making eaters into harvester urban foraging eliminates this gap. Urban foraging also includes community building through sharing and collecting food which also contributes to closing the gap between, growers, harvesters, and eaters as foragers explore their neighborhood, talk to their neighbors and share their food, just as Forage Oakland suggests (forageoakland.blogspot.com). Urban foraging can therefore greatly contribute to the food sovereignty of individual people, whether these individuals are students or any other member of the KW community.

6.3 Nutrition and Accessibility for Students

Urban population, especially the urban poor are vulnerable to malnutrition because of their reliance on processed, packaged and fast foods. They are often denied access to fresh foods due to high prices (De Zeeuw and Dubbeling, 2009). By giving the urban poor the ability to access fresh fruits and vegetables in their local neighbourhoods their intake of nutrition could be increased.

This can be particularly important for students; who generally rely on pre-made foods from restaurants. Burke et al (2009) conducted a study for the American Diabetes Association. This study took place at an American University and found that students were unhealthy. The health risks found were high rates of being overweight, high cholesterol, high blood pressure, high sodium intake and little exercise (Burke et al, 2009). In this case, having access to fresh,

nutritious edible wilds could greatly increase student health. On the UW Campus for instance there is a high density of junk food and high fat pre-made foods. By providing an edible wild food map of the UW campus students can have direct access to fresh foods which provide a lot of nutrition.

Also we have identified students as a low-income group. Howard and Allen (2010) found that low-income groups were the least likely to purchase alternative food products. High cost may restrict students from supporting various alternative food systems, even if they do desire to support these products. Urban foraging provides students with an alternative food system that costs little to no money, only time and effort. Urban foraging therefore can enable students to be able to support alternative food.

6.4 Food Waste Reduction

Food waste is also becoming an important issue. “On average 0.6kg of solid waste is produced on average per city inhabitant per day (De Zeeuw and Dubbeling, 2009, 11).” This only includes market waste, wastes of agro-industries, restaurants and households (De Zeeuw and Dubbeling, 2009). The waste from unused wild foods, especially fruit trees can also be large. Any unused fruits fall to the ground and are left to rot. Whereas this food can serve an important part in providing food security and food sovereignty, as well as access to fresh nutritious food for students. Therefore it is important that it is not wasted. In order to mitigate this waste and cease all of the important benefits of urban forage individuals must go out into their neighbourhoods and collect this food.

7.0 Methods

In addition to a literature review, our first objective requires collection of primary data to assess whether or not urban foraging is a viable resource for university students. Data was collected in the late fall of 2010 with the usage of a handheld Geographical Positioning System (GPS). Further extrapolation was completed on the data to produce a map using Geographic Information Systems (GIS).

7.1 GPS and GIS methodology

Mapping out the edible wilds within the university campus boundaries is important in accessing whether or not urban foraging is a viable alternative food source for university students. We wanted to see if the campus landscape was conveniently located and had an abundant source and variety of edible wilds. It is vital that there be an adequate source so that an influx of students interested in urban foraging do not overharvest or degrade the environment in which the edibles grow. A GIS is the best way to approach this (methodology below was as recommended by Longley et al., 2006 and Slocum et al., 1999).

What is a GIS? And what is a GPS?

GIS, or Geographical Information Systems, is used to display and analyze spatial data, which are tied to databases. This connection is what gives GIS its power: maps can be drawn from the database and data can be referenced from the maps. When a database is updated, the associated map can be updated as well. GIS databases include a wide variety of information including: geographic, social, political, environmental, and demographic. GIS uses layers, called "themes," to overlay different types of information. Each theme represents a category of information, such as roads or forest cover (whole paragraph cited by: ESRI, 2010).

GPS, or Global Positioning System, is a satellite-based navigation system made up of a network of satellites placed into orbit. GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to earth. GPS receivers take this information and use triangulation to calculate the user's exact location. Essentially, the GPS receiver compares the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver how far away the satellite is. Now, with distance measurements from a few more satellites, the receiver can determine the user's position (whole paragraph cited by: Garmin, 2010).

A GIS was applied firstly by collecting primary data, which are the edible wilds on campus. The primary data is found using a handheld GPS. We then choose whether a location or area is either in the form of point or polygon shapefile. The determination of whether a wild edible was a point or polygon was dependent on whether it was a perennial or annual, respectively.

The point and polygon shapefiles of the data collection was developed into two spatial databases; (i) edible perennials (points) and (ii) edible annuals (polygons), which were overlaid on top of a UW campus map layer. These databases will be established through usage of *Gamin's MapSource*, which is available as freeware to Internet users. This freeware is important as this project expands and participants are able to readily access the software freely and can contribute their own GPS coordinates of edible wilds on campus.

In the database, each dataset (e.g. a tree) is accompanied by a GPS coordinate reference with an associated jpeg photo and character sketch (i.e. recipes, edible components, seasonality, taxonomy).

Data was collected in a grid format as shown below (Figure 1), with the main focus on the Laurel Creek region (E4-E6), which runs between ring road and the colleges (St. Jerome's and Conrad Grable). We anticipate the map to expand in the coming years to include the whole campus.

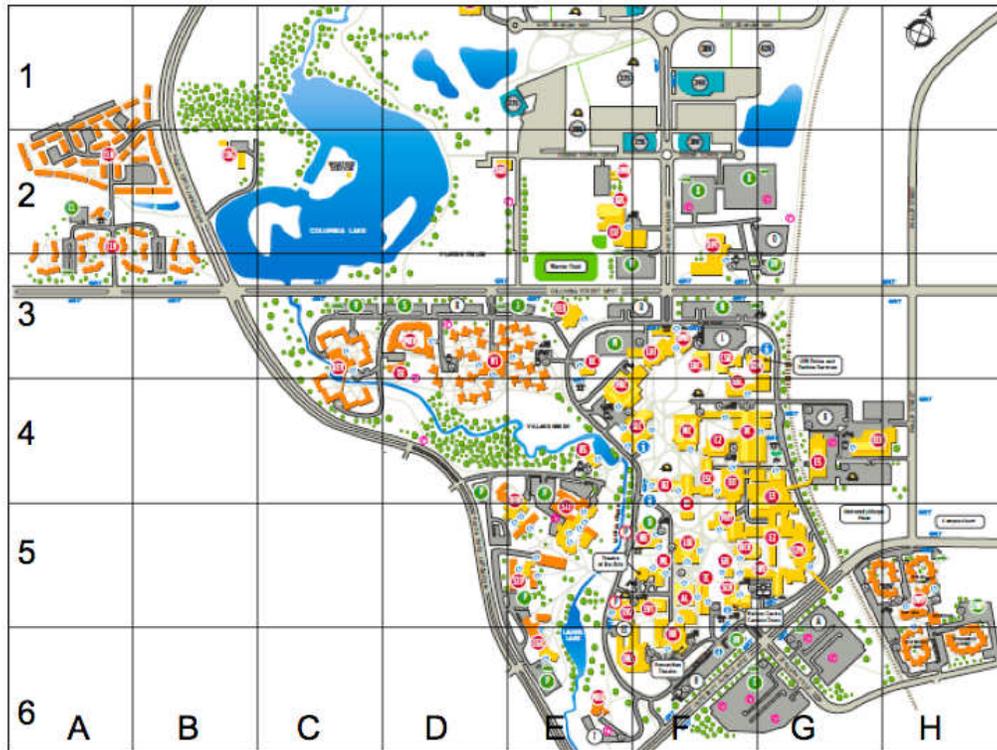


Figure 1: A grid system of the UW campus map was established to identify areas of particular interest for mapping out waypoints and polygons as GPS coordinates.

The data was collected in a series of days in late fall 2010, using a Garmin handheld GPS. 36 unique wild edibles were identified within our knowledge on campus (Table 1). The table also identifies whether the item will be listed within the database as either a point or polygon shapefile. In addition, throughout our site of interest, multiple points of reference were found for many of the wild edibles.

Table 1: Unique database identifiers for varying species of edible foliage found on the University of Waterloo campus during late fall of 2010.

Unique Identifier:	Shapefile
Apple tree	Point
Bitter cherry	Point
Broadleaf plantain	Polygon
Buckthorn	Point
Burdock	Polygon
Catnip	Polygon
Cedar trees (Eastern White)	Point
Clover	Polygon
Coltsfoot	Polygon
Dandelions	Polygon
Eastern Joe-Pye Weed	Polygon
Evening primrose	Polygon
Garlic mustard	Polygon
Goldenrods	Polygon
Hawthorn (downy)	Point
Lambs quarters	Polygon
Lettuce saxifrage	Polygon
Malin	Polygon
Maple Tree	Point
Milk weed	Polygon
Mint	Polygon
Mother's ward	Polygon
Oak tree	Point
Pacific crap apple	Point
Pin cherries	Point
Prickly lettuce	Polygon
Raspberry	Polygon
Rose	Point
Service berries	Point
Spotted touch me not	Polygon
Sumac	Point
Thistle root	Polygon
Wild garlic	Polygon
Wild grape	Point
Wild strawberries	Polygon
Winterberry	Polygon

8.0 Methods

The University of Waterloo was established in 1957 and has six distinct faculties. The University of Waterloo is affiliated with four colleges (St. Paul's, Renison, St. Jerome's, and Conrad Grebel). There are currently twenty-three thousand full time students, nine-hundred and seventy-five faculty members and one thousand eight hundred and fifty-one staff members. The President of the University is Feridun Hamdullahpur and the Vice-President Academic is Geoff McBoyle. There are four executives who make up the FEDS and Brad Moggach is the President (whole paragraph cited by: UW, 2010).

The issue of student hunger easily goes unnoticed on campus especially with high tuition cost and lack of awareness. Within the university, FEDS provides a "confidential, no questions asked" food bank. Unfortunately, the fact that the university has a food bank on campus also goes unnoticed. Unassumingly located in the SLC 2108, about 200 volunteers keep the UW FEDS Food Bank open from 8:30am-8:30pm on weekdays every term. The beginning of the school terms is when the food bank gets the most visits. After that, traffic is fairly constant. It serves 50-60 students per term. All that is needed is a valid student identification card (WATCard) to get up to 10 lb of food per visit (whole paragraph cited by: FEDS, 2010).

The only other food bank is The Food Bank of Waterloo Region's distribution center in Waterloo. They collect about 3 million pounds of donated food each year and distribute it to over 70 different food programs throughout the region. These programs provide direct service in the form of food hampers, hot meals etc. Together with these programs, they assist about 25,000 people each year (The Food Bank of Waterloo Region, 2010). However, this source is

often inconvenient for students to access (FEDS, 2010).

This research proposal is focused on whether urban foraging has the potential of being an alternative food source for university students. The specific site is around the UW banks of the Laurel Creek running from the Village 1 residence towards the intersection of Westmount Road and University Avenue. The site was selected due to its known diversity of wild edibles.

8.1 Basic Step for Foraging

There are three basic safety steps to keep in mind during the foraging process (as suggested by Brill, 2009), which are:

- (i) Identify everything you desire to eat with 100% certainty, as imitation within the plant kingdom can have devastating effects.
- (ii) Avoid collecting in areas sprayed with chemicals such as highways and train tracks, due to herbicides that are often sprayed.
- (iii) Only harvest in small portions to allow for proper re-growth and only in sites where the plant is in abundance.

These basic are very important component for first time adventurers of wild edible foraging and especially even more if they plan to expand their area of foraging to outside the UW campus. It is better to be introduced to urban foraging by someone that has experience in plant identification.

9.0 Recommendations

To be able to introduce urban foraging to the university community, we have three recommendations.

Our first recommendation is to set up workshops available on campus for the exchange of knowledge. Workshops should be geared towards identification of wild edibles and the etiquettes behind responsible foraging. These workshops will hopefully create an environment that will provide encouragement and confidence for first time foragers.

Our second recommendation is to set up community forums. These community forums will create a social network linking other urban foragers on campus. These events such as 'collection outings' and skill sharing could be set up and advertised to others within the community.

Using edible wilds' guides for Canada may be overwhelming for new urban foragers. As our last recommend, we suggest that a site-specific guidebook for Waterloo Region and more specifically the university campus be developed. Along with the development of a site-specific edible wilds food guide, there should be an online database available to the public on edible wilds. This online database should be able to be adjusted and added onto by the public.

10.0 Conclusion

There is a lot of opportunity for urban foraging on the University of Waterloo campus. We were able to identify 36 edible species within the scope of our knowledge. There are potentially more sources that can be identified with future contributions of the public. Within

the short time available for this project, we were able to develop a foraging map for the fall (Appendix). Due to the region's seasonality, maps should be developed according to the seasonal varieties on campus. We have identified certain barriers to urban foraging but we feel that they can be overcome if our recommendations are implemented. We hope UW students and other community members will get involved in this project in the near future and hopefully the map and knowledge base will expand from our initial findings.

We feel that urban foraging can be a positive step forward in achieving food security and food sovereignty. This is because it provides an alternative food source for urban dwellers that are at risk of being food insecure. Also it gives individual the ability to know where their food comes from and to harvest food for themselves. This is particularly important for student in urban settings whom we have identified as being food insecure and as having low-incomes. A major step toward food security can also include food waste reduction which can be achieved through urban foraging.

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