

Introducing public edible landscapes as a key component of the urban agricultural framework

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Abstract

In our ever-growing urban environments food security is dwindling. Healthy food may be difficult to find in city centers, but publicly owned land is still common. In many cities, a significant percentage of green space is publicly accessible and regularly maintained. Under appropriate circumstances these green spaces can be utilized to grow edible food and benefit the cities and communities they are placed in. Claims of the benefits of public edible landscapes include: beautification, strengthening communities, food security, ecological services, self-sufficiency, education and may lead to a more positive attitude towards urban agriculture. Existing organizations working with public edible landscapes in three US municipalities of varying size were used as case studies to explore strategies and challenges in proposing, implementing and maintaining public edible spaces. Interviews were conducted with representatives from the Beacon Food Forest in Seattle, WA, the Dr. George Washington Carver Edible Park in Asheville, NC, and the Upper Valley Apple Corps in Hartford, VT. These case studies identified common concepts related to the success of public edible landscapes: a presence of community interest, actively involved individuals with a skill set in food production, the presence of an umbrella or advocacy organization, and support from city officials. A discussion of approaches being used by others could provide the foundation for future research into the effects of introducing edible plants into public green space on the local community and environment.

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Definitions

For this report, the following definitions were used:

Public land - land that belongs to the local or municipal government for functions that benefit the public at large and are openly accessible to the population, examples include municipal parks, right of ways or easements along streets and sidewalks, and lands around municipal buildings, like courthouses and libraries.

Perceived Public land - land that is owned by a private citizen, business, civic institution, or other organization but is readily accessible by those who pass by, a common example would be land that is along a sidewalk or on the edge of a property next to publicly owned land.

Commons – An openly accessible area of which it’s resources are shared by all members of the society and is owned by no one.

Permaculture - A type of agriculture, commonly tied to the field of sustainable agriculture (but is generally applied to personal, social, economic and environmental systems as well), that employs a set of principles that create and regenerate an ecologically integrated system; the term is derived from the combination of “permanent” and “agriculture”.

Food Forest - A system of food production, common to permaculture and agroforestry, that mimics a forest ecosystem, generally consisting of layers to include a tree canopy, subsequent layers of secondary trees, shrubs, and vertically vining plants and tertiary layers of herbaceous crops to cover the ground as well as extend beneath the soil surface in the form of root crops. These plantings are meant to work synergistically with minimal interference from humans but are claimed as highly productive food sources.

Fruit Tree Guild - A customary practice within permaculture that employs an intentional diversity of plants that symbiotically support food producing plants by exploiting each plant’s

natural function for purposes such as nutrient uptake and availability, achieving pest-predator equilibrium, and optimizing soil health and water holding capacity.

Fiscal Sponsor - A legally tax exempt, under 501(c)3 federal status, organization that supports a group or project whose purpose adheres to the overall mission of the sponsoring organization, by allowing the group or project to receive the benefits of tax exempt status including the ability to receive grant funding and accept tax deductible donations.

Memorandum of Understanding - A signed document that describes a formalized agreement between parties related to an outlined subject with defined terms that parties must meet; it is commonly used by parties that may not have legal authority to enforce a contract.

Work party - an event, including staff and volunteers, meant to achieve a multitude of tasks needed at that time, this is essentially a work day but with the added benefit of interacting with others involved and may involve a meal.

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Dedication

I am dedicating this to any group or community making efforts to move towards a more sustainable food system.

Chapter 1 - Introduction

The world population is growing exponentially. It is estimated that of the 9.8 billion people that are expected to live on earth in 2050, 66% will inhabit urban areas. The urban population in the US alone has climbed from 64.2% in 1950 to approximately 82% of the total population today and is expected to reach 87.4% by 2050 (United Nations, 2014). With the growing size of our urban areas and the declining arable land available for feeding these 9.8 billion people, this poses a need to improve the current food system and its ability to produce more food on less land (Martellozzo et al., 2014; Foley et al., 2011; Eigenbrod and Gruda, 2015).

Urban food systems face a greater vulnerability to food insecurity, especially in times of crisis from factors including political, economic, and environmental conflict (Barthel et al., 2015). Among the challenges that are present globally, including a changing climate, less available land, depletion of soils, stresses to water quality and availability, threats from pests and reliance on nonrenewable resources for fertilizers, fuel and pesticides, cities currently rely heavily on processing and distribution systems to bring food in from elsewhere (Foley et al., 2011; Eigenbrod and Gruda, 2015). The densely populated nature of urban areas forces city dwellers to rely on outside sources for the bulk of food consumed. Open space is limited in cities and usually comes with a greater economic value than the spatial equivalent in rural areas. It is suggested that the total urban land area needed to feed the current urban population is less than 10% (Martellozzo et al., 2014), many cities have already devised plans to enhance public greenspace that could be utilized in a more efficient way for urban agriculture.

Urban agriculture (UA) has become much more prominent in recent years. It is being performed using many types of farming from structural facilities like vertical or rooftop production to soilless systems as well as more traditional methods including allotment gardens

and edible landscapes. Urban agricultural endeavors can offer many benefits including ecological and social services to the cities that employ them (Rogus and Dimitri 2014; Mendes et al., 2008; Hodgson et al., 2011) and participation in urban agriculture has been shown to improve the dietary intake of fruits and vegetables of those who participate in its activities (Carney et al., 2012). The majority of literature regarding UA focuses on privately owned or marginalized parcels of land however. This report aims to expand the topic to include publicly owned land by looking at projects that exist in cities of different sizes and regions in the US.

Given the many and diverse uses of urban land, especially in areas with a history of industrial development or barren sites of recently demolished structures, there may be hazards, such as polluted soils, that make placement of food producing crops in urban spaces more challenging than in most rural areas (Attanayake et al., 2014; Hodgson et al., 2011). Public greenspaces, whose historic use is likely to have been documented and more regulated than privatized land, may pose less of a potential threat of contamination.

Current rationales for urban agriculture can usually fall into one of three major motivations: self-reliance, efficacy for the localization of food, and most significant to the case of public edible landscapes (PELs), the resurgence of a collective Commons (Tornaghi and Van Dyck, 2014). The most important to the idea of PELs as opposed to more traditional forms of UA, is the restructuring of the Commons. This concept of a PEL as the recreation of the Commons is not without its criticisms (Dooling 2009, Hardin 1968, Lee & Webster, 2006).

The concept of the Commons is one that has been a focus of study in the social sciences especially when considering natural resource management. It was brought about by Garrett Hardin's *The Tragedy of the Commons* in 1968, as he famously described a pre-privatization English grazing land where any herdsman was likely to take advantage of the open accessibility

to graze more cattle than his fair share of the communal space because it was in his best interest, ultimately leading to overgrazing and degradation. His paper which claims of human inability to prioritize the good of all over the good of the self, has been contradicted by others however.

Elinor Ostrom argues that this tragedy is not inevitable and that there can be factors, including normative behavior, reciprocity and a group's ability to create and enforce rules, that lead to self-regulation when the society is interacting together regularly (Ostrom et al., 1999). Within an urban Commons interaction is unavoidable due to population density. Also, when the collective resource is dependent on intensive labor as with urban agriculture, there is a greater chance for these dealings to take place.

The creation of a collective Commons for urban agriculture could engage the general public in creating an active memory (Tornaghi and Van Dyck, 2014) of the skill set related to food production and its importance earned by the process of participation. Urban agriculture, and respectively PELs, may work to shield its participants from the generational loss of such skill sets, due to a detachment from food production.

Tornaghi and Van Dyck (2014) identify the importance of case study research in moving public policy towards the shared use of public land for agricultural purposes. By adding to a scrutinized pool of information related to the processes involved in creating and maintaining PELs, information can be shared, replicated, and further validated by research (Tornaghi and Van Dyck, 2014). Scholarly support for PEL projects may also aid in the persuasion of skeptical stakeholders. Research related to cases of PELs is still limited however, and the method of practitioner-researcher type study used in the case of the Edible Public Space Project in Leeds, UK (Tornaghi and Van Dyck, 2014) faces the criticism of a loss in objectivity from the researcher who displays a vested interest in the project. In this exploratory multiple case study,

the researcher remained separate from the projects explored to objectively learn from the experiences offered.

The objectives of this study are to assess currently used strategies related to proposing, implementing, and maintaining PELs for three cases in varying locations, identify approaches based upon commonality among these sites that can foster success, and recognize other outcomes and challenges faced by these organizations. The purpose is to further the discussion of effective strategies in practice, addressing concerns, and measuring the outcomes of incorporating edible plants into public green space and their impacts on the community and environment.

Chapter 2 - Methods

In order to understand the experiences of PELs in the United States telephone interviews were conducted. The scripted interviews were designed to investigate the steps taken from planning and proposal, through preparation and implementation, to management strategies and outcomes in three separate PELs that are currently operating. Sites were selected based upon varied municipal size and regional location, as well as willingness to participate.

Representatives, familiar with these steps, one from The Beacon Food Forest located in Seattle, WA, one from The Dr. George Washington Carver Edible Park in Asheville, NC and two from the Upper Valley Apple Corps in Winsor County, VT were interviewed. Interviews were approximately two hours, and the calls were recorded and transcribed. Information presented was then reviewed and conclusions drawn on what the specific experiences of these existing PELs can provide to the nationwide conversation of incorporating edible crops into public green space.

Chapter 3 - Selected edible public landscapes

Table 1 Overview of Edible Public Landscape Sites used in the Case Studies

Site Name	Management Organization	Location	Municipal Size*	Crop type	First Year
Beacon Food Forest	Beacon Food Forest/Seattle Department of Neighborhoods	Seattle, Washington	608,660	Annual/ Perennial fruit, nut, vegetable, herb	2009
Dr. George Washington Carver Edible Park	Bountiful Cities	Asheville, NC	83,393	Perennial fruit nut and herb	1997
Multiple sites	Upper Valley Apple Corps	Windsor County, VT and surrounding area	56,670	Annual/ Perennial fruit, nut, vegetable, herb	2011

*population according to 2010 US census data

Seattle, WA

Seattle, Washington, the largest city under consideration, with a population density of 7,250.9/mi² (US Census 2010) is home to one of the most famous PELs in the US, the Beacon Food Forest (BFF) (Table 1). Located on a slope along Jefferson Park in the Beacon Hill Neighborhood, it is not far from downtown and highly urban. The area surrounding the park is mostly residential with a large cultural diversity, the representative interviewed estimated perhaps 60 different languages are spoken in the neighborhood. Signage at the park can be read in five of the most prominent languages. The area surrounding the park has been historically disadvantaged, though this was not a factor in placing the BFF in that area. Their major mission is to reconnect people with where their food comes from, potential food security is simply a bonus.

Planning and Proposal

The design of the BFF was the product of a permaculture design course in 2009, a collaboration among four people. A few of the designers wanted to see if this could be something the neighborhood would be interested in, so they turned to an advocating organization Seattle's Department of Neighborhoods' P-Patch Community Garden Program (DNPPCGP) that has been working with the city since 1973 to establish community gardens. Through this partnership they were awarded a starting grant of around \$3,000 to do marketing in order to hold a public discussion and receive community feedback for the project. Later, once interest had been determined and the city was willing to consider the proposed addition to the Jefferson Park and Community center the BFF received additional funding to hold three public design meetings in the summer of 2011. These funds helped in creating marketing materials to reach the public for things like bookmarks featuring the BFF logo, post card mailings, and posters. These were organized to determine what the public would like to see in the park, for example, open space for gathering and child play as well as lots of berries.

The BFF sits on a portion of land owned by the Seattle Public Utilities Department of the City (SPU) that is financially supported by waste and water services. SPU has a strict policy on the land use as it must be appropriately collecting and storing water. Because of these restrictions, obtaining this land is not common, but the DNPPCGP aided in the permitting process. Currently the BFF and DNPPCGP operate according to a memorandum of understanding. This agreement stated that BFF be a site for 26 "P-Patch" allotment gardens, which are separate from the freely accessible PEL, and in turn granted the help of a coordinator from DNPPCGP to aid in getting the land established, by hiring contractors for more heavy work, and especially early on in gaining approval by the board of SPU. One of the founders of

BFF had already established a relationship with the director of SPU in a previous park project, however gaining momentum for approvals ultimately relied heavily on public support by showing attendance and enthusiasm of the three public design meetings. Additional headway likely was made because of a city-wide initiative. In 2009 the City of Seattle put forth a Parks and Open Space Levee to make community improvements in greenspace. This was instrumental in establishing the BFF due to a grant of \$100,000 awarded that December to start the project. This grant was not sought out by BFF, it was presented to them from the city.

Preparation and Implementation

Being situated on a slope, the higher ground consisted of soil inadequate for planting, so implementation included leveling of the land for a gathering plaza and building of raised allotment gardens. This infrastructure building stage also included bringing in urbanite, or chunks of broken concrete, which was used to create retaining walls and was donated by a concrete recycling company in the area. Wood chips added atop compost, intended to amend the poor soil quality, was provided by the city as a result of annual tree pruning. An irrigation system was also a necessary addition, and the water supply is also provided by the city for sites associated with the DNPPGP. Other major contracting costs came from the Seattle Parks and Open Space Levee grant funding. Planting began in October of 2012.

Management Strategies

According to the representative interviewed, a large component of the success of BFF was the result of the awareness risen by an article that was published during the planning stage, that gained global attention. Because of this recognition, not only did work parties prosper, with

between 100-150 volunteers coming to help at each during the first growing season, but this attention may have also helped motivate city officials to allow for the project and grant funds. Now, as the plants have matured, work parties are held once a month instead of twice and usually involve 60-80 persons. Watering is done through the delegation of a watering crew. Special volunteer sessions occur during the Spring and Summer known as “Sunset Gatherings” that include a bit of work accompanied by an educational component on a weekly basis.

The volunteer leadership of the BFF, thus far, has taken the form of a committee structure including a “steering committee” which meets once a month to coordinate overall operations. Other leadership bodies active in managing the BFF include a “site development committee”, who plan maintenance and work party tasks and host a monthly volunteer orientation, also a “nutty team” who work to organize the nutritional components, specifically utilizing the food forest to coordinate a meal for each work party, and an “education team” to prepare classes on activities related to permaculture and the food forest itself.

Outcomes

One of the challenges posed however, is that the memorandum of understanding states that since the site is on public grounds, BFF is not able to gain from the land therefore they cannot sell the produce grown. This only creates an issue because they would like to be able to pay guest educators for teaching various skills and subjects. The current solution is that they are leasing an area adjacent to the BFF so that they can hold classes there. Because of this challenge and other challenges related to raising funds under fiscal sponsorship, BFF plans to create a non-profit called “The Food Forest Collective” allowing for 501 (c) 3 federal tax status. This is

motivated by the drive to be able to do more education and participation in building similar community projects away from the Beacon Hill location.

Along with the growth of forming a supportive nonprofit, land expansion of the BFF is now reaching phase two. The existing one and three quarters acres will be doubled with both a free-to-forage food forest and additional allotment gardens to match the existing 26 currently in use. The original drawing was for 13 acres, but after open planning meetings the city approved a total of seven, with the stipulation that BFF start with a small section to prove viability before expansion. At the time of the interview, the second phase had been planned but environmental permits were pending approval from the construction and land use department for moving dirt and putting in impermeable surfaces. The vision for full expansion is likely to take place in four phases according to BFF representative. The fame and rapid growth of BFF can be attributed to many factors working together, including city initiatives, public relations achievements, devoted leadership, and a supportive community.

Asheville, NC

Asheville North Carolina is a medium sized city, with a population density of 1,855.9/mi² (US Census, 2010) located in the Blue Ridge Mountains of the Southeastern United States (Table 1). The Dr. George Washington Carver Edible Park (GWCEP) is likely the oldest PEL in operation today. Now at full maturity it serves as a long-term case within this study.

Planning and Proposal

The GWCEP in Asheville, NC was created in 1997 by an initiative between a former nonprofit organization City Seeds, and the Asheville Parks and Recreation Department with the help of a group of students from Warren Wilson College (Sezak-Blatt, 2010). The site is owned by the City of Asheville and is situated in the downtown area at the Stephens-Lee Recreation Center on what went from a high school to a trash ridden vacant parcel before the project began.

Preparation and Implementation

The park was designed using permaculture principles to create a low-maintenance food forest. Currently the park is home to around 40 varieties of fruit and nut species that are openly harvestable by visitors and the local community. Recent expansion of GWCEP has included grapes, figs and hardy kiwi along the walkway down to the main portion of the park which has a winding boardwalk around an orchard of peaches, pears, apples, paw paws, persimmons, chestnuts and plums. This expansion aimed to display food producing plants along the more traveled portion of the park.

Management Strategies

In 2002, Bountiful Cities, a local non-profit organization took over management of the park after the original founders left the area. Inconsistency in volunteer-based management and investment from the city led to an overall lull in activity related to more time and labor-intensive crops like annual vegetables. GWCEP once included the management of raised beds at the community center, as well. This ebb and flow of vested interest has not posed a detrimental risk to the park itself. Modeled as an agroecological system, well established plants survive with little

care only to face issues of encroachment of weeds and some invasive species, most of which is merely a cosmetic concern. Because of lulls in support Bountiful Cities, as a nonprofit, is forced to limit their time to simply facilitating management by others as they themselves do not have the staff or resources to maintain the park alone. They rely on what involvement they do have from the community and other organizations to collaborate work parties. Currently they are averaging four work parties each year with the help of the Buncombe Fruit and Nut Club which is comprised of many local growers who have the knowledge and skill set to lead tasks like pruning and assessing tree needs. According to a Bountiful Cities representative “it is imperative for the community to have the value to maintain their projects”.

The mission of Bountiful Cities is “to enliven and empower self-reliance, cooperation, and stronger communities through providing an opportunity to grow, harvest and eat fresh local produce” according to their Facebook page. They focus on providing education, curriculum, programs and resources. Specifically, resources regarding funding opportunities. Funding entities are likely to overlook a small project, which may seem insignificant, but a cumulative or aggregation of projects are more likely to get funding. Recently Bountiful Cities has been able to use this strategy to receive funding through the Aetna Foundation to hire a staff member for the “Grass to Greens” project that provided oversight to the GWCEP in past years.

Outcomes

Being the oldest public food forest in the nation, this site is not without its challenges. According to news reports, conflict occurred in fall of 2016 when the city cut down four mature and still productive trees in the park as a response to a local resident’s concern that the park needed more lighting to keep it secure. The conflict arose because of a lack of communication.

The parks entrusted management groups were not notified by the city before the trees were cut. Restitutions were made when the city planted new trees and a few more (Surlis 2016).

Community concern around limitations to urban agriculture in the city brought about the creation of the volunteer led Asheville-Buncombe Food Policy Council in 2011 to fill the gap and address policy changes (Asheville Buncombe Food Policy Council n.d.). Along the west bank of the French Broad River, Asheville, NC also exhibits food producing native plants along a city greenway called the Edible Mile. This land is owned by the local utility company, but the city holds a long-term lease on the land (City of Asheville North Carolina n.d.). In addition to these resources Asheville Greenworks is working to transform city parcels into food producing resources with its establishment of two projects, the Adopt a Spot and Food Tree Programs (Asheville GreenWorks n.d.). Because of investment in Asheville's Food Action Plan, the city and surrounding community is likely to see more resources like GWCEP, the edible greenway and public orchards in the future.

Windsor County, VT and surrounding area

In the least densely populated area studied, with 58.5 persons/mi² (US census 2010) Windsor County, including Hartford, VT and surrounding towns are being introduced to PELs in the form of fruit trees and accompanying plant guilds. The Upper Valley Apple Corps (UVAC) work to implement and maintain food producing landscapes in a multitude of settings on public and perceived public lands in the area. Their original goal was to plant in many of the town's parks, but they also received support for planting trees in private lots and businesses as well as libraries, schools and a local homeless shelter to name a few. These fruit tree guilds have handmade signs to identify species and encourage people to help themselves.

Planning and Proposal

The UVAC is not limiting themselves to the larger town of Hartford, VT, as their plantings can be found in many surrounding towns and even across state lines into Lebanon, New Hampshire. UVAC formed after a 2010 project with 350.org and Transition Town, a local organization aiming for dialog on “developing local resiliency”. For the project, known as the Raspberry Revolution, the founding group and others planted half a dozen fruit trees and a plethora of raspberry canes in a municipal park and around the town of White River Junction, VT. This event spurred interest in creating a model project to increase local food security, beautify the area, and educate while also working to strengthen the community. This group eventually became the UVAC about a year later.

While the UVAC was forming they held public meetings to address community concerns which included assumptions that fruit that fell in parks would be ingested by dogs and get them sick, or that more bees would be attracted, and children would get stung while playing in close proximity. There were also concerns about what would happen when there was fruit that wasn't harvested. Many of the trees planted are not of fruit bearing age yet, but in these cases, they would like to use the opportunity to offer education on food preservation. Other comments included skepticism that there would always be someone to maintain the trees when needed. Representatives interviewed thought that these comments were less genuine concern and more a way to ensure all possibilities related to the project were well thought through.

Management Strategies

The management of public fruit tree guilds is agreed upon verbally with the Town Tree Board that UVAC will maintain the plantings and keep them watered. These agreements have been successful so far. There is an application process for private land owners to host an UVAC fruit tree guild, however. The UVAC is able to make strides in accomplishing its goals even without a formalized leadership structure. Representatives of UVAC interviewed claim that this works for them because of the bond that the leaders have established over the years. Tasks are delegated on a volunteer basis to whoever is willing and available to participate. In larger decision making they work based upon consensus and coordinate events using doodle polls. Many of the leaders are also active in other groups in the community working towards related missions including climate change, social justice, and resilient communities.

Membership is a bit more formalized and some of their funding comes in the way of a membership tier structure. For example, a \$50 donation will help to plant a tree, and progressive increases will provide more materials.

The public installations are predominantly managed by the UVAC with an active group of volunteers averaging about 12 people, but some of the private land installations have chosen to do the management themselves. For example, the hospital has a staff team devoted to the caretaking of the plantings they have on site. To continue the partnership with hosts that do their own management, the UVAC acts as an education and consulting catalyst, by sharing newsletters and making themselves available for visits and answering questions. They do visit each tree planting annually, as well. The UVAC is a volunteer group that does not have federal 501(c)3 status, so they work under fiscal sponsorship with The Ottawaquechee Natural Resources Conservation District (ONRCD) to acquire grant funding for operational purposes. One such

financial gain included the ability to hire a coordinator, predominantly to manage partnerships and event details. Grant funding has also come through Grassroots Environmental Fund which allows for certain funding without 501(c)3 status. Major events put on by the UVAC include an annual Spring Planting Festival and a Fall Apple Pressing Party which also serve to accomplish work tasks but are coupled with a celebration.

Outcomes

Future goals for the UVAC include being able to train new members to take on leadership and educational roles. There are plans for the proposal of a Fruit Walk to connect downtown White River Junction to a nearby park with informational signage and fruit tree guilds along the way. Another plan would be to include the restoration of some of the many existing orchards already in the area that have simply fallen out of production. This would open opportunities to teach concepts like grafting and an understanding of the long-term resources they are trying to establish. Partnerships will increase as well and there is a student led proposal pending that the city refrain from planning impervious surfaces, one aspect of the proposal is to install water catchment from the roof of an entertainment arena in the park to feed into UVAC tree plantings.

The only issue the UVAC have encountered in this model is that they found one of the privately-owned sites was lost potentially due to lack of care, which may have been caused by the proximity to a large public area. In other words, it was not easily accessible to the community of the area and there was not enough motivation for the property owner to keep up with it, also the UVAC group was farther from the site as well. They are now more cautious in choosing adequate sites and remind property owners that the mission is to have free food available to the

community. The other issues they have experienced is attendance to events like the apple cider pressing.

Chapter 4 - Discussion

The resurgence of a concept

The placement of productive edible plants intentionally in public space is not necessarily new and unique, though younger generations may feel this way. Historical government sponsored initiatives like Victory Gardens in the WWII era are notable. There are also many historical landscapes that have employed the use of fruit tree species in city centers, in some European countries it is not uncommon to find fruit trees in public plazas. This is also the case for some US cities including Seattle, Washington and Boston, Massachusetts. Because these trees are becoming more valued by the public, projects to revive these once forgotten resources are occurring with organizations like City Fruit in Seattle and the Boston Tree Party. Much of the motivation behind these historical plants has been to offer food sources in times of crises.

With an increase in environmental concern and recent devastating storms, threat potential resonates with much of the public. In 2011, Hurricane Irene posed a realization that Vermont needed to address food security, as some towns were cut off for days due to extreme flooding. Damaged roadways halted supply chains until they were able to be repaired. This event occurred around the time of the formation of the UVAC which offered a potential contribution to some of the issues posed. During this flooding event a pilot project of UVAC faced only losses of annual crops, as the majority of perennial plants were able to survive. Though damaging effects may also affect PELs and result in production losses, increasing the locally available food sources is being considered by many community leaders. Addressing such concerns has led to Hartford Resilience Committee's participation in the New England Food Vision, an initiative with the goal of increasing the regions local food supply to 50% from its current level.

Importance of community partnerships

Recent growth in the demand for UA has led many US cities to put forth plans similar to that of Asheville Food Action Plan and New England Food Vision (Mendes et al., 2008). The formation of organizations and concerned citizens into groups such as Food Policy Councils, are instrumental in these actions taking place in city planning. Food security may not be the only route in encouraging more urban agriculture and specifically PELs. The BFF notes that it would not have been nearly as successful had it not been for the Seattle Parks and Open Space Levee, which holds a vision related to environmental services as opposed to food security but proved as a catalyst in a project that addresses both. These types of programs help pave the way for entrepreneurs of PELs to reach municipal leadership.

Given the models outlined in this paper, another key partnership in successful PELs is the presence of an overarching or “umbrella” organization that can also help to fill the void between the community, project and municipal system. Fiscal sponsors and comprehensive organizations like Bountiful Cities in Asheville, NC and Seattle’s Department of Neighborhoods P-Patch Community Garden Program can help to advocate for necessary policy change or aid in management downfalls. These partnerships are beneficial but may not be necessary. In the smaller community where UVAC operates, the project was able to progress throughout many municipalities mostly because of the personal connections and rapport of the UVAC leaders. The level of communication and partnership needed will vary depending on location. With any partnership it is advisable for formalized forms of communication. Memorandums of understanding were present in two of the cases explored and, as was the case in Asheville’s tree cutting incident, helped hold parties accountable in times of disagreement.

The growing of edible crops involves a level of expertise

A common concern expressed by all those interviewed was the idea of a public edible planting is usually taken well by the public, but cities do not have the staff and knowledge to maintain them and skepticism in proper management arises. The solution that these organizations have found is to utilize community members who are knowledgeable to offer advice, and both directly and indirectly help to educate other parties involved in the management.

Common to the establishment of each of these projects were persons with some type of food production knowledge. This may not be a necessity to begin a project as long as there is an ability to recruit such experts. In the Asheville area, the Buncombe Fruit and Nut Club has served as the pool of experts for GWCEP when Bountiful Cities was unable. There is a potential issue posed with the volunteer nature of PELs, as knowledgeable people may phase out or relocate and are not available to offer service to the project. Though this is not the first reason many PELs offer education it is a benefit. As experts pass on the information they know by leading work efforts and training new volunteers, they may give way to leaders that could take over in their stead. Education that takes place within urban agriculture and PELs is often claimed for encouraging self-sufficiency and resiliency, but it also can be an underlying security in ensuring that the space will be maintained into the future.

The importance of aesthetics

Many edible plant species make up the natural landscape of the US and can still be found growing in wild areas with no care but are often overlooked as a food source. This concept is one that is commonly referred to in the design of food forests. Ideally, the proper selection of food producing and supporting plants coupled with an educated design can result in a landscape that

naturalizes and can function with little human involvement. This may be a large reason why permaculture principles are popular in urban agriculture and PELs. This ability to remain productive through a lapse in care is exemplified in the history of the GWCEP in Asheville. Drawbacks to these techniques are possible. One common concern with these more naturalized plantings is that they are seen by some as messy looking. Though this may not be a view expressed by the majority, it is true that the well-manicured and less diverse plantings common to our urban public spaces are different in appearance from many of the food forests and tree guilds utilized by these projects. This is not to say that community members may not find a trade off to the aesthetic they are used to when they rationalize the added food and ecological service presented. Though it is a customary practice to hold public meetings during proposals of PELs to address community thoughts and opinions, without a completed project to reference, it may be more difficult for community members to visualize the project from a design alone.

Creating a collective Commons

Unlike many forms of urban agriculture which provide more specific products and services for a specific group, the implementation for PELs is meant to be universalized. This means that it is for everyone and by everyone. The issue here is that parties dealing with food production in public spaces may not have the same accountability for failure and misuse. All urban agriculture can face misuses such as theft and vandalism, and has on some occasions, but the nature of public spaces can clearly exacerbate this threat.

However, in PELs the tragedy of the Commons may not be truly representative of Hardin's grazing example (Hardin 1968). For PELs harvesting may seem to be a first come first serve proposition, as the public is free to forage by design. However, those that do much of the

work are not necessarily those that tend to reap the harvest. Some of this may relate to the value those involved in the work are placing on education as opposed to product output.

The overgrazing of a fruit tree will not end its production the following year. This could be a concern if the harvest posed a total plant loss like in the case of many leafy vegetables. If there were issues over competition for a harvest there is a likelihood that a single person may take all of an item, but in a diverse planting this would not deplete the total food available in the space. For instance, a BFF representative told the story of a plum tree that was full of fruit that were not fully ripe being stripped overnight. The group were happy that this tree was productive and hoped that the fruit, though unripe, was put to beneficial use. This type of event may become more common as these younger trees get older, and the local population learn more about when to harvest, but most of those involved in these projects have prepared their expectations for this kind of thing.

On the other hand, GWCEP has reaffirmed the public nature of the Commons and has developed into a resource for many of the people of Asheville. Outside of the gatherings prearranged by the managing organization, Bountiful Cites, there are other events that take place there. On weekends, for example it is common to find a local forager guiding a group through the park to help teach them about foraging (Orris, 2013). Additionally, a fall work party in 2017 was organized by University of North Carolina Asheville Sustainability, a student group which seems to be willing to take on much of the role of work this spring and manages an underutilized social media platform. This coming together around the space may relate to the age of GWCEP and its history of ups and downs but this type of shared ownership is something to be considered as other PELs age and does pose a positive attribute to addressing urban agriculture in a collective Commons. As mentioned by all representatives interviewed, although there is often the

same group of volunteers coming to help when work needs to be done, the community surrounding some of the sites regularly offer appreciation that such a resource exists.

Summary

Some aspects that are common through the three cases studied may identify potential considerations for persons interested in establishing PELs as a form of urban agriculture in their municipality (Table 2). Input was needed from the community to address concerns and build support. For these cases, maintenance was done by volunteers which means having enough active community members to fill the need for labor. When considering members for a leadership team it was beneficial to have persons with an existing relationship with stakeholders and persons with knowledge of food production. Support from other organizations that can fill gaps related to management, communication, funding, and/or policy were also highly influential. Education was addressed at each site as a major component of these PELs. Also common among the cases studied was the practice of permaculture techniques. Although these cases in Seattle, WA, Asheville, NC, and Windsor County, VT offer examples of models for PELs, each unique location will have its own attributes to be considered independently. Additionally, there are other methods to proposing, implementing and maintaining PELs that may not have been exemplified by the three cases studied here. These findings offer a starting point to introducing the concept of edible landscaping into public space.

Table 2 Common Practices Among Case Study Sites

Planning and Proposal	Preparation and Implementation	Management Structure	Outcomes
<ul style="list-style-type: none"> • Held public meetings • Utilized personal networks • Experienced individuals 	<ul style="list-style-type: none"> • Utilized permaculture practices • Attentive to community requests 	<ul style="list-style-type: none"> • Predominantly volunteer led • Rely on community involvement • “Work parties” volunteer events 	<ul style="list-style-type: none"> • Sought out nonprofit status • Strong emphasis on education

Recommendations for future research

The purpose of this report has been to introduce public land into conversations regarding potential locations for urban agriculture. Edible landscapes are a common choice for public land as they are designed for aesthetic as well as functional value, however, only a few examples are outlined in this report. Much more in-depth research is needed to make further strides in the understanding of these spaces and their impact on the surrounding community. Such research may include investigating human interest and public perception in PELs including aspects like: likelihood to participate, likelihood to consume, and overall impressions or level of attractiveness. PELs may also be considerations for social science regarding them as an urban Commons to explore the social constructs that evolve around them further. These considerations may also help to understand who the primary users of PELs are, and how to deter users from taking more than needed. There is a need to investigate more cases of PELs at varying stages of development and explore the efficacy of currently planted PELs in regard to production outputs versus inputs, as could be done in cost-benefit analyses. Investigation of water use efficiency for

edible versus traditional landscapes could also be valuable, especially looking into permaculture designs which are meant to conserve water and other inputs. Future studies may also benefit urban planning strategists to include feasibility studies for certain types of areas, including percentage of public green space needed to significantly impact food security in a given area, or the offset costs of allowing community members to manage public space as opposed to city staff.

In Conclusion

Overall, there are benefits to introducing public edible landscapes into our cities and as part of the general discussion of urban agriculture. This does not suggest that every city will be as open to PELs as they may be to privately owned urban agricultural projects, as skepticism and issues arise in regard to the use of public space. There is a growing interest in the potential for PELs that has taken place in recent years and can be exemplified by the projects explored in this paper as well as in many other cities in the US and abroad. Motivations for their use are also likely to vary according to the needs and interests of municipal areas, but further research that confirms some of the benefits and addresses concerns can aid in communication.

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Appendix A - List of Interviews

Interview by Erin K Bailey. 2018. *Representative from Beacon Food Forest of Seattle, WA*
(January 21)

Interview by Erin K Bailey. 2018. *Representative from Bountiful Cities of Asheville, NC*
(February 5)

Interview by Erin K Bailey. 2018. *Representatives from Upper Valley Apple Corps of White
River Junction, VT* (February 13)

Appendix B - Interview Script

Interview with Existing Edible Landscape

Date: _____

Location: _____

Start Time: _____

End Time: _____

Go Over Rules:

1. You will not be identified by name.
2. There are no wrong or right answers, I just want to know about your experiences.
3. Please be honest and detailed. Your response will help others know what initial steps to take and who to contact in their own community for a successful proposal of an edible landscape publicly accessible.
4. You do not have to answer the questions all at once. We can conduct the interview in stages, if it is more convenient.
5. If you are unsure of the answer to a question, but know who could answer please let me know with whom I should speak.
6. Is it alright if I record this?

******Good Probes – CAN YOU TELL ME MORE ABOUT THAT
-CAN YOU EXPLAIN WHAT THAT PROCESS WAS LIKE******

I would like to talk with you today about the [_____] and your experience in planning and maintaining it as well as the outcomes of having it in your community.

First, please tell me about your job or role with [_____].

- **This first section of questions, are intended to help learn what was involved in planning [_____].**
 - a. How did this project get started?
 - b. Who and/or what organizations were involved in planning the landscape?
 - i. If more than one, what were their roles in the planning?
 - c. How was the planning done?
 - i. Group meetings, individuals, community listening sessions?
 - 1. How did this affect planning?
 - 2. Was there a need make any changes because of this?
 - ii. Who was responsible for what?
 - d. How long did it take?
 - e. Did you have to gain approval from any municipal offices or organizations?
 - i. If NO – go to next section
 - ii. If YES – continue in this section
 - f. What agencies, offices, or organizations did you have to gain approval(s) from?
 - i. What kinds of approvals did you have to get?
 - ii. For each kind of approval and/or agency
 - 1. What did you need to do to get the approval?
 - 2. What was easy about getting the approval?
 - 3. What was challenging about getting the approval?
 - g. Is there anything else you would like to tell me about what needed to be done to get [_____] approved?

- i. Did you face any notable challenges or setbacks? How did you address or overcome these?
 - ii. Was there a method used to measure your success throughout the proposal process? If so can you explain it?

- **Now I would like to learn about the location of [_____].**
 - a. Where is [_____] located in your community?
 - i. How would you describe this area of your community?
 - ii. Is the area urban or suburban; What was the area zoned for? If residential, what type? Apartments, single-family homes? Rental or home ownership? Food desert? Nearby grocery stores? Farmers markets?
 - iii. What makes this a public location?
 - b. Is there any other general information about the site that you would like to share?
 - c. IF NOT ALREADY STATED: How was the land obtained by your organization or group?
 - i. Were there other individuals, grants or organizations that significantly assisted with this, and what was their involvement?

- **Now I would like to hear about how the landscape got installed and how it is maintained.**
 - a. Was the existing land and infrastructure adequate for growing edible plants, or were there any changes made? Difference in structure vs growing conditions
 - i. Probe: Tell me about the soil quality, water quality, sun exposure

- ii. Probe: How was that measured?
 - b. Was it installed all at once or in phases?
 - i. How long did implementation or each phase take?
 - c. Were there any notable challenges or setbacks in this process? How were those overcome?
 - d. Could you describe your management plan and who is involved in it?
 - i. Probe: How is this organized? Who is involved?
 - e. How do you allocate materials, labor, and funds?
 - i. Probe: Were there other individuals, grants or organizations that significantly assisted with this, and what was their involvement?
- **My final questions focus on the outcomes of the project.**
 - a. How did you build awareness of the landscape?
 - b. How did you promote use of the landscape? Or did you even have to do that?
 - c. What were the intended outcomes of [_____]?
 - i. Do you think they are being met?
 - ii. If so, how?
 - iii. If not, why not?
 - 1. Are there any plans to move closer to your goals?
 - d. What kind of feedback have you gotten from community members, government, businesses and other organizations?
 - i. How do you gather this feedback?

- e. Are there things you would have done differently along the way? If so, Why and how?
-
- **Concluding notes**
 - a. Is there anything else you would like to share to help those interested in proposing an edible landscape in their community? Advice, warnings, people or groups to turn to, or even just anecdotal notions worth sharing?