THE URBAN FOOD FOREST — CREATING A PUBLIC FOODSCAPE

by

XIAOYING SHI

(Under the Direction of John F. Crowley)

ABSTRACT

With the rapid growth of the worldwide population, the urban food forest has risen in popularity in the last few years. The need to improve the sustainability of urban agricultural landscapes, to solve environmental issues as well as the problem of food security has driven this new concept. However, if the urban food forest is considered as an element of urban development, we should think not only about how it might improve the urban environment, but also how to blend it better into urban spaces. This thesis will explore how we can create multifunctional urban food forests that can be integrated into public places. In addition, the thesis will look at the urban food forest as a provider of food and space that encourages public and community participation. By comparing the spaces and functions of urban public places with the specialties of urban food forests, the "from food to space" design guidelines will be summarized. Finally, these guidelines will be applied conceptually to the City Hall area in Athens, GA, which has been proposed as a "family friendly" park space in the 2030 Athens Downtown Master Plan.

INDEX WORDS: Urban Agriculture, Urban Food Forest, Open Space, Public Engagement & Participation.

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XIAOYING SHI

B.Sc.(Ag.), Beijing Forestry University, China, 2015

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF LANDSCAPE ARCITECTURE

ATHENS, GEORGIA

2018

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by

XIAOYING SHI

Major Professor:	John F. Crowley
Committee:	Shelley Cannady
	Katherine Melcher
	Maureen O'Brien

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
May 2018

ACKNOWLEDGEMENTS

I would like to sincerely thank everyone who have aided me in many ways throughout my two and half years' study in Athens and during the writing of this thesis. I am especially grateful to my major professor, Jack Crowley, for his intelligence, patience, and inspiration throughout this process. Without his guidance and persistent help, this thesis would not have been possible. I would also like to thank the members of my reading committee, Shelley Cannady, Katherine Melcher, and Maureen O'Brien, for their time and suggestions. Also, I would like to thank Melissa Tufts for her kindly help of my study and my thesis. Finally, I would like to thank my family and friends for the constant support and faith.

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CHAPTER 1

INTRODUCTION

It is green, it is edible and it is for the public.

With the growing trend of fruit and nut trees in urban public spaces, many cities around the country and the world have opted in the last 10 years or so to turn vacant city lots and patches of parks, and community parcels into urban food forests. As a part of the urban forest and also urban agriculture system, their ecological benefits and ability to solve food security problems is obvious. In addition, urban public food trees can offer unique possibilities for social and recreational services through public edible landscapes (or foodscape, a combination of landscape and edible plants) that provides food as a common-pool public produce resource (Nordahl, 2009). The urban public food forest is an attractive model for food production in areas where people need multifunctional landscapes when green open space is limited.

At present, clear design guidelines and specifications for the food forest in urban public spaces are scarce. Schaffer (2016) indicates that current research on green open areas in cities and research on food forests is conducted separately, and indicates that there are more potential synergies, if explored together. Therefore, this thesis will not suggest that urban landscape amenities for the sake of food production should be removed. On the contrary, the **social yields** will be focused on and developed further in this thesis with the aim to attract more people to these spaces by adding public food in urban open spaces and providing additional reasons for people to visit and participate.

The urban food forest is not just a regular urban agriculture place where food is produced by a small portion of the community; instead, it is an attractive urban public space that is open for all urban residents. This thesis will ask the following research question: **What design principles should be used in order to integrate food forests into the urban open space and evoke public participation?** The overall research objective is to strengthen the development of urban food forests for public use through the development of a framework of tools (design guidelines) based on the current theory and knowledge acquired in existent urban food forest sites. This thesis will focus on how to design spaces, facilities, and events to support and encourage public participation and involvement in urban food forests.

Background

Definition of Urban Food Forest:

- Food Forest

Before introducing the concept "urban food forest" in this thesis, the concept "food forest" should be defined first to improve clarity. The food forest, also called "edible forest gardening," is meant to mimic natural ecosystems, intermixed to grow in a succession of layers (Figure 1), with edible plants, a designed community of mutually beneficial plants and animals intended to produce food for human consumption (Jacke & Toensmeier, 2005). The upper level includes fruit and nut trees, the middle level is packed with berry shrubs and vines, while the lower level features herbs and edible perennials.

As a practice of permaculture thought, in which people attempt to design earth-friendly systems that are put in place permanently, and work with little outside interference, the food forest is a low-maintenance sustainable plant-based food source.

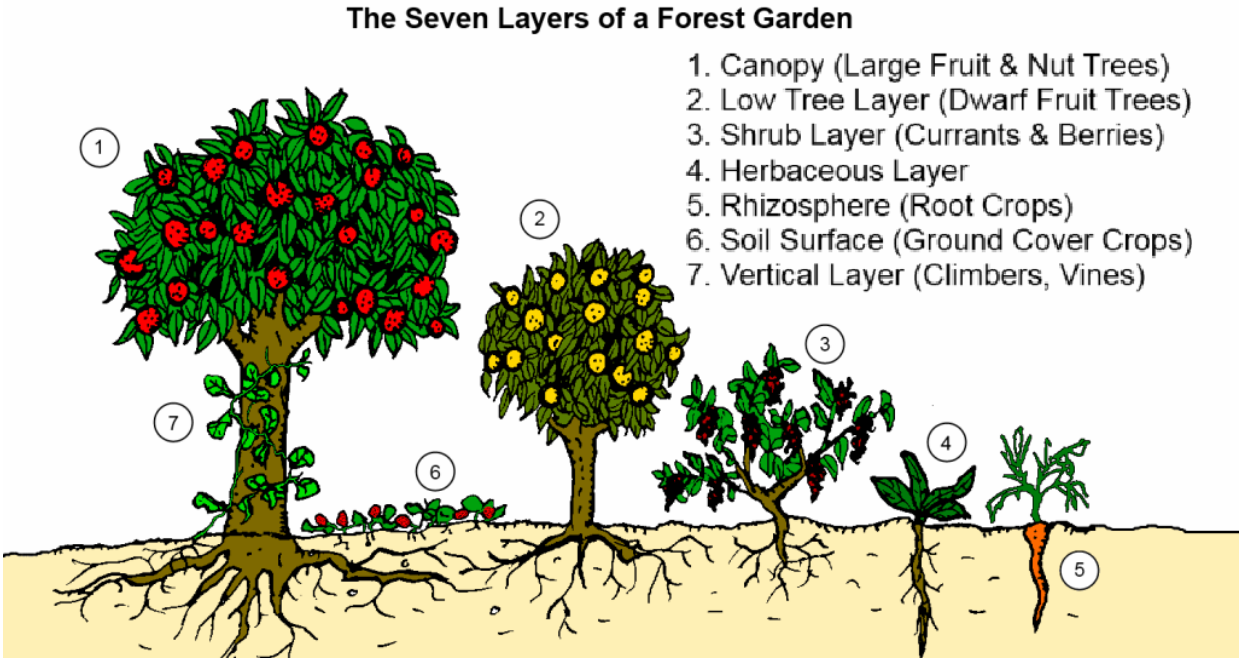


Figure 1. Seven layers of a forest garden, based on permaculture principles. (Graphic from Permaculture a Beginner's Guide, by Graham Burnett).

- Urban Food Forest

Swedish researchers Clark and Nicholas put forward the term Urban Food Forest (UFF) in 2013 based on their research on home gardens, community orchards and perennial urban agriculture. They defined the urban food forest as ''the intentional and strategic use of woody perennial food producing species in urban edible landscapes to improve the sustainability and resilience of urban communities'' (Clark and Nicholas, 2013). They believe that urban food forests should integrate design principles and science from agroforestry, urban agriculture, and urban forestry. Such an approach can improve urban landscape productivity (Clark and Nicholas, 2013).

The definition of urban food forest in this thesis will adopt Clark and Nicholas' viewpoint; it will place **emphasis on perennial woody fruit and nut-producing species planted on an urban open landscape but also with public access available for free harvesting.** It will also cover public orchards (a collection of fruit trees planted in a public space) and other urban fruit tree initiatives.

- Urban Food Forest and Urban Agriculture

The private garden is the most common form of urban agriculture; it is a private food-producing garden located in the front or back yard, rooftop, or balcony of a private family residence, attended by an individual, and end products are typically used for personal consumption (American Planning Association, 2009). Unlike a private garden, the urban food forest involves public and community participation. While it may seem like a derivative product of a community garden or institutional gardens, it differs from these two spaces. A community garden located in a residential area is gardened and managed collectively by a group (American Community Garden Association, 2007). In most community gardens, individual plots are rented by gardeners with a membership fee and gardeners devote the labor to maintaining their own plots. The food products are mainly annual crops. An institutional garden is located on institutional property (school, faith-based organization, workplace), and is gardened by an organization or business used for educational, therapeutic, and community service purposes (APA, 2009). For these two types, the gardening activities and end products are limited to individuals or exclusive groups, such as community residents for plot renters, food related organizations, or student groups in educational institutes. The general public is not involved.

In contrast, urban food forests are mostly funded through grants, and volunteers will handle the labor for site maintenance, and the food products are available to the public (see the explanation diagram in Figure 2). In addition, food produce is not the only main function; these spaces also provide multifunctional space for foraging and community gatherings and activities, and provide social and educational opportunities. However, this does not mean urban food forests are better or worse than any other types of urban agriculture; they all have their values in urban communities.

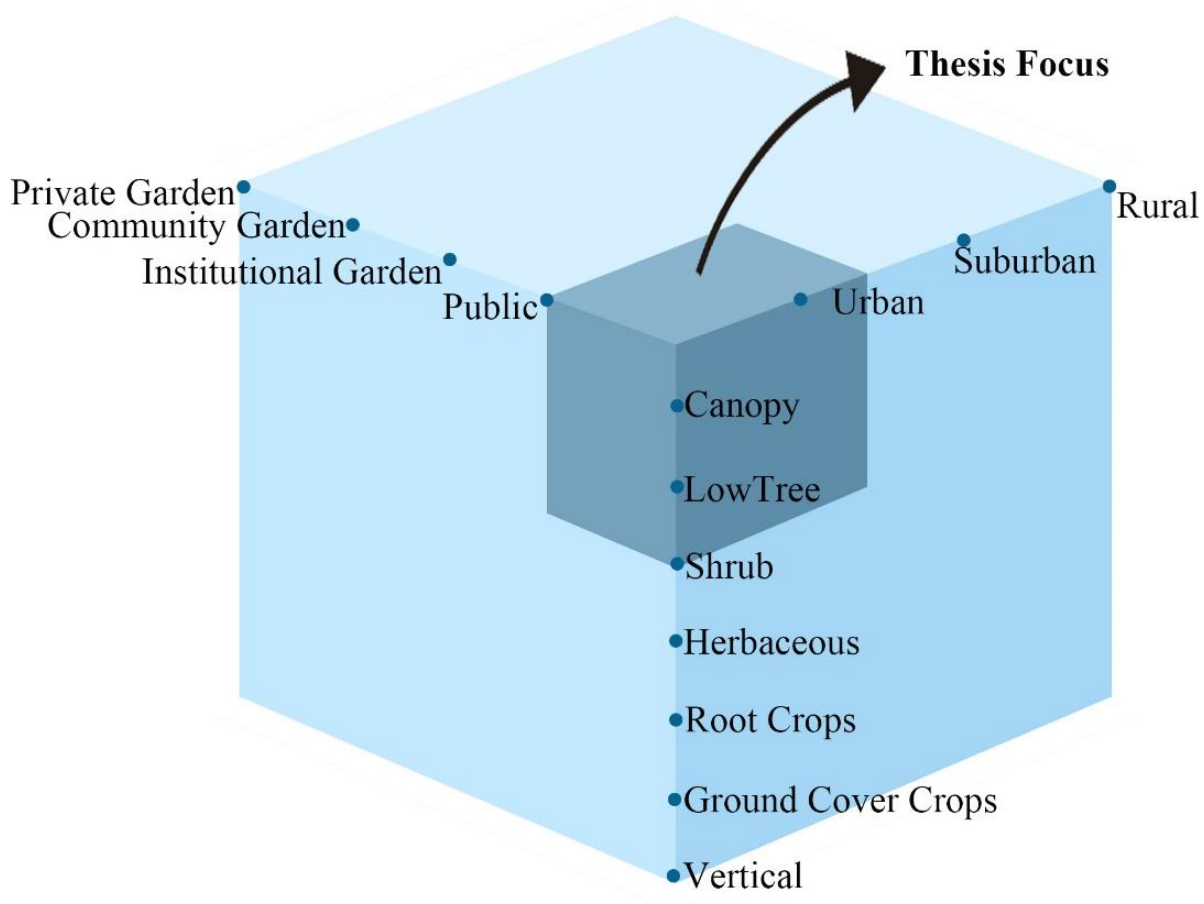


Figure2. Urban Food Forest Definition Focus in This Thesis. (Graphic by Author).

Development of Urban Food Forest in Public Space:

The concept of a food forest is relatively new. It was first popularized by author Robert Hart in his book Forest Gardening: Cultivating an Edible Landscape. He described his decades of experience gardening in the Shropshire (England) countryside modeled on "natural woodlands" in 1980s, and gives the design guidelines of a perennial food-producing garden (Hart, 1996). He recommended the different plants layers—from ground covers to canopy trees—to create a healthy and productive landscape. However, the food forests at that time were mostly private practice for private home gardens, and the concept of an urban orchard as a public food source had not been emphasized.

In 1997, Asheville, NC, became the first city to give permission to a local non-profit organization to establish an urban food forest on under-utilized Parks and Recreation property, and George Washington Carver Edible Park in Asheville, NC, is believed to be the first urban food forest in United States. After about ten years, the urban food forest and the planting of public fruit trees has been gradually taken as an urban planning approach. Similar projects began to sprout up in cities. Initiatives like City Fruit Seattle (founded in 2008), Philadelphia Orchard Project (2007), Boston Area Gleaners (2004), and Portland Fruit Tree Project (2006), have been planting urban orchards or taking on the responsibility of caring for and harvesting fruit from already existing urban trees.

At present, in the Philadelphia Orchard Project, there are 44 orchards that have been planted to provide healthy food, natural beauty and educational opportunities to the community, of which 11 orchards are available to the public for free harvesting, while others are open for certain neighborhoods and groups (POP Website). Fallen Fruit Los Angeles, by producing maps of publicly accessible fruit at several Las Angeles areas (e.g., Fruit Maps at Sherman Oaks, Los

Angeles, Figure 3) and planting fruit trees on public property, provides fresh fruit access and opportunities for people to experience the city as a fruitful place (Fallen Fruit Website).

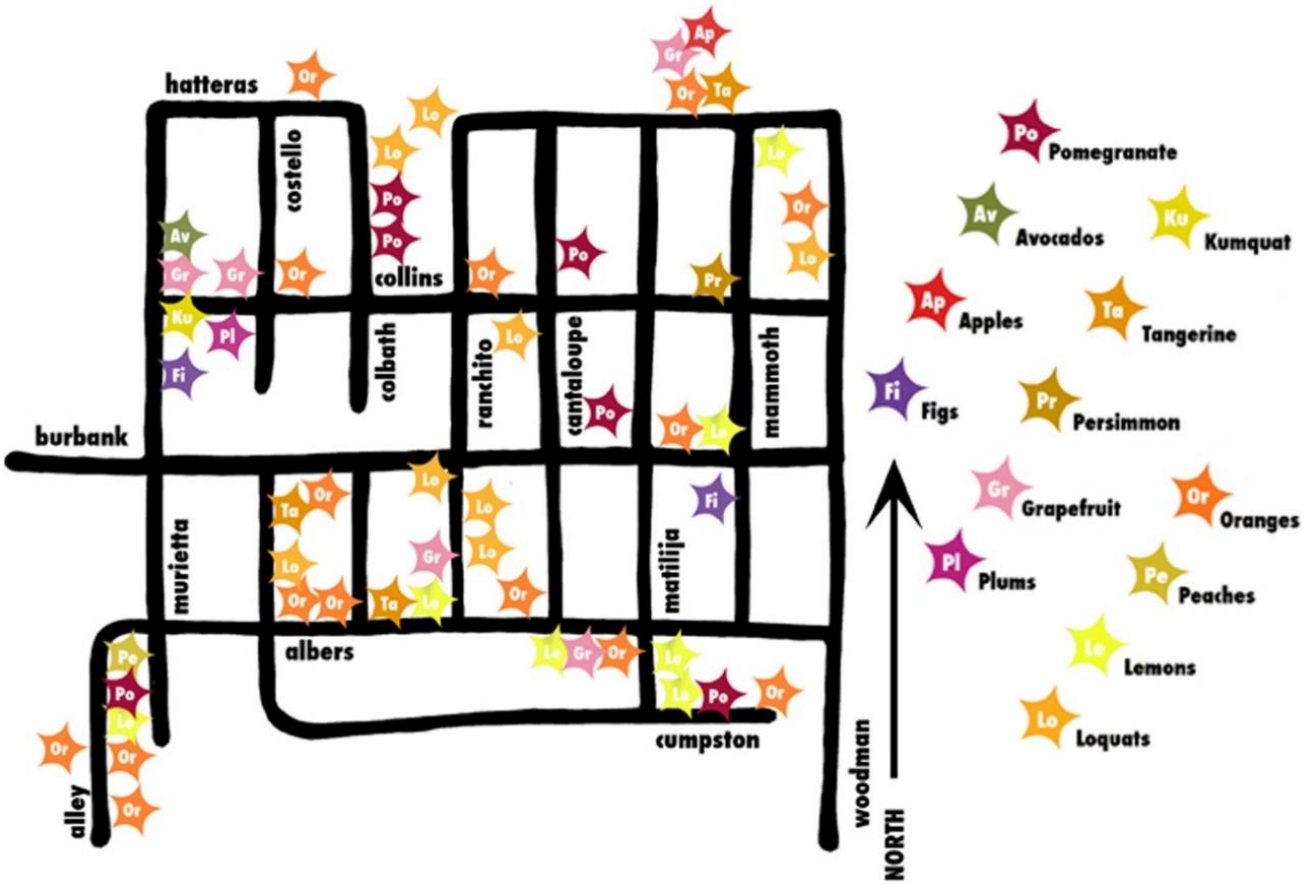


Figure 3. Fruit Maps at Sherman Oaks, Los Angeles. (Graphic by Fallen Fruit Website).

At present, more and more cities have adopted permaculture food forests, urban orchards and fruit trees as public produce, and as of the year 2015, there are over fifty urban food forest initiatives throughout the country (Bukowski, 2016). The food produce is open to the general public, certain community groups or related organizations. Based on Clark and Nicholas' research in 2013, these initiatives can be summarized using four design strategies:

1. large-scale multi-hectare patches like the Beacon Food Forest in Seattle;

2. small solitary features like the Dr. George W. Carver edible park in Asheville, NC;

3. scattered urban food forest networks in neighborhoods like the Philadelphia Orchard Project;

4. urban fruit tree networks such as web-based mapping of urban food plants, like Fallen Fruit Los Angeles.

The management of these 4 categories of urban food forests is quite similar. There are usually a mix of stakeholders (community members, local government agencies, organizations, and universities) who acquire land (vacant lots, parks and recreation districts), establish the site, host activities, and handle the labor and maintenance (Bukowski, 2016). The three main public activities of organizations engaging in urban food forestry are planting, mapping, and harvesting/distribution (Clark and Nicholas 2013).

Except for these cities' attempts to establish urban food forests, in 2016, the guidelines on urban forestry published by Food and Agriculture Organization of United Nations (FAO), also suggested to put forward the policies and laws of food forests in urban forest system to support the development of sustainable, equitable food production in urban areas. The use of public lands such as parks, schools, vacant lots and streets for the production of urban food through the creation of food forests is encouraged, including the use of tree species that produce edible fruits, nuts, syrups, and edible leaves (FAO 2016).

Social Benefits of Urban Food Forest:

Urban food forest as a form of urban agriculture can reach the basic aim for food production, while also providing space for social interaction. The contribution of social yields is as important as the food itself. For this reason, conducting research on how to better encourage public participation is worthwhile.

Urban food forests can meet people's needs for urban food foraging: urban food foraging refers to citizens searching and picking edible plants in the city. Self-foraging has become more and more popular around the world. The commercial U-Pick farm is a good example, and a lot of people enjoy foraging in urban public space for wild food. One research project showed that, in New York, Philadelphia, and Seattle, some foragers lead gathering tours in city green spaces each year, providing dozens to hundreds of people with their first urban foraging experience (McLain, 2014). Some frequent foragers indicate that they have fun with the foraging process and are satisfied eating something they have picked themselves (McLain, 2014). Urban food forests can provide a space in cities and give people an opportunity for free gleaning and foraging.

Urban food forests can create a community/social bond: urban food forest could encourage communities to get involved in outdoor activities and increase the sense of community togetherness, by yielding fresh food and providing a place for people to gather, socialize, and share knowledge and learn from each other. The site could provide opportunities for people to participate in diverse events and programming, such as food sharing, holiday celebration, performance and vending markets (Gorgolewski, Komisar and Nasr 2011). By interacting with other people from different cultures and backgrounds, and this will provide a sense of community cohesion.

Urban food forests can be an educational resource and provide inspiration: urban food forests as productive landscape can provide multiple learning opportunities for people of all ages. People can learn about environmental science, cultural practices, and social interaction (Krasny and Tidball, 2009). In the urban food forest, the plant materials and public produce can provide an opportunity for people to see how fruits and vegetables grow, learn when to harvest, and taste

the foods when they are ripe (Nordahl, 2009). On-site interactive events such as tours and workshops about food, nature, and engineering could educate people about food security, plant species, plant nurseries, ecosystems and construction skills. This will provide vibrant demonstrations and inspiration for visitors.

Design Goals

Research indicates that urban agriculture could be integrated into urban open space system such as urban plazas, parks, trails or community recreation nodes (Philips, 2013), but the primary concern and constraint for urban agriculture planning in the U.S. is competition from other land use. Many residents prefer other uses, such as parks or sports fields, that are oriented more toward cultural functions (Lovell 2010). The argument is that urban agriculture spaces offer a greater benefit to individual residents (the gardeners) than they do to the general public (Hou & Johnson & Lawson 2009). For example, in Toronto, Canada, a proposal to plant an orchard in a local Ben Nobleman Park raised an uproar as some residents feared that the fruit trees would displace the children's play area (Porter, 2009). Thus, this thesis aims to offer multiple functions of food forests, besides just food production, as making every effort to make sure the forests serve the general public is an important mission.

Meanwhile, because of the social benefits as previously stated, research on public participation should also be emphasized. In a recent research effort on urban food forest in the UK, Permaculture Association began a 10-year forest garden trial in 2009, publishing a baseline survey of 117 private or public food forests in Europe and the US in 2013 (Remiarz, 2013, 2014). In the reports, they mentioned that social yields like learning and people's involvement might be as important as what is actually harvested. However, they found that the lack of volunteer and

community engagement is a big weakness for public forests, and it will be challenging to make them more attractive.

In conclusion, the design goals in this thesis are as follows:

1. To integrate urban food forests into the urban area so that they can function as a successful urban public space.

2. To create spaces and facilities to support food related activity so that food is an additional attraction.

3. To encourage and improve public participation in urban food forests (in addition to planting and harvesting food produce).

Methodology and Scope

Methodology: The overall methodology for this thesis will be literature review, case studies and an example project design. This thesis will first utilize the existing design and planning theory of successful urban public spaces, and incorporate current concerns and viewpoints on urban productive landscapes and urban food forests to summarize a series of points/aspects in the final urban food forest design guidelines. Then these points/aspects will be observed in case studies. Three main case studies—Beacon Food Forest, Wetherby Edible Forest, and Swale Floating Food Forest—will be analyzed systematically and discussed. A few additional cases will be studied, in part to come up with a detailed design guideline for the urban food forest. Lastly, the design guidelines will be applied to a design for the Athens City Hall Plaza (Figure 4).

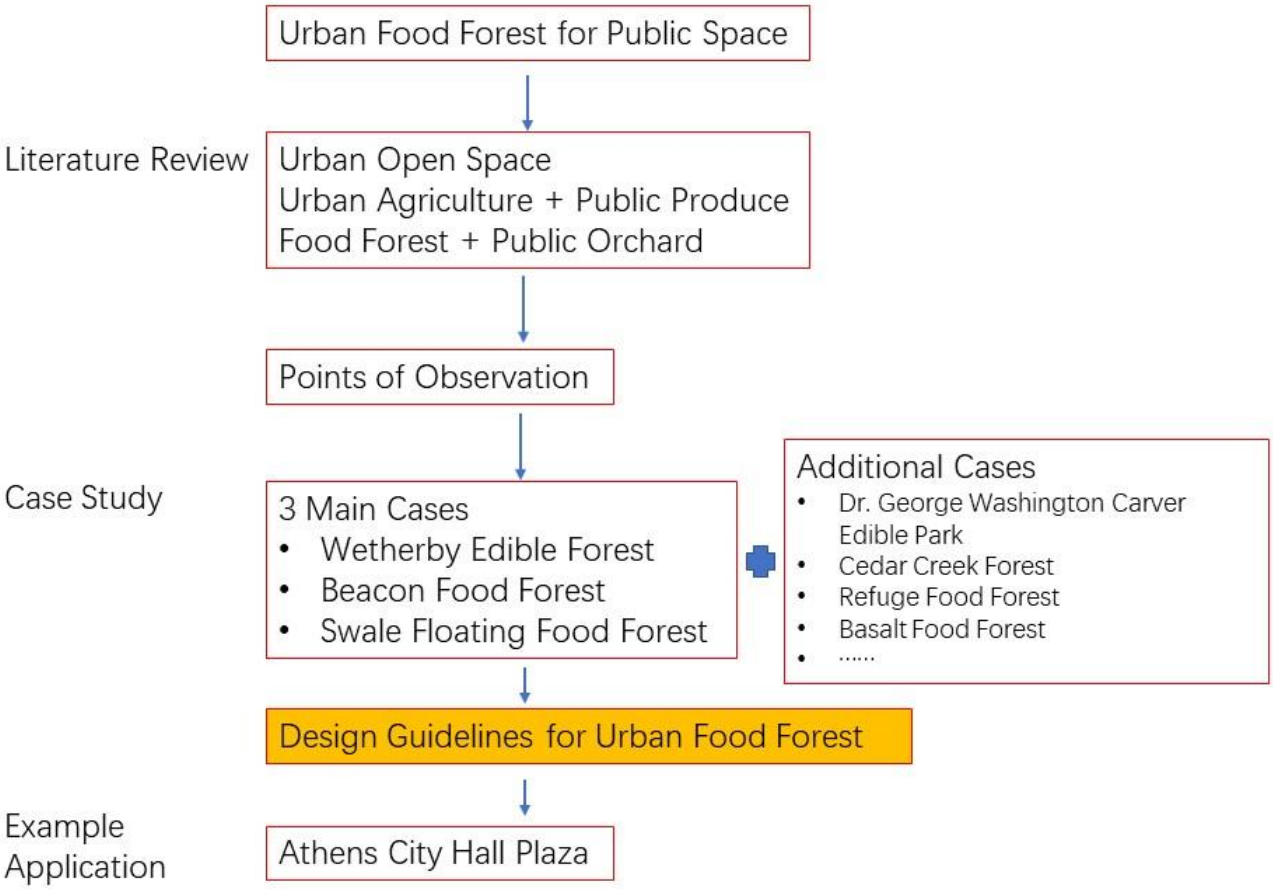


Figure 4. Thesis Methodology. (Graphic by Author).

Scope: In this thesis the guidelines will focus on the social yields of urban food forests to improve public participation, so the design to achieve other benefits such as planting material arrangement, environmental preservation, economic development, and maximum yields for helping urban food desert will not be discussed. In addition, although there are four types of urban food forest design strategies as previously listed, this thesis will not give the design guidelines for type 4, which is mainly web based and on a large urban scale, because the design guidelines in this thesis are mainly for small sites.

CHAPTER 2

DESIGN APPROACHES IN LITERATURE

The previous chapter discussed the definition of an urban food forest and its development. The potential social values of creating food forests as urban open spaces and the research gap of designing urban food forests for the public were discussed. This chapter aims to determine what should be considered when creating design guidelines for public urban food forests. In particular what points/aspects are important that need to be contained in the guidelines. Based on the existing literature on successful urban public space design strategies, and current concerns and viewpoints on urban productive landscapes and urban food forests, a determination of points/aspects for urban food forest design guidelines will be made. These points/aspects will be observed and case studies will be used to find solutions in the next chapter.

General Design Guidelines for Successful Urban Public Space

Open space encompasses a variety of spaces within the urban environment with open access to the public. They can include green space, parks, playgrounds, public seating areas, public plazas, streetscapes as linear open space and vacant lots. In contemporary urban open space design, one of the most important researchers and practitioners was William Whyte, who published *The Social Life of Small Urban Spaces* in 1980 based on his research on human behavior in urban public spaces. The *Project for Public Spaces* (PPS) was founded in 1975 and is also based on the work of William Whyte. It is a nonprofit organization dedicated to helping people create and sustain public spaces that build stronger communities. Another collection of

design guidelines, *People Places: Design Guidelines for Urban Open Space*, created by Carolyn Francis and Clare Cooper Marcus, translated research findings about human behavior and social activities in urban public spaces into practical design guidelines. Common topics discussed in these sources are as follows: site selection, access, circulation, boundaries, users and activities, programming, plant materials and natural settings, safety, and maintenance. More detailed information will be discussed in the later "Points of Urban Food Forest Design Guidelines" section.

Concerns of Public Productive Landscape and Urban Food Forest

With the growing interest in food and productive landscapes in urban areas, the research of public produce and urban food forest design guidelines is still in early development. However, the research of general urban agriculture is well developed. Lawson (2005), Philips (2013), Gorgolewski, Komisar and Nasr (2011) have provided planning and design strategies for urban agriculture sites and identified the potential of urban agriculture landscape systems to not only solve the food security problem, but also to provide a space for recreation, leisure and public art; providing activities that benefit the city and community. Even though the research scale for urban agriculture landscapes is much broader than public produce and urban food forests (because some urban agriculture sites are not open to the public, or even on public land; and the food produce belongs to individuals or certain organizations, and is not for the public to freely harvest), there are still some valuable points of view that could be used as references.

Public production of food raises several concerns. Nordahl (2009) stated some concerns from citizens and governments about public food produce in urban open space, such as maintenance and aesthetic problems, and the awareness of public harvest. In addition, a research

project done by the Heart Foundation (2011) about productive trees in urban streets and public spaces also highlighted public concerns such as management of produce, site maintenance and public liability risk (along with some corresponding solutions). In addition, Jacke and Toensmeier (2005), published design guidelines for forest gardens and food forests. Although they focus on design strategies from the horticulture perspective, they also put forward guidelines about site access and elements from the landscape architecture perspective such as the design of plantings, pathways, nodes, and outdoor rooms. More detailed information will be discussed in the next section.

Points/Aspects of Urban Food Forest Design Guidelines

This section will demonstrate the literature in detail for urban public space design strategies, and current concerns and viewpoints on urban productive landscapes and urban food forests. However, the design strategies for urban public spaces are very broad, and not all topics are important in regard to an urban food forest. Based on the unique features of public productive landscapes and urban food forests, only the most relevant topics will be stated. In addition, according to the three design goals listed in Chapter 1, the literature review for points/aspects in urban food forest design guidelines will be classified into three categories: basic facility, attractive amenity and event and programming (Figure 5).

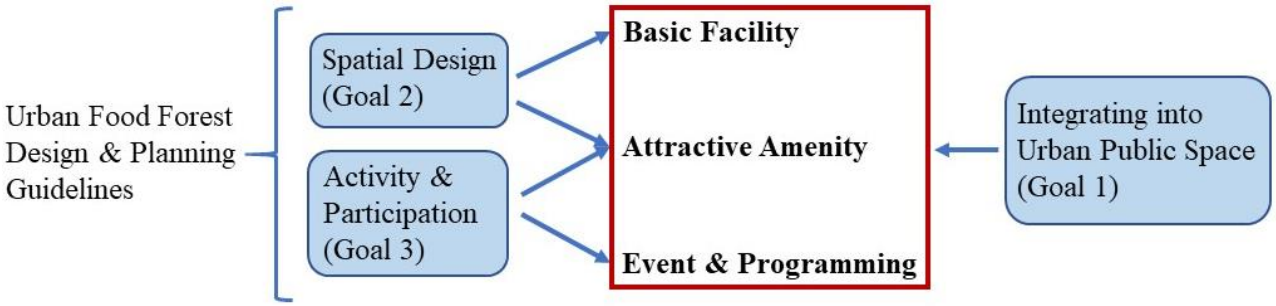


Figure 5. Structure of Urban Food Forest Design Guidelines. (Graphic by Author).

1. Basic Facility

In urban public space, access to the site is the basic requirement for allowing people to utilize it. A public space should first clearly convey the message that the place is available for use to the public (Francis & Marcus, 1998) and have good visual and physical connections with its surroundings. Accessible entrances and paths should be provided (Project for Public Spaces, n.d.) and boundaries or entrances should be open to adjacent main roads and sidewalks, so passersby will feel as if they are invited inside (Francis & Marcus, 1998). An urban agriculture site should also physically build connections with the urban infrastructure, such as roads and paths that link food landscapes to other urban amenities including other food landscapes, open spaces and other activity functions (Philips, 2013). Besides serving as attractions and providing visitors with accessibility, connections could also support food production needs such as volunteer or employee accessibility, surplus food storage, and distribution (Philips, 2013).

Apart from outside accessibility to the site, the ability to access the edible is also important. Some urban food forests are very dense, with extremely cramped spaces, a wet and messy ground, and unclear or narrow pathways. If people cannot enter into the site, it leads to an abundance of inaccessible edible plants that will be ignored and abandoned by the public. According to Jacke and Toensmeier (2005), poorly sized pathways could impede enjoyable work and play conditions in the food forest; clearly demarcated pathways and circulation will tell visitors where to walk, which will maintain healthy soil and protect the plants. In addition, for public produce, although free food is physically accessible, many people are unaware they can harvest it due to a lack of understanding about which part of the plants are edible, when to harvest, and whether public food is safe, clean, and legal to eat (Nordahl, 2009). These elements prevent some people from wanting to access the edible plants. Nordahl (2014) suggested a

simple solution: food should be prominently displayed in the landscape, reminding people of their food choices, and inviting them to harvest. Even signage, that is well designed and conspicuously placed will encourage public harvest and reduce food neglect or waste.

As urban public spaces, sites should also be easy to clean and care for; even the best design can be ruined without regular maintenance (Francis & Marcus, 1998). An objection to planting food-bearing plants in public spaces is maintenance (Nordahl, 2009; Grow Your Park, 2015). Food may fall onto the ground and decompose, leading to the perception of poor maintenance. The site's maintenance should be highly valued in an edible landscape and urban food forest. In terms of plant materials, food-bearing plants may need more care than normal ornamental trees, such as pest control, pruning and watering. In order to minimize the workload for plant care, the selection of tree species is very important. The plants in the urban food forest should meet two requirements: the plants should grow well in the local area, and their growth should require minimum care and maintenance (Dave, 2005). However, plant selection requires horticulture and agriculture knowledge. This part is beyond the scope of this thesis, so the guidelines for plant species selection in the low maintenance perspective will not be discussed further.

2. Attractive Amenity

People are the soul of an urban public space, and high usage will give the space more vitality. Activities are fundamental to the development of a public space for public use, and the more activities that are going on, the more opportunities people will have to participate (Project for Public Spaces, n.d.). It has been suggested than an urban agriculture site should be designed to engage a broader range of public participation (Lawson, 2005), combining food production with complimentary uses to incorporate multi-compatible activities such as recreation, leisure and

retail opportunities (Dubbeling, 2011; Philips, 2013). In order to attract events, the site should be furnished to support the most likely and desirable activities. Facilities and amenities are needed that appeal to different users (Francis & Marcus, 1998).

In urban food forests, compared with normal open spaces, food is the extra attraction; thus, how to grow food to meet people's needs should be discussed. Moreover, site design should support essential urban activities or food related activities, such as spaces and seating areas to support both group meetings and individual relaxation (Whyte, 1980). Appropriate site elements such as storage and message boards for food planting and harvesting activities also add to the effectiveness of the design (Milburn & Vail, 2010). The potential to use food forests as an outdoor education and demonstration area is considerable (Gorgolewski, Komisar and Nasr, 2011; Philips, 2013); therefore, the design of the facilities should consider how to achieve this educational goal. In addition, for urban public spaces, there are other elements that can increase public interest, such as public art, playgrounds, vending, and lively edges (Francis & Marcus, 1998). These elements will also be observed in case studies to check whether they are installed and could work well in urban forest site.

3. Event and Programming

As stated, activities are the essence of a place. Site facilities and amenities, events and programming could also bring people into the site and attract public participation (Francis & Marcus, 1998). For urban productive landscapes, as multi-use is encouraged, both gardening and non-gardening programs could be held on the productive landscapes (Lawson, 2005; Hou, Johnson & Lawson, 2009).

Site maintenance is an important consideration for food forests as discussed before. The planting, harvesting, and maintenance of edible plants are the unique features that differentiate a productive landscape and urban food forest from a normal urban open green space. These activities require a lot of labor, and volunteers could take an important role in that. At in the same time, fun volunteer work days can bring the community together. Public food is a unique attraction in the urban food forest, and also is good for site publicity. Eating and enjoyment of food on site can be set up as feasts and celebrations held for communities and citizens (Philips, 2013). Food related art events can provide a vivid way to emphasis food themes, and non-food related art events are also a good way to attract people. Information about food landscapes could provide benefits to the community and city (Philips, 2013). Events could be open to the general public or managers could work with school programs to create outdoor classrooms. In this thesis, just on-site education events will be focused on; off-site training and mentoring of students, community members, and staff will not be discussed.

Conclusions

In conclusion, the following three categories can be subdivided into eleven points that can be used for urban food forest guidelines framework as shown below:

Basic Facility:

1. Access to Site:

Physically make it easy for visitors to get into the site.

Visually convey the message that public produce is available for free pick on site.

2. On Site Access to Food:

Physically connect visitors with food and make food easy to find and access.

Visually inform people what is edible and encourage harvesting.

3. Site Maintenance:

Design for reduced maintenance requirements.

Attractive Amenity:

4. Food Attraction:

Create a good harvesting and eating experience.

5. Activity Support Hardscape:

What facilities and site furniture can be used to support basic essential activities such as group events and individual enjoying eating, sitting, or relaxing?

6. Education:

How does the site provide educational opportunities about food and nature (without educational events)?

7. Other Elements of Interest:

What other site elements (such as playground and public art) could be considered to make the urban food forest area more attractive?

Event & Programming

8. Volunteer Work:

What kind of volunteer work events could be held to improve the site at the same time be fun and attractive?

9. Food:

Celebrate food production on site.

10. Art:

What food related or non-food related art events could be held on site?

11. Education:

What events could be held for public education and what topics might be interesting?

CHAPTER 3

CASE STUDIES AND DESIGN GUIDELINES

This chapter presents three main case studies of urban food forests; ten additional cases will also be studied in part to come up with the final detailed design guidelines. The selected sites demonstrate a variety of urban food forest design strategies that were mentioned in Chapter One. Beacon Food Forest is type 1 (large scale multi-hectare patches), and Wetherby Edible Forest and Swale Floating Food Forest belong to type 2 (small solitary features). The design guidelines are thus most suited for these two types. In addition, when design individual sites for type 3 (initiative scattered urban food forests networks) are required, the design guidelines can also be used. As formerly stated in the research scope, the type 4 (urban fruit tree networks) will not be covered. The site sizes for the three main case studies varied from 7 acres to 0.1 acres, but the locations are similar. Even though they are not located in urban downtown core areas, they are all located beside city parks that are close to dense neighborhoods, which ensures the possibility of site visits and participation from residents.

For each of the main three cases, the following basic information will be given: site name, location, size, and site background information. Then, an analysis will systematically follow the design guidelines framework that was demonstrated in Chapter 2. The ten additional cases will not be systematically analyzed, but will provide additional graphics and unique features in the urban food forest design guidelines section.

Three Main Case Studies

Wetherby Park Edible Forest

Location: Wetherby Park, Iowa City, Iowa.

Size: 1/3 Acres

The Wetherby Park Edible Forest (Figure 6) is located in Wetherby Park, a city park that serves neighborhoods surrounding the southeastern end of Iowa City. These are predominantly low-income and multi-ethnic neighborhoods. Established in 2011 as a project of Iowa City Parks and Recreation, and in partnership with Backyard Abundance (an Iowa City-based nonprofit that helps people create environmentally-beneficial landscapes), this edible forest is a low-maintenance area, with organic fruit trees, berry bushes, herbs, and other edibles (Backyard Abundance, n.d.). The site received grants from the National Parks and Recreation Association aimed to help people learn to grow high-value orchard crops and enhance the competitiveness of these crops in Iowa (Backyard Abundance, n.d.).

According to the Wetherby Park Edible Forest's website, the goal of this place is "to bring the richly diverse community together by fostering an ecological-based approach to urban farming and land stewardship." This site is designed for large harvests and fun gatherings (Figure 7).

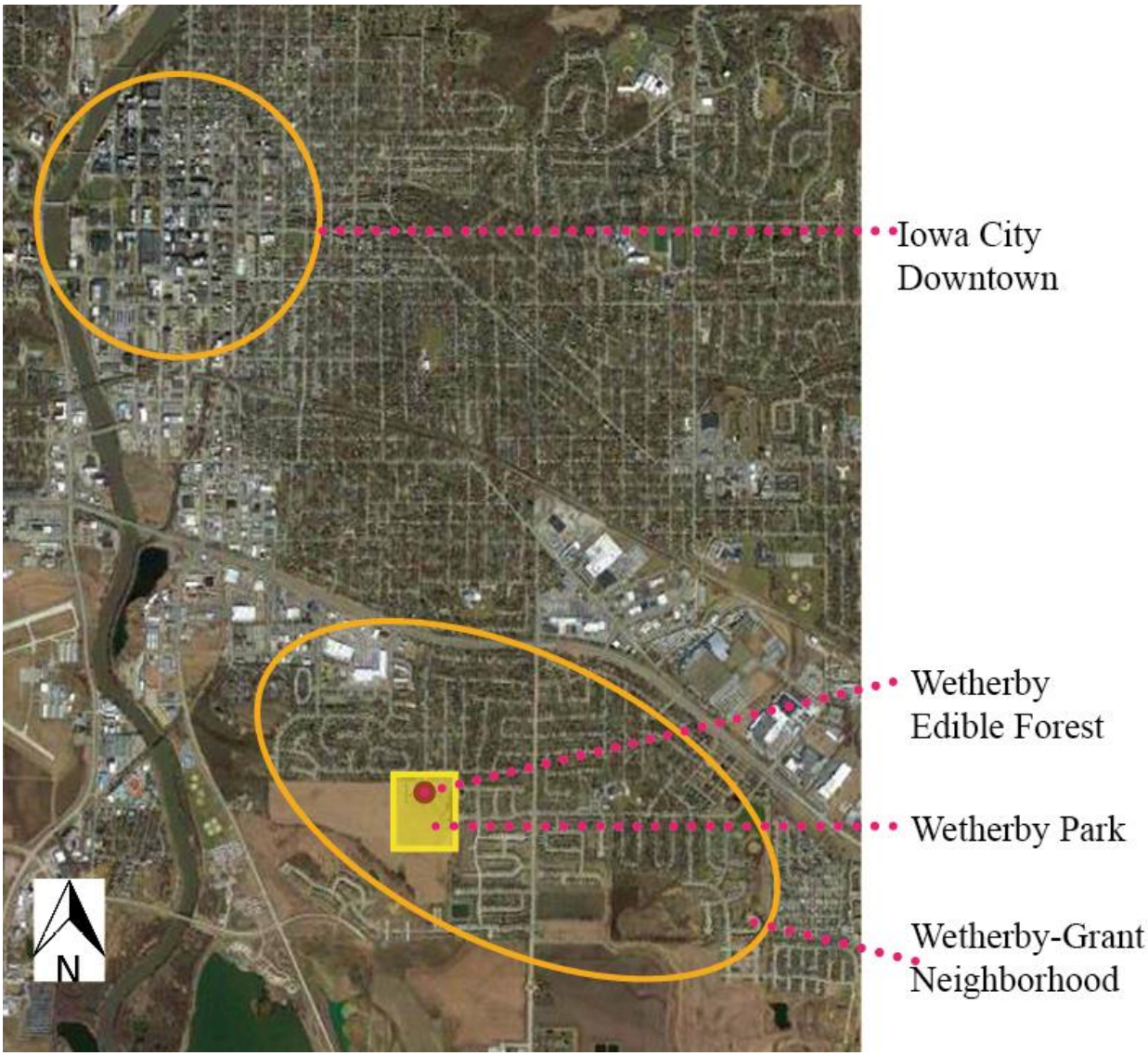


Figure 6. Wetherby Edible Forest Site Location. (Graphic by Author).

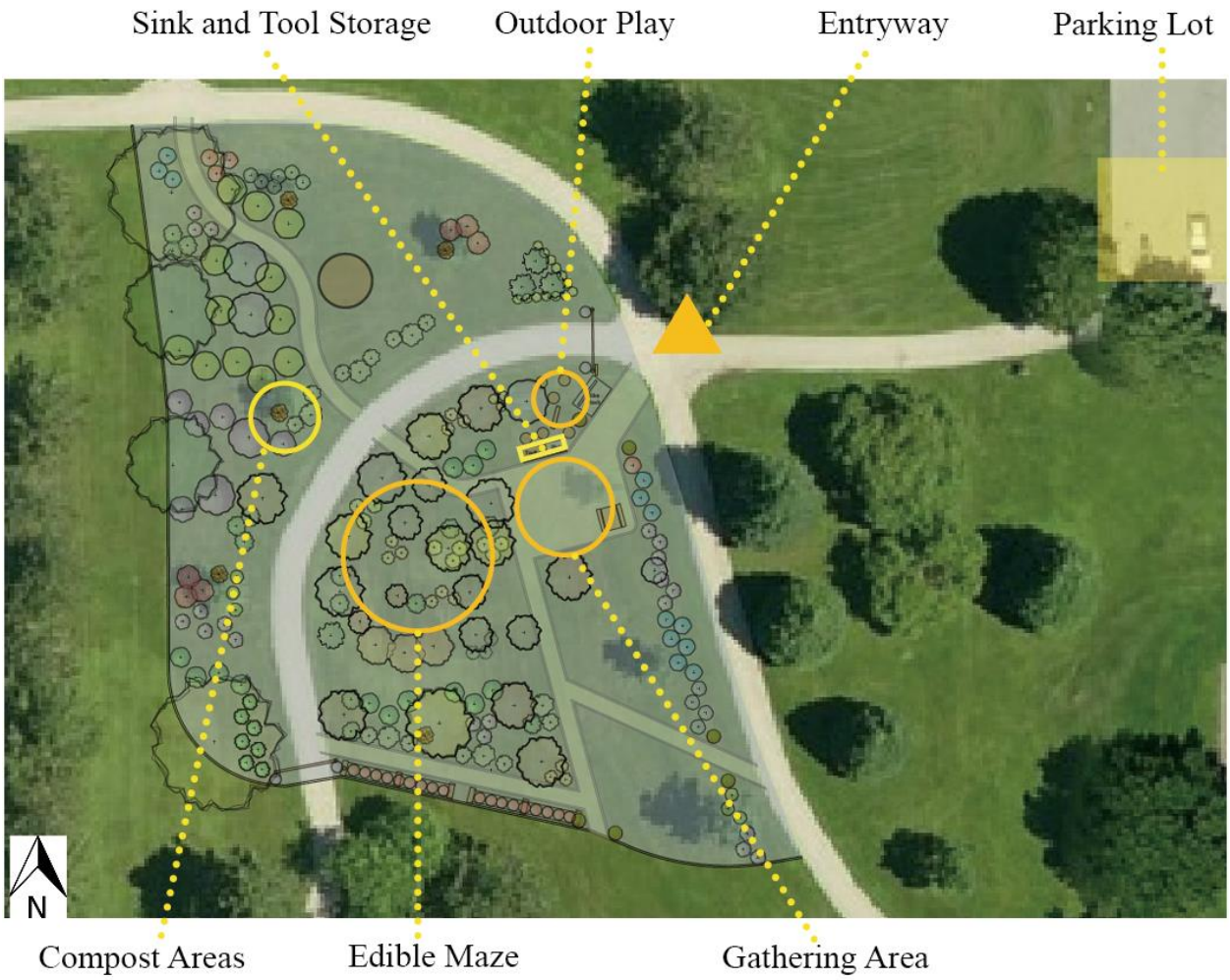


Figure 7. Wetherby Edible Forest Site Context Map. (Graphic from Backyard Abundance Website).

- Basic Facility:

Access to Site: This edible forest is located on the north side of Wetherby Park, two miles from downtown Iowa City, in the west side of the Wetherby-Grant neighborhood, and it is open at all times to visitors. A nearby parking lot is available for visitors (Figure 7). Building on the existing Wetherby Park pedestrian park ways, the entrance and inside circulation in this edible forest is connected with urban city infrastructure; thus, it is very convenient for people to gain

access. However, there is no gateway signage on the edge of this edible forest, so the visual availability of edible plants and fruits is not clearly communicated to communities and passersby.

On Site Access to Food: The pathways and circulation on the site are very clear (Figure 8). The first level pathway is the original park road, and it connects with the urban context; the second and the third level pathways are newly designed. The second level pathway is defined by the white edge (Figure 9), and connected to the main nodes of this edible forest with first level pathways; and the third level pathway is built with step stones throughout the site to ensure access for food foraging.

Figure 8. In-Site Pathway System. (Graphic from Backyard Abundance Website).

Figure 9. Second Level Pathway. (Graphic from Backyard Abundance Facebook).

Small plant identification signs (Figure 10) have been installed beside plant materials throughout the edible forest to provide information about each plant and its harvest period, and to help visitors to identity species while harvesting food; also, the signs serve an educational function. In addition, there is an online website (Plants Map) that provides additional information about each plant. People with smartphones can scan a QR code on each sign for detailed information about the given plant.

Figure 10. Plant Identification Sign. (Graphic from Backyard Abundance Facebook).

Maintenance: A water infiltration swale has been established for runoff management. A compost area has been installed to deal with weeds and waste food.

- Attractive Amenity:

Food: There are a variety of edible plant materials and multiple plant layers in this site. There are currently about 15 species of trees and shrubs and 10 species of herbs. The main growing season is April to August. According to Fred Meyer, it is estimated that about least 3-5 families harvest crops from the area each week during the growing season.

Activities Support Hardscape: A gathering plaza is located at the center of the edible forest as well as near the entrance, with convenient access. The site is used by the locals as a socializing space and as an event venue. In addition, a shaded area provided by canopy trees beside the site can provide space for family picnics, presentations, food processing, and relaxation. A table and bench are also located near the gathering plaza for holding events and for seating. In addition, near the gathering plaza is a sink installed for washing produce. A tool storage box installed beside the open gathering space is used as a seating area or performance platform when holding public events (Figure 11).

Figure 11. Tool Storage Box. (Graphic from Backyard Abundance Facebook).

Education: as formerly stated, the food-finding signs could function as educational signs to provide plant knowledge, to increase public awareness of how these plants grow, appear and taste. A butterfly garden with flowers is proposed on the Master Plan, but has not been built yet. The aim is for the garden to serve as a play and educational space for children.

Other Elements of Interests: The central theme and highlight of the Wetherby Edible Forest is the edible maze (Figure 12). It was the first thing installed in this edible forest, and is near the gathering plaza (Figure 7). The edible maze provides people with a clear and inviting path that leads to edible plants. People can meander through the maze picking fruit and herbs throughout the growing season. According to Fred Meyer (Co-Director of Backyard Abundance), kids play in the space just about every day during the growing season (Fred Meyer, Email message to author, January 20, 2017). Even though some of them don't always know and care about what can be harvested—it's a fun place to experience nature. Furthermore, for children's outdoor play, there is a playground beside the gathering plaza with buried stumps, logs and boulders that gives children a place to play and improve their balance skills.

Figure 12. Edible Maze. (Graphic from Backyard Abundance Facebook).

- Event and Programming:

Volunteer: workday volunteers help with the site construction and maintenance, such as pruning Fruit trees, establishing a monarch garden, and holding planting events. During these activities, volunteers help to build the pathways, apply mulch on planting area, plant trees and shrubs, and prune fruit trees.

Food and Harvesting: In order to encourage public harvesting, two or three "Smoothie and Harvest Parties" (Figure 13. A & 13. B) are hosted during the growing season to help ensure that none of the food goes to waste. People from the surrounding neighborhood get together to celebrate the food and harvest season.


Figure 13.A, 13.B. Smoothie and Harvest Party (Graphic from Backyard Abundance Facebook).

Educational Events: The site serves as an outdoor classroom and children's play space where frequent educational events are held. "Planting Parties" teach families how to establish low-maintenance edibles. Propagation classes teach people how to sustainably take cuttings and seeds from plants to establish them in their own yards. Celebratory events demonstrate how to harvest, cook, and store produce (Grow Your Park, 2015).

Beacon Food Forest (BFF)

Location: Jefferson Park, Seattle, Washington.

Size: 7 acres total. In 2013, Phase one (1.75 acres) was completed, and construction began on phase two (1.75 acres) in 2017.

Beacon Food Forest (BFF) is the first large-scale public food forest in America. The design of this seven-acre site provides opportunities for cultural exchange and understanding, education, and recreation. It was established in 2009 as a result of a permaculture design course final project, and aimed to design an urban food forest that allows the community to gather together, grow its own food, rehabilitate its local ecosystem, as well as provide educational opportunities (UFF Final Report).

Beacon Food Forest is located in Beacon Hill, a richly diverse community, and one of the goals of the Beacon Food Forest is to bring the Beacon Hill neighborhood together in fostering a permaculture site for urban farming and land stewardship. Another goal is to provide healthy affordable food to the surrounding community. According to the Beacon Food Forest website: "The design of this seven-acre site provides opportunities for cultural exchange and understanding, for education and recreation."

- Basic Facility:

Access to Site:

Beacon Food Forest is located in the Beacon Hill neighborhood on the west side of Jefferson Park (Figure 14), 2.5 miles from downtown Seattle, with #50, 60, 107 city bus access, and a parking lot on the east side (Figure 15). In addition, an ample bike rack is permanently

installed. The site is open all the time to visitors. The surrounding neighborhood—the Beacon Hill community— is located nearby, within walking distance to the site. According to Glenn Herlihy, visitors mainly walk and bike in BFF; the bus station is also well used. The parking lot is mainly for Parks Department employees, but others use it, especially when they need to bring materials. In addition, the site is built on existing pedestrian corridors, and is connected with the urban context for easy to access.

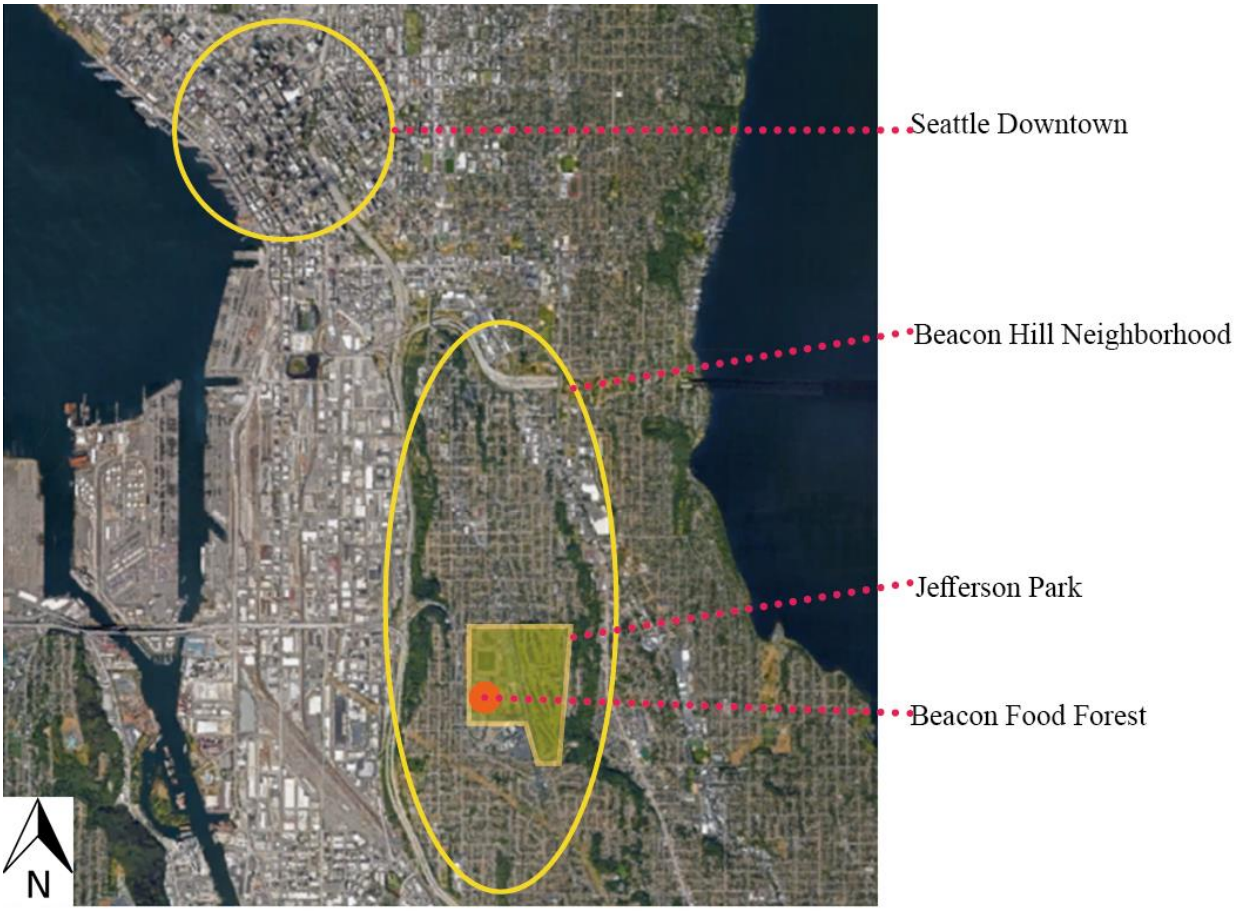


Figure 14. Beacon Food Forest Site Location. (Graphic by Author).

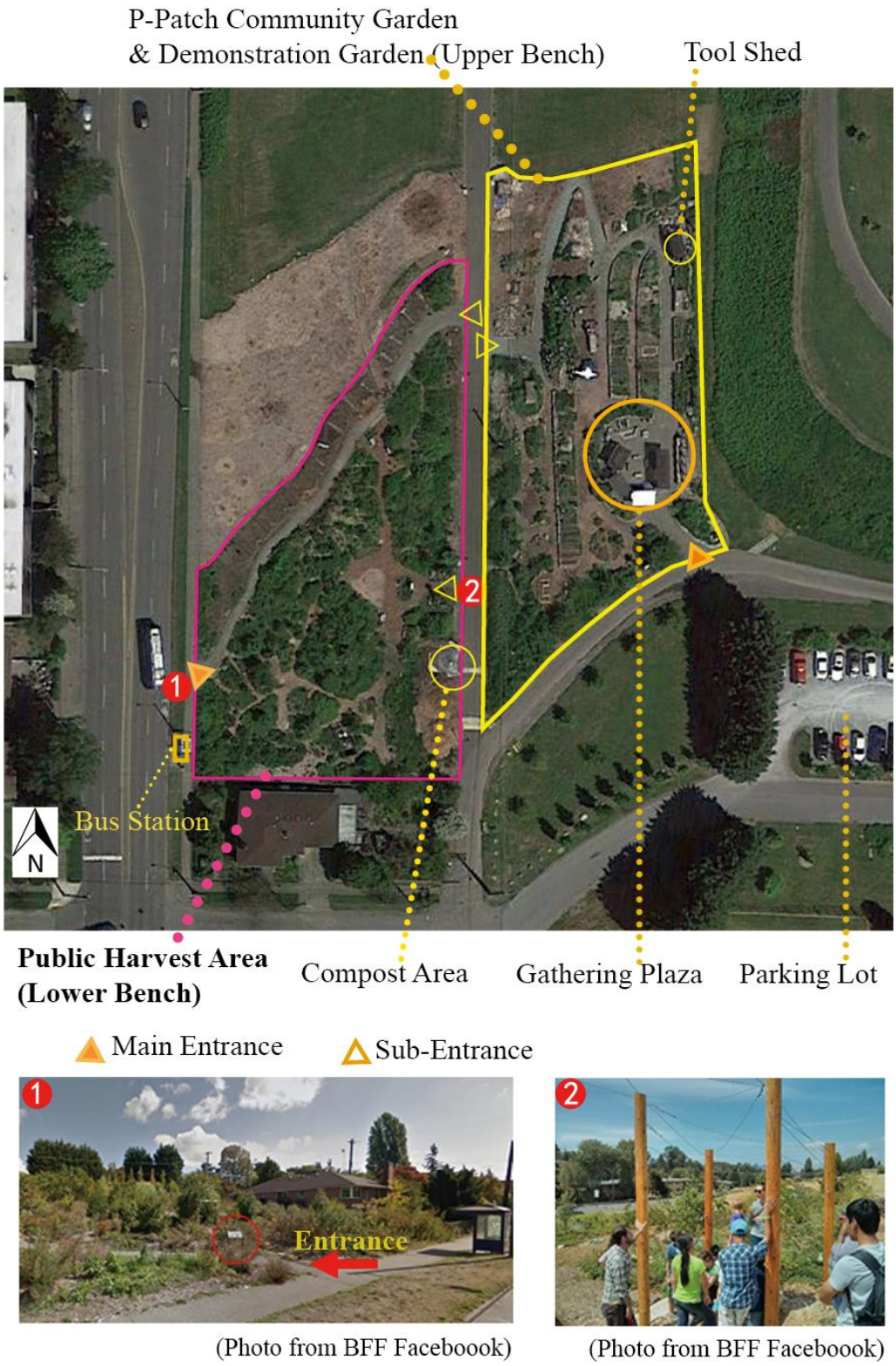


Figure 15. Beacon Food Forest Site Context Map. (Graphic by Author).

Entrance gateway markers: kiwi trellises that are made of logs were installed at the east side entrance of the public harvest area (see No.2 in Figure 15); they are visually very obvious but do not deliver the message of public free food to visitors. On the west side entrance near the bus station (see No.1 in Figure 15), a sign provides information about the urban food forest, but is not visually obvious.

On Site Access to Food: Beacon Food Forest is a mixed-use site; the good thing is the public food harvest area has a very clear zone. The P-Patch on the east side of phase one, also called "upper bench," is a city-wide community garden project in Seattle. The food in this area is for private individuals who rent plots (27 plots total); on the west side of phase one is the public food forest, which is also called the "lower bench"; the food production there is free for the public (Figure 15).

The overall color-coded harvest map (Figure 16) that is provided at the gathering plaza is also very useful. It shows visitors where to find food that is for the public—red indicates that the food is not for the public, while green indicates that the food is for the public. Furthermore, information about how to harvest is clearly demonstrated on the map to inform people that they should pick gently with two hands and leave some for others. In the field, when the fruit is ripe, temporary green stakes (Figure 17) are installed beside the plants to help visitors find mature fruit and encourage them to forage.

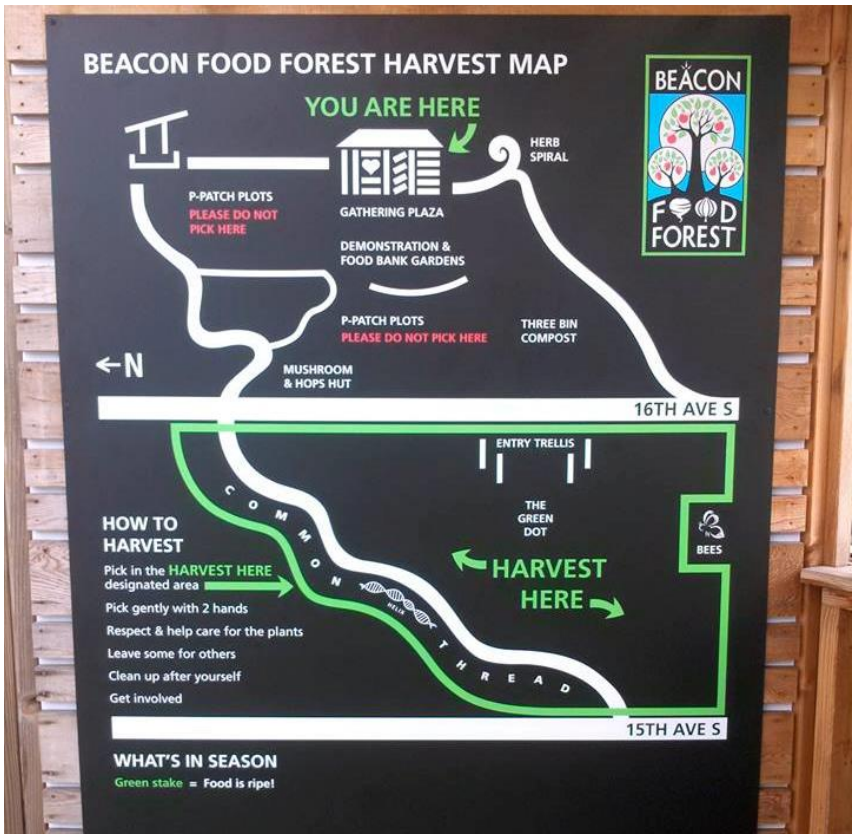


Figure 16. Overall Harvest Map. (Photo from Beacon Food Forest Facebook).

Figure 17. Temporary Harvest Green Stakes. (Photo from Beacon Food Forest Facebook).

The pathway system on the public harvest area is also clear (Figure 18). The main paths are paved with gravel, and there are small pathways in the food forest area that are covered with woodchips (Figure 19), separate the planting area into several small patches and providing a clean and clear circulation that gives people access to the fruit plants.

Figure 18. Public Harvest Area Map. (Graphic from BFF Website).

Figure 19. Pathways in Public Harvest Area. (Photo from BFF Facebook).

Maintenance: a compost site, where waste food is disposed of, was installed to support site maintenance and provide compost.

- Attractive Amenity:

Food: According to Glenn, the main fruit season runs from June to September, with July and August being the most productive; however, food can be found all year round. The garden contains 420 different species of edibles, some of which are native to Seattle, like raspberries, huckleberries and walnuts. Others are a reflection of the ethnicity of the surrounding communities, which include Chinese, Vietnamese, Somalians, Latinos and African Americans, like Chinese pepper trees, persimmons and figs. Everything grown at Beacon Forest is free to anyone and everyone who wants to pick it at any time (Shepelavy, 2017).

Activity Support Hardscape: Beacon Food Forest hosts several events, and its gathering plaza plays an important role. Preparation is always done before the food picnic or music festival. Shelters and benches (Figure 20) were built beside the plaza, and site information also is

provided in this plaza, such as a harvest map and a chalkboard (Figure 21) for workday assignment tasks. A storage room was installed to store tools that volunteers can use on their work days. A kitchen was installed in 2015; a countertop for washing vegetables and plenty of space for preparation were also installed. Students from the University of Washington's School of Architecture built a series of covered areas and tool sheds that are now in place.

Figure 20. Shelters and Benches. (Photo from BFF Facebook).

Figure 21. Chalkboard. (Photo from BFF Facebook).

Education: Interpretive signage (Figure 22) explains the forest system to visitors, the function of the food forest, and information about Beacon Food Forest. In addition, handmade small plant identification signs (Figure 23) installed beside plants show the species names, helping visitors to learn to identify plant materials while harvesting food. The open-air classroom areas will be added in the later phase for educational events (2016 BFF report).

Figure 22. A, 22. B. Educational Interpretive Signage. (Photo form Facebook).

Figure 23. Plant Identification Sign. (Photo form Facebook).

Other Elements of Interest: The Food Forest is set to include an Edible Arboretum with fruits gathered from regions around the world. It will contain a Berry Patch, a Nut Grove with trees providing shade and sustenance, a Community Garden using the p-patch model for families

to grow their own food, and a Kid's Area for education and play (BFF Website). There are some pieces of public art (Figure 24) in the site to make it more interesting, such as small sculptures and a temporary piano. By using wood for shelters and structures, paving gravel and woodchips on the pathways, and adding several green edible plants, the site could give people a nice sense of nature.

Figure 24. Public Art Pieces. (Photo form Facebook).

- Event and Programming:

Volunteering: Beacon Food Forest has a very high community involvement. In 2015, over 800 people participated and donated 8000 hours to this project. From 2014–2016, BFF hosted monthly work parties throughout the year, according to the BFF annual report, and each event attracted 60–100 volunteers on average in the year 2016. Work parties have different themes, such as planting new plants, sheet mulching, building pathways, harvesting food, pruning trees and composting organic material, to help with site construction and maintenance. Food & Harvesting: The harvest festival held on the site each year is open to the public. The food provided utilizes ingredients harvested from the food forest and other local sources. In addition, visitors are encouraged to bring their own dishes that they share with others, to celebrate the harvest season.

Education: Education events and tours are an important form of outreach for BFF. The BFF educational program Permaculture Education Collective delivers classes on and off-site that are open to the public throughout the year. Topics in permaculture, including medicinal plants, seeds, compost, and fruit tree pruning, are discussed. Those who wish to participate can sign up online. In addition, BFF provides educational classes for certain groups such as local high schools, elementary schools, church groups, and hospitals to teach organic gardening techniques and permaculture knowledge; for instance, in 2015, BFF partnered with Planned Parenthood to deliver healthy living lectures and provided an introduction to pollinators for several hundred students at Franklin High School (2015 BFF Report).

Swale Floating Food Forest

Location: Brooklyn Bridge Park at Pier 6, and Concrete Plant Park, New York City, New York.

Operate Time: May – November, Thursday – Sunday.

Size: 130-foot by 40-foot floating platform (0.11 Acres).

Swale is an art project built on a barge, which was established in 2016 by artist Mary Mattingly in New York City. The project began as an idea to advocate for food to be grown on some of the 30,000 acres of public land in New York City. Picking one's own food is illegal on New York City public land, so Mattingly and a team of stakeholders gathered together to construct a dense garden of edible plants atop a barge, which is technically legal due to a loophole created by waterway common law.

The old construction barge was transformed by filling it with soil, edible plants, and flowers (Figure 25). With the edible annuals, perennials and herbs, it provides free fresh food, but also runs as a piece of interactive public art. The mission for Swale is to connect people with nature and highlight the importance of affordable and healthy food. Swale provides new ideas and models to emphasize the problems of food security (Swale, n.d.).

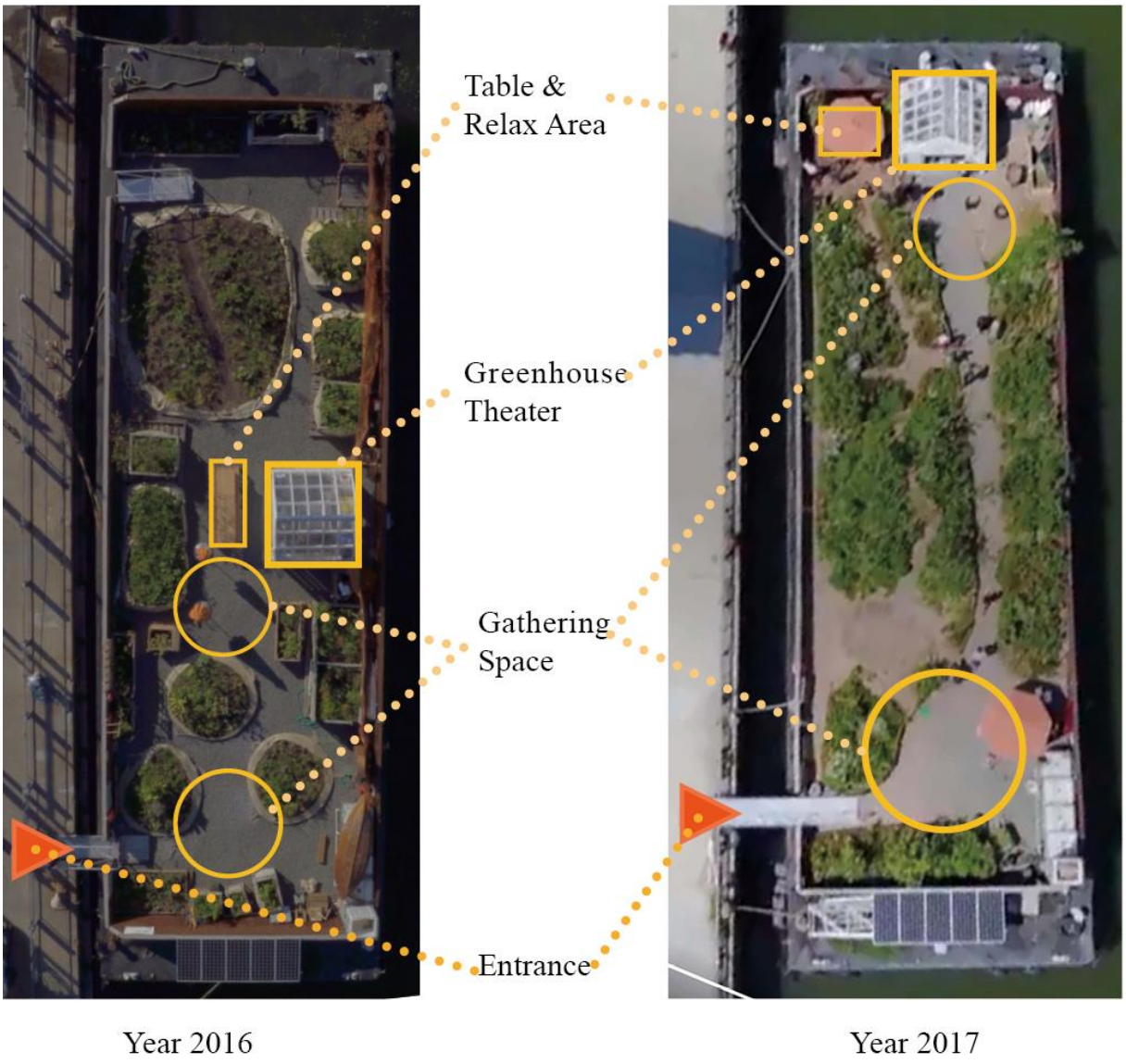


Figure 25. Swale Floating Food Forest Site Context. (Graphic by Author).

- Basic Infrastructure:

Access to Site: As a movable barge, Swale can dock at different locations. In the year 2016 and 2017, Swaledocked near urban parks (Figure 26): Brooklyn Bridge Park and Concrete Plant Park, which gave the public convenient access to the barge. It is open Thursday to Sunday, from 1-6 pm. For outside visual access, Swale has small signs (Figure 27) on the entrance that indicate its name and opening hours, but they do not indicate its public food-producing function clearly. However, Swale itself, as a public art project, could still gain people's attention and interests.

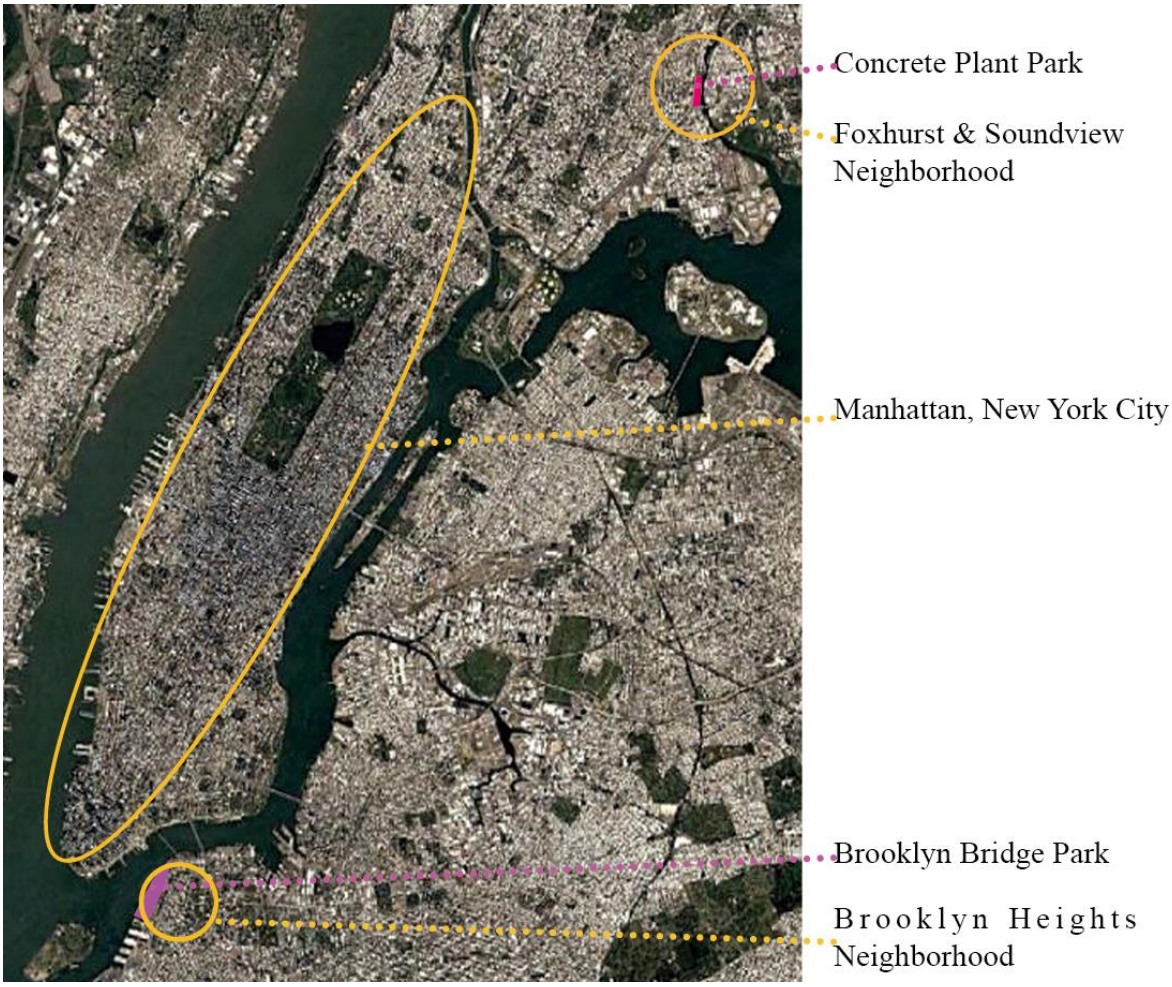


Figure 26. Swale Floating Food Forest Location. (Graphic by Author).

Figure 27.A, 27.B. Site Entrance Sign. (Photo from Untapped Cities by Michelle Young & Swale Instagram).

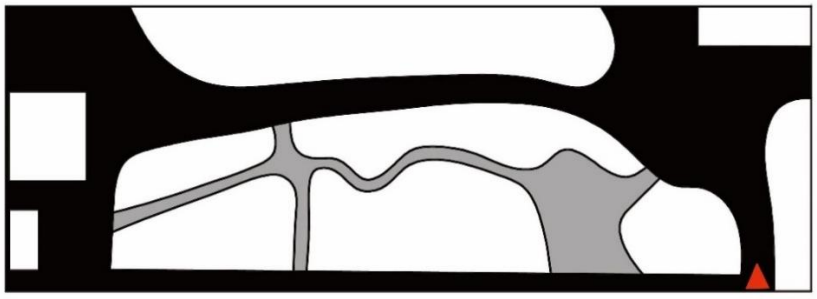
On Site Access to Food: In the site, a red sign reading “Swale Public Food” (Figure 28) shows people that the food is available for public foraging. In addition, there are small plant identification signs (Figure 29) besides some plant materials to show the uses of each plant, but not many. The signs tell people which part of the plant is edible, and how to cook it, which encourage people to forage.

Figure 28. “Swale Public Food” Sign. (Photo from swaleny.org).

Figure 29. Plant Identification Sign. (Photo from swaleny.org).

The pathway in Swale is very clear (Figure 30). In the 2016 and 2017, the designs were different. The arrangement of the planting area in 2016's design is separate, composed of small planting patches. There are no main pathways or spaces for visitors to wander around in. In 2017's design, there is one 5-8 foot main pathway with a winding sub-pathway in the planting area. These two different design approaches both give visitors access to edible plants; the traffic flow for the former one is more random, and that of the latter one is more organized.

Year 2016.



Year 2017.

Figure 30. Swale Pathway System. (Graphic by Author. Color black is main pathway, grey is sub-pathway in the planting area, red triangle is entrance).

Maintenance: A compost site is installed at the corner to deal with weeds and waste food to help with the site maintenance.

- Attractive Amenity:

Food: Swale's plant palette is made up of perennials, fruit trees and shrubs, leafy self-seeding annuals and salt loving grasses (swaleny.org). In 2017, an apple orchard sponsored by Heineken USA's Strongbow Apple Ciders was placed atop a large man-made hill; the hill allows deeper root space for fruiting trees. Right now, there are about ten tree species, such as apples and plums, about ten shrub species, such as blueberry, blackberry and gooseberry, and abundant edible and medicinal herbaceous species on board. Considering the diversity of the visitors' ethnic backgrounds, some plants like cilantro, basil, and tomatoes have been chosen (Nandi, 2017) in order to create a connection with culture.

Activity Support Hardscape: Even within a small acreage, Swale still offers gathering spaces for hosting activities. In the design for 2016, the gathering space was in the center of the barge, with a greenhouse, a wooden table and benches, and two outdoor umbrellas. In 2017, there were two gathering spaces, one at each end of the barge: the one near the entrance is more open, with a shelf and kiosk, while the one on the other side had a greenhouse theater, outdoor umbrellas, wooden table, benches and a temporary movable table and chairs. The white 10 x 12 foot greenhouse theater and a pavilion on the barge, built by the arts group Biome Arts, is the landmark of the barge. It also serves as an artist gallery, activist meeting area, performance space, and a space for holding speeches and presentations (Figure 31). When shows are held in this greenhouse, visitors could sit or stand by the wooden table and chairs to watch. For example, in June 2017, a night of chamber music was held on Swale with approximately 50 or so attendees

on the barge (Figure 32). In addition to holding group activities, Swale also allows individuals to wander around and relax. According to founder Mary Mattingly, people come onboard to pick food, or to just see what is going on. Some people come to enjoy the space—they have lunch at a table, or relax with family and friends (Morris, 2016).

Figure 31. Greenhouse Theater. (Photo from Swale Facebook).

Figure 32. Music Event Held on Gathering Space. (Photo by Tyler Woods of Technical.ly Brooklyn).

Education: Plant information signage has been installed beside the edible plants (Figure 33). It indicates which part of the plant is edible, how to cook it, and its medicinal value. According to Mary Mattingly, people are sometimes surprised to learn what they may eat (Levine, 2017).

Figure 33. A, 33. B. Plant Information Signage. (Photo from Google Image & Swaleny.org).

Other Element of Interest: A piano sculpture (Figure 34) was installed as public art to make Swale a more interesting place. Swale also could give visitors a sense of nature, as the gravel material on the pathway and the rusty metal on the planting edge, combined with the edible plants, give the visitors an escape from the metropolis.

Figure 34. A, 34. B. Public Art on Swale. (Photo from SwaleNY Twitter).

- Event and Programming:

In the year 2016, Swale welcomed over 60,000 visitors and hosted 100 public programs, according to Mattingly, throughout the summer and fall, Swale averages 500 visitors a day, three workshops or events a week, and four group tours a week (Morris, 2016).

Volunteer: volunteer work days are held on site to help with construction and site maintenance. Volunteers help to improve pathways, make compost, and maintain plant materials. Some volunteers also provide information for visitors to encourage them to harvest food, tell visitors the food is free for public harvest, and what plant materials are ready to be harvested.

Food and Harvesting: in October 2016, Swale cooperated with Brooklyn Bridge Park to celebrate the harvest festival by providing public tours on the barge, and collaborated with Garden Kitchen Lab to host a public meal consisting of teas, salads, and grilled vegetables to celebrate the fall season and food production. During the Brooklyn Seed Freedom event, visitors can bring seeds they are willing to swap for others. During this event, visitors also harvested seeds from Swale, and packaged them in preparation for starting an open-source seed library in Brooklyn (Swale Facebook).

Art: Swale provide diverse art events for visitors (Figure 35). Public art events include weaving and rope making with plants, plant drawing and mapping, greenhouse painting and music concerts, and workshop drawing exercises in which participants use plant-based inks derived from the plants on Swale.

Figure 35. Art Event on Swale. (Graphic from SWALE Website).

Education: educational events such as edible and medical plants tours and lectures about food justice and clean water are open to the public. In addition, Swale works with school programs to provide hands-on opportunities for students to learn and enjoy permaculture, plant biology, environmental policy, natural dyes, public arts and design. Currently, Swale provides three workshops – natural color dye, permaculture and herbal ethnography.

Other: Swale also invited local companies to hold workshops (Figure 35), such as pickle making with Atina Foods, and facial toner and oil cleansers making with All Green Everything. These workshops not only provide hands on events, but allow people to sell their own products. This is a good idea, as the commercial vending could attract visitors and local small businesses could be supported.

Figure 36. Workshop on Swale. (Graphic from Swale Website).

Urban Food Forest Design Guidelines

This section provides an analysis and conclusion of case studies based on the observation points developed in Chapter 2, in order to answer the question: **What design principles should be used in order to integrate a food forest into an urban open space and evoke public participation?** The design guidelines are mainly based on the former three case studies by following the points of an observation system. In addition, several additional cases also have been studied to add unique features in the design guidelines. A summary chart (Table 1) at the beginning will provide an overview, and a detailed design guideline will provide further explanations. Finally, an evaluation check chart (Table 2) for the three earlier case studies will be given.

Urban Food Forest Design Guideline Summary Chart (Table 1):

		Design Elements	Description
Basic Facility	Access to Site	Opening Time	Physical: Site operating time, and whether it is accessible all day to the public.
		Transportation to Site	Physical: Easy to get to. Public transportation, parking lot, biking, walkways for pedestrians.
		Connect with Urban Context	Physical: Easy to walk inside. Site entrance and circulation connect with existing urban pedestrian system, access to and throughout the site.
		Gateway/ Entrance Marker	Visual: Make entrance easy to find and make sure information at the entrance is easy to read. The information should indicate the name of the site and convey a message to visitors that food is free for public.

	On Site Access to Food	Pathway/ Circulation	Physical: Ensure clear and clean pathways that can lead visitors to plant materials.
		Wayfinding Map	Visual: Orientation Master Plan map shows planting area; tells visitors where to find food.
		Planting Zone	Visual: In the field, have a clear planting boundary; distinguish it from other land use.
		Food-finding Signage	Visual: Permanent and temporary signage beside plant material, show plant species, which part is edible, and when is ready to harvest.
	Maintenance	Paving Material	Easy to maintain and keep clean.
		Waste Food Receptacle	Places to deal with waste.
		Visiting Signage	Show visitors matters that need their attention when visiting and harvesting
Attractive Amenity	Food	Number of Species	Create high diversity of edible plant material using trees, shrubs, ground cover and vertical plants.
		Fruiting Season/Time	Choose plant species with different harvest times; try to extend harvest time of the site.
		Cultural Representation	Use some plant material that could represent the local culture.
		Native Species	Use some native species to improve site interests.
	Activity Support Hardscape	Gathering Plaza/Space	Provide an open space for large group activities and events, and nodes for small group meeting and individual relaxation.

		Information Board/Kiosk	Show current and upcoming events, work tasks, news.
		Table	Table for supporting events, food processing, exhibitions, and as a place for people to relax.
		Bench/Seating Area	Seating area for group activities and individuals.
		Shaded Area	Provide shaded area for people to relax under, such as an outdoor umbrella, canopy tree, pergola, or other.
		Large Structure/ Building	Structure or small building for activities/information center and landmark.
		Water/Sink	Food and hand cleaning.
		Tool Storage	Provide access to tools on workdays.
		Miscellaneous	Public restroom, compost, water feature, fire place, or other.
	Education	Educational Interpretive Signage	Explanatory information about food security, urban agriculture, permaculture, food forest, ecosystem, or other.
		Plant Information Signage	Signage beside plant materials to show information about specific plants so that people can acquire knowledge during the harvest.
		Other Education Sites	Butterfly garden, children's garden, herbal garden, flower garden, or other.
	Other Elements of Interest	Sense of Nature	The following materials could be used: wood, log, wood chips, irregular-shaped local rock, gravel, rusted metal, fabric, or other.

		Lively Edge	The edge of the site should be inviting or food related, such as install seating areas, edible plants or food retail.
		Public Art	Increase site interest and interaction with visitors, with small sculpture, painting, mural, or other.
		Playground	Outdoor play area for kids and their family would make the site more vibrant.
		Vending	Food, nature and health related vending, such as farmers market, food truck, workshop, etc.
		Community Garden	A typical form of urban agriculture, sign up plots for private food produce.
Event	Volunteer Work	Site Construction	Volunteer help to do site construction, such as planting, building pathways and structures, etc.
		General Maintenance	Volunteer help to do site maintenance, such as watering, pruning, planting, weeding, collection of redundant produce. etc.
		Education	Volunteer help to conduct tours and educational programs.
	Food	Food Harvest Celebration	Encourage public and community harvest, smoothie party, organic food party, vegetable and fruit party.
	Art	Art Event	Site decorating or other nature, food, health related art activities, such as stone painting, flower and seed drawing, fabric dyeing.
	Education	Education Tour	Tour for local community or school that educate the public about food production and food forests, provide plant information, compost, water runoff, etc.

Urban Food Forest Design and Planning Guidelines:

Basic Facility:

Access to Site:

•Opening Time: It is better if the site is open every day, as this will make it accessible to visitors all day long. If site management does not allow, the opening time should be at potential heavily used time, such as at noon, afternoon or at weekends.

•Transportation to Site: The site should be built near the place where transportation is convenient, so that visitors can easily access it, such as near a public transportation station, with parking lot and bike racks nearby; moreover, it should be easy to walk to. Building it near a heavily-used popular space is ideal, such as public parks, urban plazas or community centers.

•Connection with Urban Context: The entrances and site circulation should be connected to the existing urban roads and pedestrian system, so that it is easy for visitors to go inside or walk through it.

•Gateway/Entrance Marker: Provide visitors with visual access to site. A gateway signage should be large enough to attract attention and identify the site's entrance. Also, it should convey a clear message about the theme of the site and tell the public that there is free food for public. This gateway could be a literal gateway, markers beside the entrance, or even an artistic sculpture. It should incorporate unique artistic, sculptural, or culturally-expressive elements appropriate to the urban food forest, such as a sign stating "public edible forest – free food forage," and it should be colorful.

Figure 37.A, 37. B. Gateway/Entrance Marker.

37.A. Dr. George Washington Carver Edible Park Gateway Marker. (Photo from Dr. George Washington Carver Edible Park Facebook).

37. B. Del Aire Fruit Tree Park (Photo from Fallen Fruit Website).

On Site Access to Food:

•Pathway/Circulation: Ensure the inside pathway network is well arranged; it should lead visitors to edible planting materials. In addition, the pathway hierarchy should be clear, and the main pathway should meet the ADA standard, i.e., it should be 3–4 feet wide. The sub-pathway inside the planting area could be narrower for visitors to slowly wander around and enjoy harvesting. If the shrub and groundcover is too messy, and without a pathway, visitors may not be willing to step inside. Moreover, without a clear pathway, visitors will likely step on the edible plant material and harm the plants while harvesting (Figure 38, without pathway vs with pathway). Even though the site will not feel forest like with such an approach, this will be more suitable for an urban public space. However, there are some methods to fix this situation. An explanation will be given later in the "sense of nature" paragraph. Pathways can also provide opportunities for strolling through the forest simply for enjoyment. For example, the "edible

maze” in the Whetherby Park Edible Forest still has children running around it, even when it is not the fruiting season.

Figure 38. Pathway System. Spring Food Forests (without pathways) vs Great South Florida Food Forest (with pathways).

•Wayfinding Map: An orientation master plan map can demonstrate the location of the planting area and primary planting materials, and tell visitors the specific food-harvest locations. This map should be placed at obvious places such as the entrance or gathering plaza. In a mixed-use area, in particular, this map is necessary because the planting materials may not all be edible or available to the public. For example, if this food forest is built on a park site or a segment of an urban street with existing inedible plants nearby, visitors might unconsciously go outside of the food forest boundary, and then pick some inedible plants, causing a safety issue. Moreover, if a community garden is nearby (the produce in a community garden is for private individuals, not for the public), visitors may unwittingly pick private produce. Beacon Food Forest, which has a P-Patch community garden on site, provides a master plan map (Figure 39), with the public harvest area marked with the color green.

Figure 39. Wayfinding Map. Rocky River Nature Center Food Forest (Photo from Rocky River Food Forest Facebook).

•Planting Zone: Not only on a map, but also in the field, a clear food planting zone boundary should be built, especially in a mixed-use site. A different paving material could be used to emphasize the boundary. Alternatively, the area could be demarcated with paint. Compared with the wayfinding map, this approach will visually show the harvest area to visitors in a straight-forward way.

•Food-finding Signage: Permanent and temporary signage can be used. Permanent plant identification signs can be installed beside planting materials (Figure 40), providing information such as plant species, when to harvest, which part is edible, and how to cook it. Temporary harvest signs (Figure 41) can be installed during the harvest season to inform visitors when the food is ripe in order to encourage harvesting. This type of signage should be obvious enough to attract attention, such as by using a bright color.

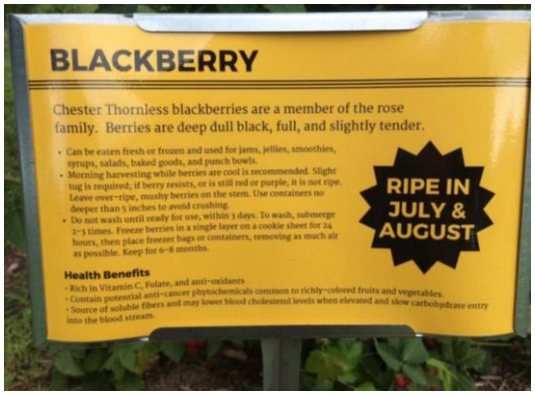


Figure 40. Plant Identification Sign. (Image form The Refuge Food Forest Facebook).

Figure 41. Temporary Harvest Sign. (Photo from Beacon Food Forest Facebook).

Maintenance:

•Paving Material: The paving material for pathways or other food harvest spaces should be easy to maintain for cleanness; material could be concrete or stepping stones.

•Waste Food Receptacle: Visitors should be provided with a trash bin or compost area to drop wasted food, so that food is not thrown on the ground, as this will attract unwanted insects and animals, and cause safety issues.

•Visiting Signage: Signage should highlight matters that visitors need to pay attention to when visiting or harvesting, inform visitors that they should not harm plants, should save produce for others, and keep the site clean (Figure 42).

Figure 42. Visiting Signage. (Photo from Basalt Food Park Facebook)

Attractive Amenity:

Food:

•Number of Species: A highly diverse plant system should be created in the urban food forest system, with trees, shrubs, ground covers and vertical plants, to produce nuts, fruits, vegetables and herbs. The diverse types of food production can evoke visitors' interests to explore the site and encourage them to harvest produce. Primary species that are a good fit with the local climate should be chosen, and native species should be used as well. In addition, a variety of plant species that are not commonly commercially grown are worth a try. The food that cannot easily be found in a grocery store might be a big attraction for visitors.

•Fruiting Season/Time: Different planting materials should be used in the respective growing season and fruiting time to extend food accessibility for visitors to enjoy foraging in the food forest.

•Cultural Representation: Some plant materials represent local culture. Just as some cities and states have their representative fruits or vegetables, by planting these materials, the food forest could gain a representative site identity. Moreover, if this urban food forest is located in a community with a very diverse cultural makeup, some plant materials that are used in particular cooking recipes or grown in the community member's homelands could be planted. This can give people a positive emotional response, making the space more attractive.

•Native Plants: Native edible plants not only support local ecosystem, wildlife and pollinators, but also provide educational opportunities and improve site interests. By harvesting native edible plants, visitors can learn to recognize these species (some of which are rarely seen in commercial grocery stores), become familiar with their local plant communities and natural living environment and evoke local identity.

Activity Support Hardscape:

•Gathering Plaza/Space: Because an urban food forest is the site of many events, a large gathering space is necessary to provide an open area to support group activities and events. During the day, volunteers can sign up for tasks; a harvest party could be hosted for food celebration with a large group of community members (Figure 43), temporary tables and chairs can be added for sharing food and watching a music performance; educational tours and public speeches can also be held on the gathering plaza. Moreover, small nodes should be provided for small group meeting or for individuals to relax. The small nodes can be placed at entrances, intersections of pathways, pathway extensions, gathering plaza edges, planting areas, etc., and furnished with benches, shaded area and other small structures.

Figure 43. Gathering Plaza. (Photo from Beacon Food Forest Facebook).

•Information board/kiosk: An information area (Figure 44) should be provided to show current and upcoming events, work tasks, and harvest news. It could be a chalkboard panel, or pin-up board, located at obvious places such as the entrance or gathering space, together with a way finding map.

Figure 44. Information Kiosk/Board. (Image from The Refuge Food Forest Facebook; the Refuge Food Forest is working on a new message center and a large format updated map and other materials to help with advertising and recruitment).

•Table: Permanent tables should be placed near the gathering space and used for holding events, food processing, exhibitions, and relaxation. If the space condition does not permit, temporary tables can be used when events are needed.

•Bench/Seating Area: Comfortable and flexible seating area should be provided for group activity seating or relaxation; formal benches or an informal seating area, such as low walls, planter edges, large rocks or wooden log add to the welcoming experience. Seating areas should be designed at the gathering area, site edges, or near the planting area along with pathways to support relevant needs.

•Shaded Area: Use of outdoor umbrellas, canopy trees, and pergolas beside the seating areas provide comfortable shaded areas for visitors to relax in the harsh sunshine.

•Large Structure/Building: The structure can function as an activity center with seating and shaded areas, and located near the gathering space for holding events and shows (Figure 45). Furthermore, the structure supplies a wall for the site wayfinding maps and information board. The structure adds visual complexity to the site, acts as landmark and cohesive power, and can attract visitors' attention and create a sense of belonging.

Figure 45. Large Structure/Building. Art events exhibition on Swale (Photo from Swale Facebook) & Harvest Party at Beacon food forest (Photo from BFF Facebook).

•Water Sink: Water sinks should be installed near the activity center, gathering space or planting area for hand washing, food cleaning or irrigation. Sinks must conform to local sanitation regulation.

•Tool Storage: Tools such as shovels, work gloves, wheelbarrows, tables and chairs are needed to support site construction, maintenance work, and events. It is better to have a small storage room so that the tools are not lost or stolen. If the site is not large enough, the tool storage room can be combined with another site structure such as a small building, seating area or shaded structures, to make full use of the space.

•Miscellaneous: There is other infrastructure that can support the visitors' needs in the urban food forest to make the site more convenient and interesting, such as fire place for group events, lookout place and water feature for site aesthetics, public restroom for visitors' convenience, and swale for rain water runoff management, etc.

Education:

•Educational Interpretive Signage: This type of signage (Figure 46) explains general information about food security, urban agriculture, permaculture, food forest, ecosystem or other site related knowledge. Signage should include graphics and photos, with a bold, strong heading and clear, concise text.

Figure 46. Educational Interpretive Signage. (Photo from Beacon Food Forest Facebook).

•Plant Information Signage: Small signage (Figure 47) placed besides plant materials shows information about specific plant species, growth habits, harvest methods, and other interesting information. It lets people acquire knowledge while harvesting. This type of signage could be combined with the food-finding signage.

Figure 47. A, 47. B. Plant Information Signage. Wetherby Food Forest (Photo from Backyard Abundance Facebook) & Swale Floating Food Forest (Photo from Swale Facebook).

•Other Educational Sites: Except for food harvesting in the urban food forest, if the site permits, other food and nature related areas that could be used for multiple educational opportunities include a scented garden, butterfly garden, herbal garden, and flower garden. These elements can attract children and their families; moreover, they can be used for enriching school tours.

Other Elements of Interest:

•Sense of Nature: The urban food forest could be connected with nature, providing visitors with a space that feels like a natural forest and farmland, which would give them an opportunity to escape the urban atmosphere. Materials such as wood, logs, wood chips, irregular-shaped limestone, gravel, rusted metal, and fabric can be used in the site for pathways, public art, and other site furniture (Figure 48). In addition, the style of small structures can be designed to evoke people's feeling of nature, such as the style of the forest cabin and farm shed (Figure 49). The design style for any urban food forest is not limited; besides natural style, other design and sleeker materials might also work, depending on the site's context.

Figure 48. A, 48. B. Gaia's Peace Edible Garden (Photo from Backyard Abundance Facebook).

Figure 49. Lafayette Greens Urban Agriculture, the design of storage sheds references farm landscape. (Photo from Beth Hagenbuch, ASLA Website).

•Lively Edge: Inspiring and enticing visitors, the edges of a food forest serve as initial contact for visitors. The edge of the urban food forest is close to the pedestrian routes; thus, it can attract visitors' attention and emphasize the site theme. Food elements should be placed along the edge, such as seating areas, edible plants, food related retail (also surplus produce in food forest site could be stored in front of the retail's door for passersby to pick for free), food theme art, etc. These elements form a vibrant and inviting space and create potential food forest publicity opportunities.

•Public Art: General art such as small sculptures, paintings, and murals, can be placed in the entrance, pathway, gathering space, and site edge to emphasize the theme of the food forest, invoking nature and thus increasing site interest and interaction with visitors. In addition, public art can be combined with the design of signage, the bench, the pathway, and other site structures. Themes, color, schemes, logos give cohesive messages and keep identity the site.

•Playground: As food production and education functions have been provided in the urban food forest, the site can be a big attraction for kids and families. In particular, if the site is located near a community neighborhood, a playground (Figure 50) could provide a recreation

opportunity for children. The playground can be an individual site that is installed beside the food forest, or it can be a small structure in the edible planting area to create an edible playground, such as an edible maze or logs for kids to jump on.

Figure 50. Gaia's Peace Edible Garden Playground. (Photo from Backyard Abundance Facebook).

•Vending: Vending can be food, nature and health related. Daily vending can be a small coffee shop, food truck; events vending can be a farmer's market, food truck, or local craft workshop. In addition, the location of the vending is flexible; it could be a fixed structure, or could be movable site with temporary tables and trucks.

•Community Garden: If the site is large enough and has a community nearby, a community garden can be installed for individuals to sign up for plots to produce their own food. This is another way to attract community engagement. However, a clear boundary should be provided to separate the garden from the public harvest.

Event and Programming:

Volunteer Work:

•Site Construction as Process: Volunteers can take part in the site construction phase, such as planting edible materials, building pathways and small structures. These events can reduce the budget for hiring labor, while also provide a learning experience. They could act as an education program.

•General Maintenance: Volunteers could help to do site maintenance, such as watering, pruning, planting, weeding, and collecting of redundant produce. As for the food production sites, the urban food forests require strong neighborhood support and volunteers that are willing to assist in their care for the sites, so the general maintenance events should be planned as long-term and year-round events.

•Education: Volunteers help to provide educational information to visitors and help with site educational tours. Volunteers could provide educational information for visitors on site, such as plant species, growth habits, harvest and cooking methods, and medicinal value, to improve people's visiting and harvesting experience. Also, volunteers could help with educational tours and classes, to organize and give lectures for educational events.

Food:

•Food Harvest Celebration: Food is a unique and attractive feature in the urban food forest site; thus, organizing events to celebrate the harvest is significant, and it could be a very efficient way for site publicity. Several food harvest parties can be held during the growing and fruiting season, such as smoothie party, organic food party, vegetable and fruit party, to encourage public harvest and community participation. The food in the harvest festival could be

food collected on the food forest site, or the forest could also cooperate with local food related organizations to provide food on harvest celebration.

Art:

•Art workshop: Art can be a big attraction to people. The urban food forest site could host art workshops on topics like site decoration or other nature, food, health related art activities. Site decorating such as pathway painting, design of signage, and creating of site structures. Other art activity includes stone painting, flower and seed drawing, fabric dyeing, etc. Engaging local artists might also enrich the community experience.

Education:

•Educational Tour and Class: The urban food forest site can be used to provide outdoor classrooms and hands-on experience with nature and agriculture. Compared with self-guided learning on site by using educational signage, the educational events can be more interesting and vivid. By holding tours and classes, the site can convey information about gardening skills, food production, food forest, plant information, compost, water runoff, etc. Tours and classes could be open to the public, or the urban food forest management could work with specific groups such as schools in the neighborhood to create long-term educational program.

Case Studies Evaluation Check Chart (Table 2).

● ● ● Good ⊙ ⊙ ⊙ Fair ○ ○ ○ None		Design Element	Wetherby		Beacon		Swale
		Urban Area/Community	✓		✓		✓
		Mix-Use	×		✓		×
Basic	Outside Access	Opening Tim	●		●		○
		Transportation to Site	●		●		●
		Connect with Urban Context	●		●		●
		Gateway/Entrance Marker	○		⊙		●
	Inside Access	Clear Pathway/Circulation	●		⊙		●
		Wayfinding Map	○		●		○
		Planting Zone	●		●		●
		Food-finding Signage	⊙		●		⊙
	Maintenance	Paving Material	●		●		●
		Waste Food Receptacle	●		●		○
Attractive Amenity	Food	Number of Species	●		●		●
		Fruiting Season/Time	●		●		●
		Culture Represent	○		⊙		●
	Activity Support Hardscape	Gathering Plaza/Space	●		●		●
		Lively Edge	○		○		⊙
		Information Board	○		●		○
		Table	●		⊙		●
		Bench/Seating Area	⊙		●		⊙
		Shaded Area	○		●		●
		Large Structure/Building	○		●		●
		Water/Sink	●		●		●
		Tool Storage	●		●		⊙
	Education	Overall Signage	○		●		○
		Plant Information Signage	●		○		●
		Other Education Sites	○		●		○
	Other Elements of Interest	Sense of Nature	●		●		●
		Public Art	○		●		●
		Playground	●		○		○
		Vending	○		○		●
		Community Garden	○		●		○
Event	Volunteer Work	Site Construction as Process	●		●		⊙
		General Maintenance	●		●		●
	Food	Food Harvest Celebration	●		●		●
	Art	Art Event	○		⊙		●
	Education	Education Tour and Class	●		●		●

CHAPTER 4

APPLYING CONCEPTUAL DESIGN – Athens Food Forest

Introduction

To exemplify the design guidelines exhibited throughout the previous chapter, the conceptual design of an urban food forest in City Hall Plaza in Athens GA will be presented. The interior of Athens City Hall block is expected to be developed as a "Family Friendly" park based on Athens Downtown Master Plan 2030 for the Athens Downtown Development Authority (ADDA) and Athens-Clarke County; thus, the concept of the urban food forest can be applied to this block.

The design of southwest corner in this thesis will adopt the ideas in Athens Downtown Master Plan 2030 (Figure 51): the parking will be reconfigured at the street level, and a roof will be provided so that the space can serve as a festival and market space adjacent to the park; the old "police building" will be redeveloped, to build basement incubator space, street level commercial areas and an "alley" connector to the inner park.

In this thesis, the northeast corner of this block will not be redesigned in Athens Food Forest conceptual design, because this area currently functions well as an entrance. In addition, as it lacks sunlight and with steep slope (Figure 52), it is not suitable for planting edible materials. On the Athens Food Forest Master Plan (Figure 53), this part will be greyed out.

Figure 51, Athens City Hall Block Planning Plan. (Graphic from Athens Downtown Master Plan 2030).

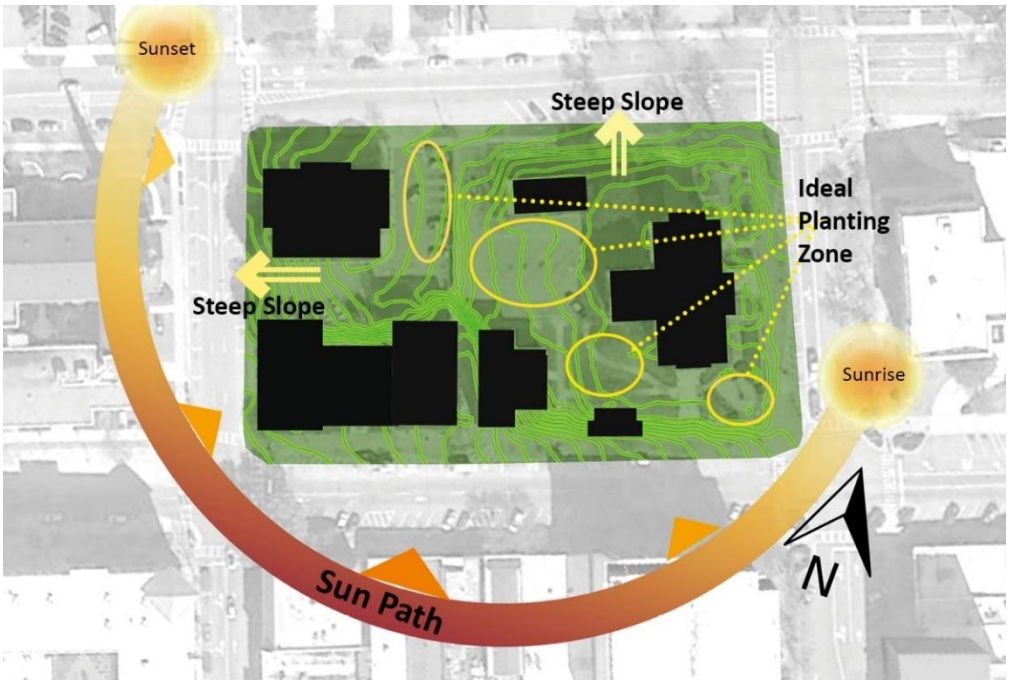


Figure 52, Sun Path and Site Slope Analysis. (Graphic by Author).

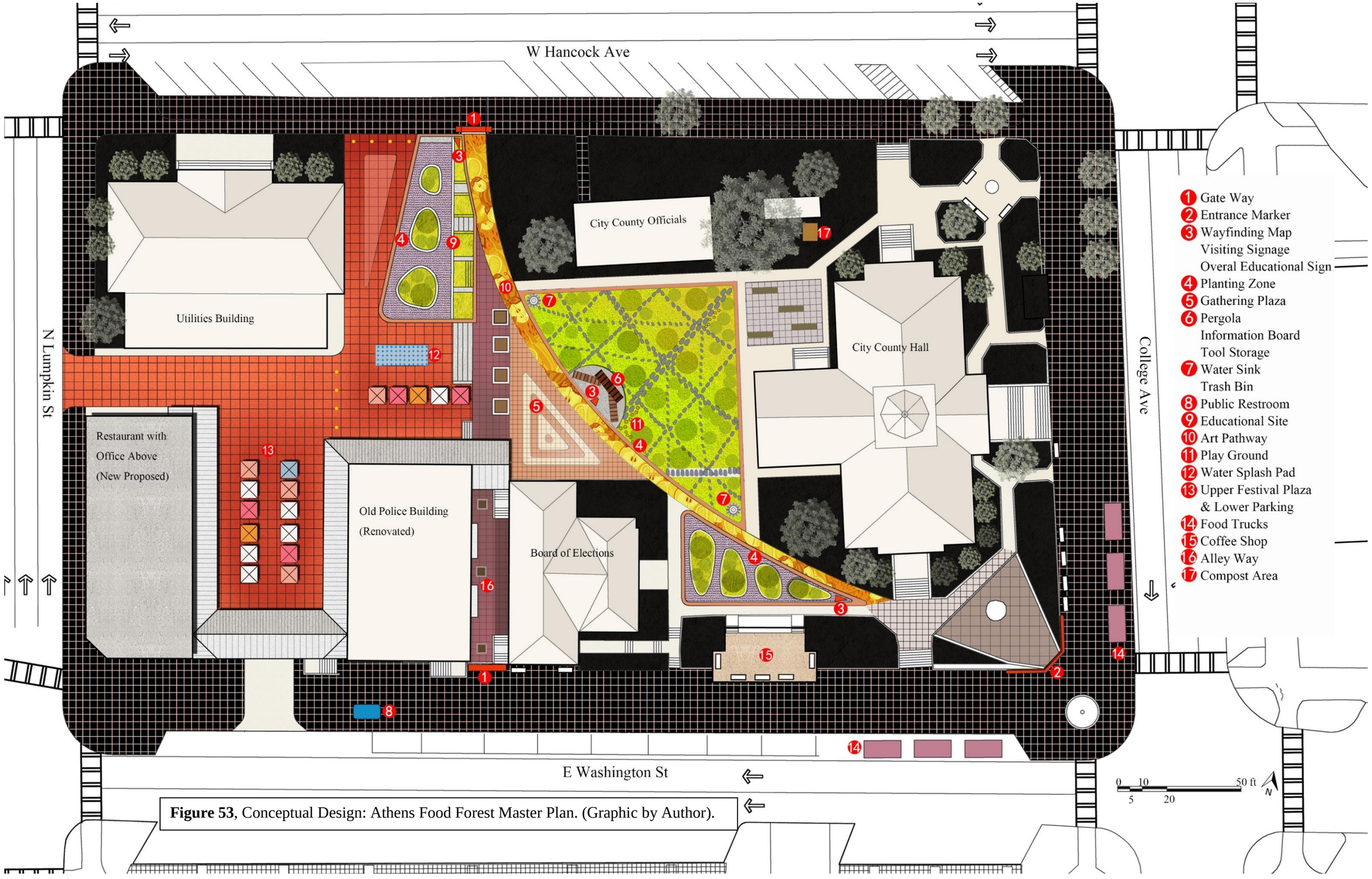
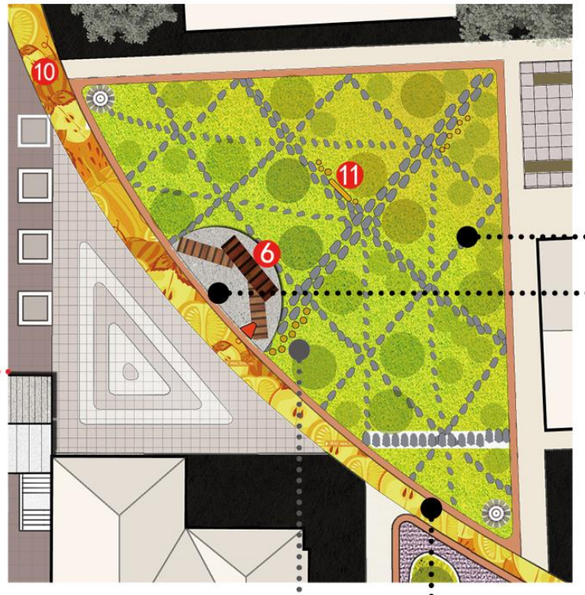


Figure 53, Conceptual Design: Athens Food Forest Master Plan. (Graphic by Author).



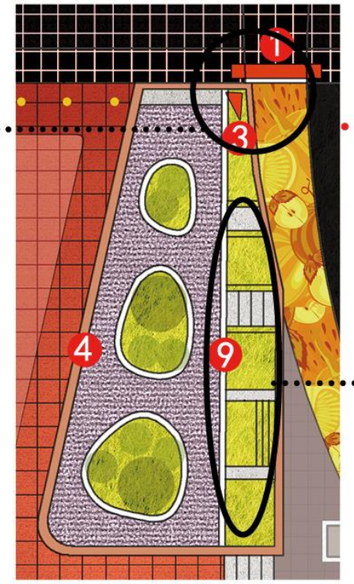
Pathway Paving Style. (Source: Balcony Garden Web).

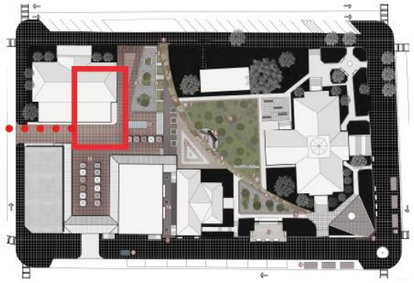
Gathering Plaza and Structure. (Source: Beacon Food Forest Facebook).

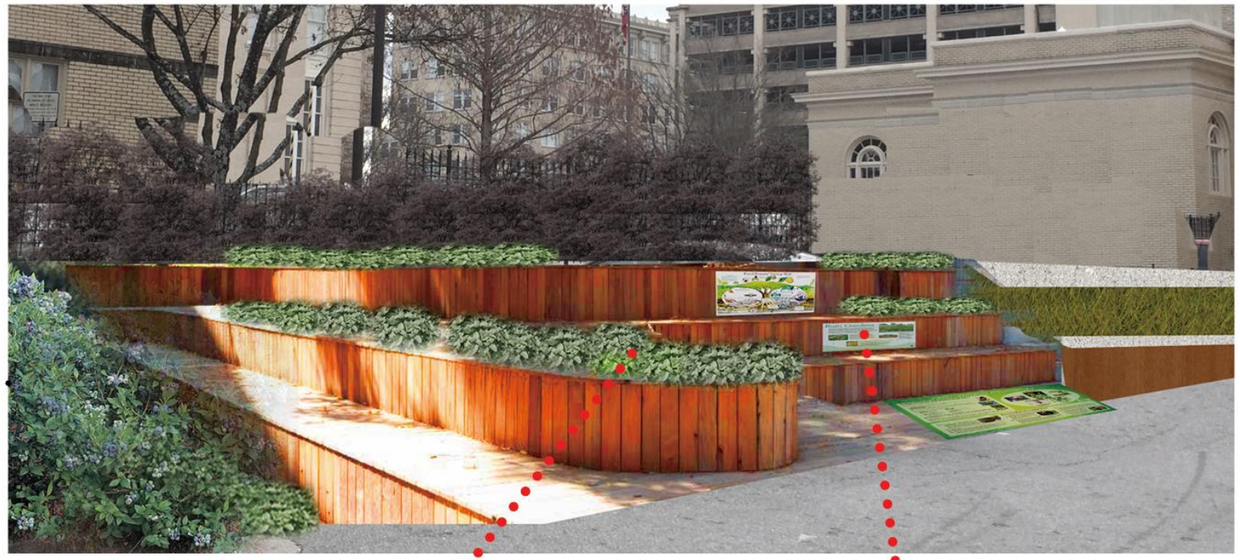
Children Play Ground. (Source: Spiral Garden, Playscapes Website).

Art Pathway. (Source: Matala Streetpainting, Kreta Impressionen) .

Figure 54, Example Images. A. (Graphic by Author).







Educatioal Site.
Source: Graphic by Author.

Gateway Marker &
Information Kiosk.
Source: Friends of Way Park,
givemn.org.

Wayfindign Map. (Graphic by Author).

Visiting Signage.
Source: Basalt Food Park Facebook.

Plant Information Signage.
Source: Refuge Food Forest Facebook.

Educational Interpertive Signage.
Source: Peterborough Green-Up Association.

Figure 55, Example Images. B. (Graphic by Author).

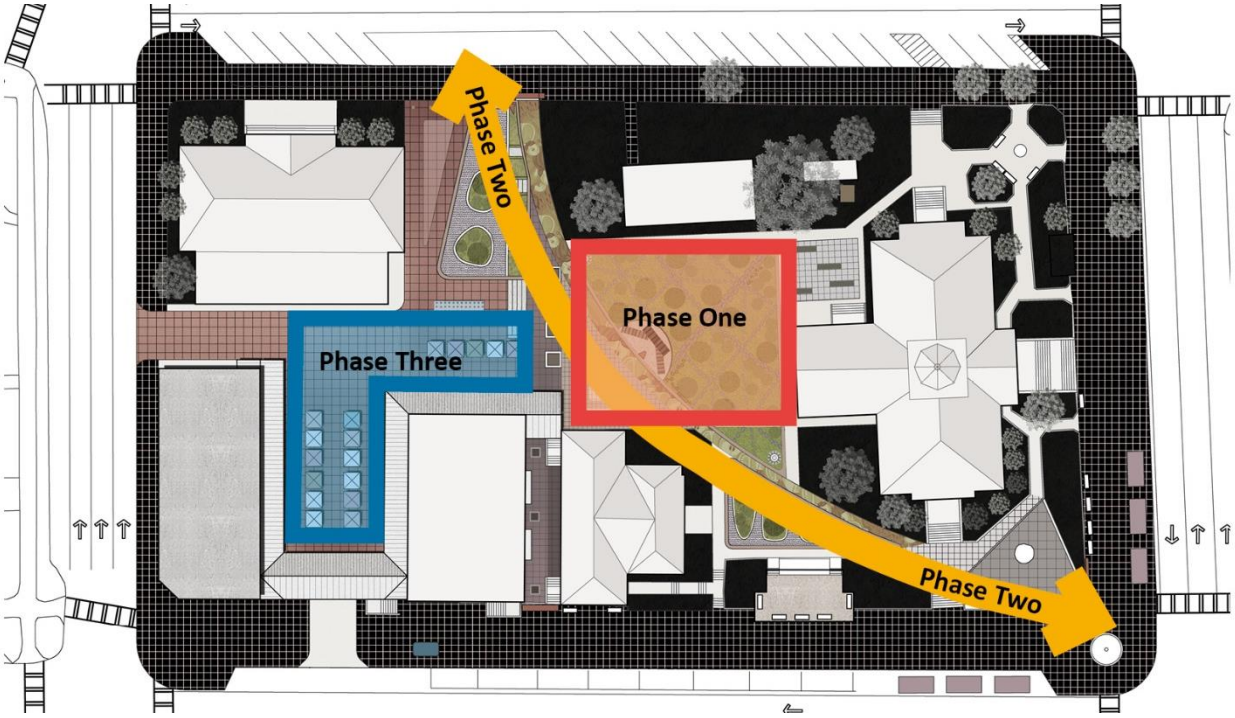


Figure 56, Site Construction Phasing Plan. (Graphic by Author).

Phase one: main edible planting zone and gather plaza. Phase two: site primary pathway and along-side planting zones. Phase three: Festival Plaza/Farmer's Market.

Conceptual Design

Basic Facility:

Access to Site: The site is proposed to operate at all times; no fences will be installed along the edge, with all day access to public. For transportation, the site is currently very easy to get to, as it is located in downtown Athens, GA, with walking distance to the University of Georgia's campus, and just two blocks from the Arch bus station (Figure 57). Street parking is available currently and a parking lot is proposed to install on site on the ground floor. Eight entrances are designed, all connected with existing urban pedestrian system. Three of the main entrances are installed with gateway markers (#1 and #2 in Master Plan). #1 is a small structure

for gateway, and #2 is a marker painted on the ground. Entrance at #2 transformed the original planting bed to the slope, created an entrance plaza, with the food forest theme marker painted on ground, make this entrance more inviting.

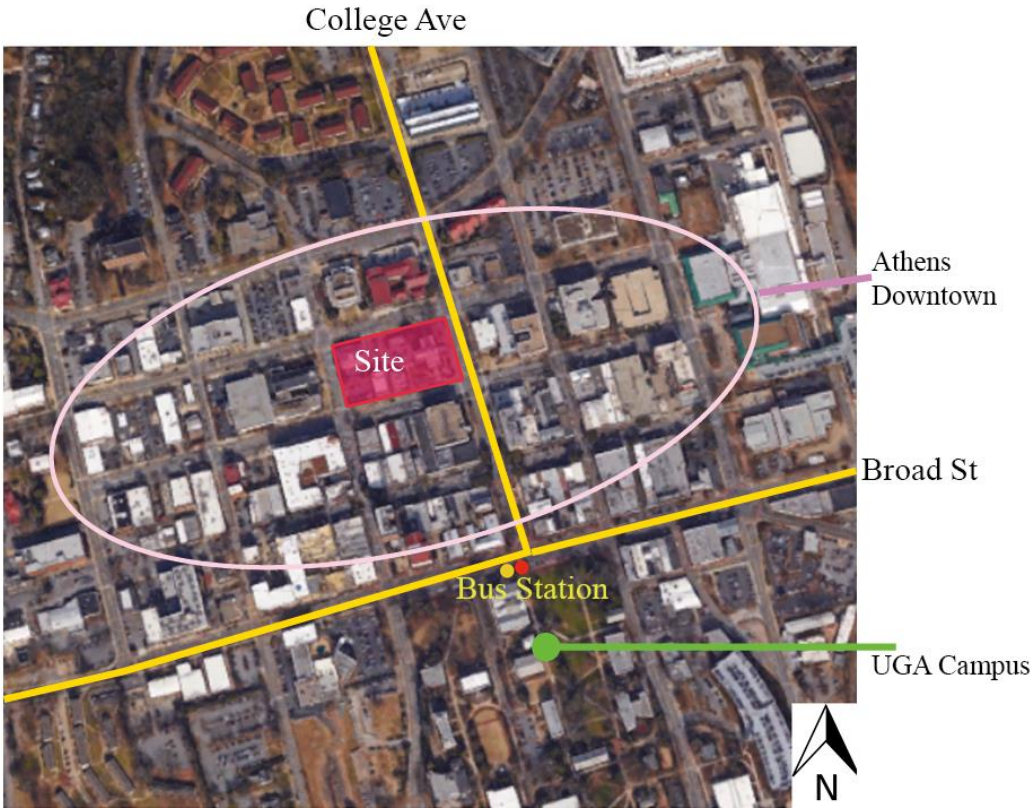


Figure 57. Athens City Hall Site Location. (Graphic by Author).

On Site Access to Food: The pathway on site is very clear (Figure 58), with primary paths and secondary paths that ensure visitors can physically get access to food. The wayfinding maps are installed (#3 in Master Plan) to clearly show three edible planting patches. The planting zones are very clear on site too, with three main parts. The orange color is painted on the ground along the patches edge (#4 in Master Plan). Because in this block, not all the plants are edible, it is necessary to create a color code on site to convey a clear visual message to visitors. Wayfinding map could help visitors to find the edible planting areas. After the plant materials

have been planted, the food-finding signage should be installed, together with plant information signage that holds species name, which part is edible, harvest time, and with explanations of how to cook and other interesting educational information. The temporary signage on a bright color stick can also be installed by workers or volunteers when the food is ready to harvest.

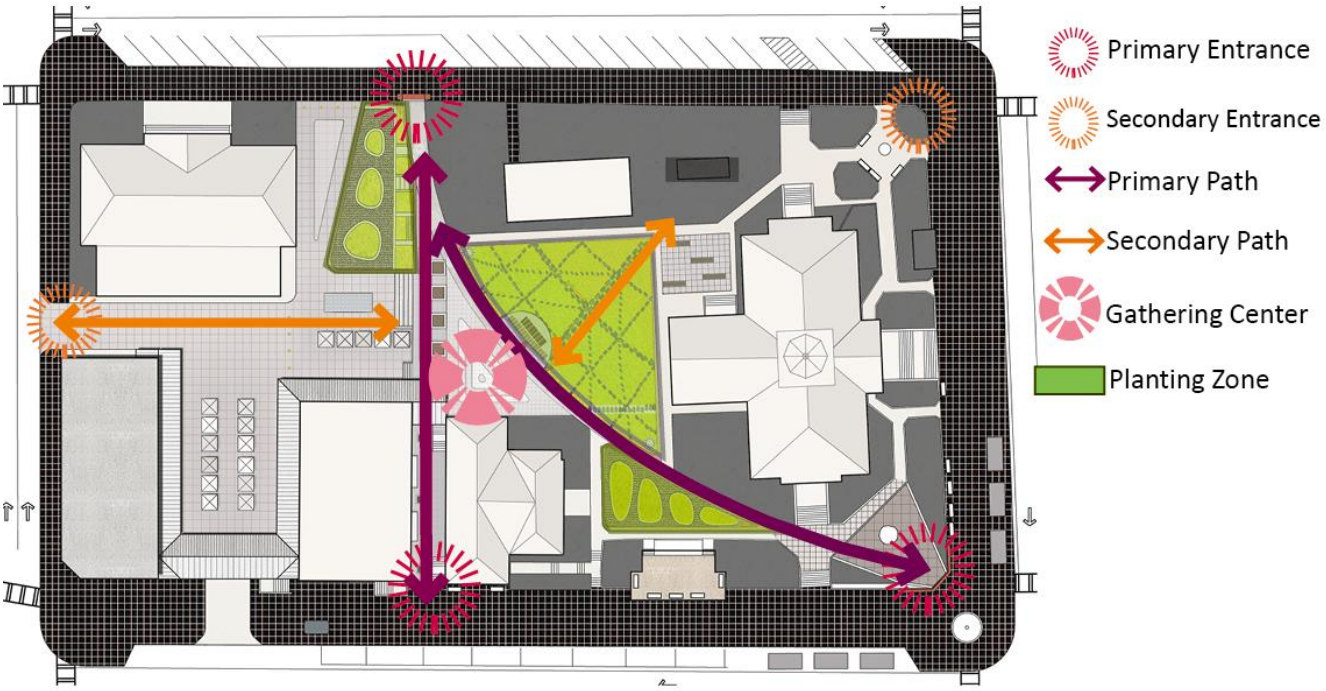


Figure 58. Pathway System and Nodes. (Graphic by Author).

Maintenance: Two trash bins (#7 in Master Plan) will be placed alongside the water sinks. Compost area (#12 in Master Plan) will be built to drop waste food. The visiting signage will be provided (#3 in Master Plan) to remind people to keep the site clean. In addition, irrigation system should be installed on planting zones to make sure the plants are stay hydrated.

Attractive Amenity:

Food: The species should be diverse and have and long fruiting time, but the main species should be suitable for the climate in Athens GA, with relative high yields and less maintenance, also native edible plants are encouraging to use, a list of edible plant materials suitable for Athens, GA area is attached (Table 3). Moreover, Athens is quite diverse— according to 2015 estimates by the Athens-Clarke County Unified Government, the racial makeup is: white 65.4%, Black/African American 27.5%, Hispanic or Latino 10.6%, Asian 4.5%, and Other 1.3%. Thus, having plants represent different cultures is appreciated. Also, no toxic plants should be used. The selecting of species and plants arrangement method in this thesis is a general guideline, the detailed information should work with horticulture and agriculture experts in the future.

Edible Plant Materials for Athens, GA. (Table 3).

Note: * reliably hardy; ● native species		
Edible fruits, nuts, flowers or foliage		
Trees		
* ●	Amelanchier arborea	Serviceberry
●	Asimina triloba	Pawpaw
* ●	Carya illinoensis	Pecan
* ●	Diosporus virginiana	Persimmon
*	Feijoa sellowiana	Pineapple Guava
* ●	Ficus carica	Fig
*	Juglans nigra	Walnut
	Malus sp.	Apple, crabapple
	Prunus sp.	Cherry,plum
	Prunus persica	Peach
●	Fagus grandifolia	Beech
Shrubs/Vines		
	Punica granatum	Pomegranate
* ●	Rubus sp.	Blackberry, Raspberry
*	Rosmarinus officinalis	Rosemary
* ●	Vaccineum sp.	Blueberry
* ●	Vitis rotundifolia	Muscadines and Scuppernongs

●	Vitis aestivalis	Other American grape varieties
Herbaceous		
*	Allium sp.	Chives
	Anethum graveolens	Dill
	Asparagus officinalis	Asparagus
	Foeniculum vulgare	Fennel
*	Podophyllum peltatum	Mayapple
●	Portulaca oleracea	Purslane
*	Salvia sp.	Sages
Medicinal and/or tea		
Trees		
*	Crateagus sp.	Hawthorne
*	Vitex agnes-castus	Chaste tree
●	Sassafras albidum	Sassafras
Shrubs/Vines		
*	Hamamelis sp.	Witchhazel
* ●	Lindera benzoin	Spicebush
*	Mahonia aquifolium	Oregon grape
* ●	Passiflora sp.	Passionflower
* ●	Ruscus aculeatus	Butchers broom
Common “Weeds” with edible and/or medicinal properties		
* ●	Taraxacum officinale	Dandelion
	Verbascum sp.	Mullein
●	Stellaria media	Chickweed
●	Lamium amplexicaule	Henbit
●	Chenopodium album	Lamb's quarters
●	Plantago sp.	Plantain

(Note: Information above from Professor Shelley Cannady, University of Georgia).

Activity Support Hardscape: A plaza is in the center of the site (#5 in Master Plan) connected to in-site paths. It will provide a gathering area for events or group activities. A pergola is built beside the plaza to provide shade, seating and relaxation space for people. It will also function as a landmark (#6 in Master Plan). In addition, a small tool storage and information board is also installed in that spot. The site will be equipped with two water sinks and trash bins (#7 in Master Plan). The site is designed with several seating areas for visitors (Figure 59). At

Athens Downtown Master Plan 2030, a public restroom “Portland Loo” (Figure 60) is proposed (#8 in Master Plan).

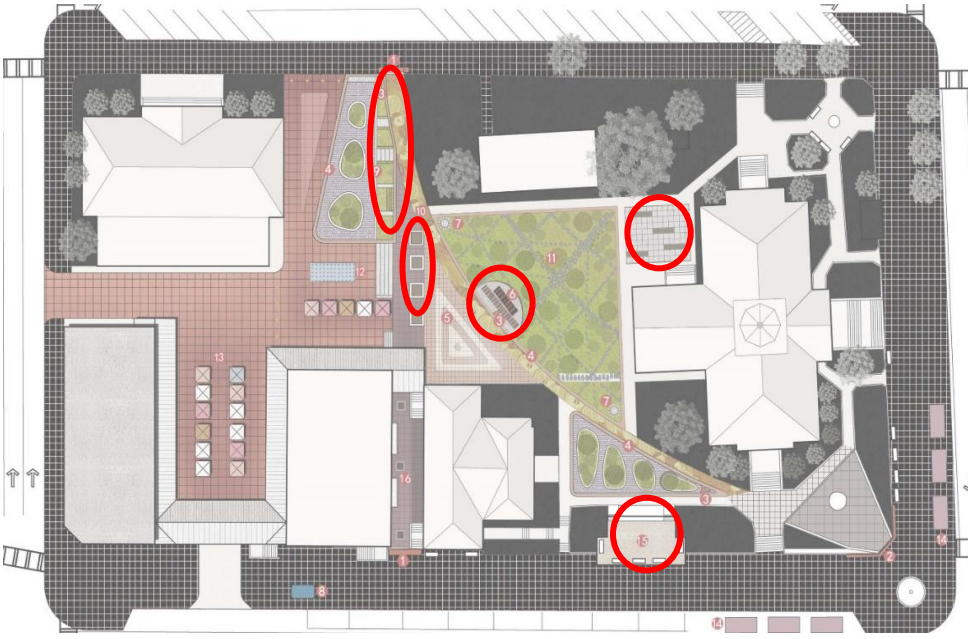


Figure 59. Seating Area Analysis. (Graphic by Author).

Figure 60. Public Restroom “Portland Loo”. (Photo from The Portland Loo Website).

Education: Overall signage is installed at spot #3 as shown in the Master Plan, and as previously stated, plant information signage is combined with food-finding signage installed besides planting materials. In addition, an educational site for children is proposed (#9 in Master Plan); the site will hold a high variety of edible plants. The plant information signage should be denser in this area, and overall educational signage can be installed along with the seating step (Figure 55).

Other Elements of Interest: The main pathway of the site will be proposed as the "art pathway" (#10 on Master Plan). Local artists or others could be invited to paint on the path, creating a visual attraction for visitors. A water splash pad is built besides the children education site (#12 in Master Plan) for kids to play inside. Also, buried logs and boulders, (#11 in Master Plan), will be installed in some areas to give children an opportunity to play and improve balance and the sense of nature. This design will adopt the idea of the Athens Downtown Master Plan 2030, propose a Festival Plaza (#13 on Master Plan) and build a shade area on surrounding buildings. This plaza could hold the Farmer's Market or other vending events. On the Southeast corner, the food trucks (#14 on Master Plan) will be proposed alongside pedestrian sidewalks; the number of the trucks and the operating time is flexible and based on the needs. The old bus station shelter (#15 on Master Plan) will be transformed into a coffee shop, and the surplus fruit in the site could be gathered and placed on its front door for passersby to pick up by free. The roof will be patio providing seating area. Based on the Athens Downtown Master Plan 2030, the alley (#16 on Master Plan) will be used for the outdoor seating area to serve the restaurant on its west side (Figure 61). Lights will be installed on top of the alley to create a visual attraction and sense of safety in this narrow space.

Figure 61. A, Alleyway (Before). (Photo by Author).

Figure 61. B, Alleyway (After). (Graphic from Athens Downtown Master Plan 2030).

Event and Programming:

The events and programming could follow the design guidelines given in the last chapter to organize activities and cooperate with related institutions in Athens, GA, such as Athens-Clark County Leisure Services, related NGO organizations, Athens Land Trust, and educational institutes, to organize public and group events on topics like volunteer work, food celebration, art and education. Moreover, the Athens Food Forest could cooperate with the University of Georgia's Horticulture, Agriculture or Art department, which could carry out horticulture and agriculture related studies or hold art exhibitions.

CHAPTER 5

CONCLUSION AND FURTHER RESEARCH

Conclusion

This thesis explores the relationship between urban food forests and the desire to create places for public participation. People living in cities commonly buy food in grocery stores; therefore, a disconnection exists with food production and the opportunity to participate in public food foraging is lost. On other hand, even though some public production landscapes have been built, the sites sometimes just serve certain particular groups or individuals for food production or educational goals; moreover, they lack of accessibility and opportunities for the general public to get involved in them and participate.

To solve these problems, in this thesis, by analyzing current successful urban food forest sites, the design and planning guidelines for public urban food forest are presented. By following these guidelines, designers will be able to create accessible well maintained public urban food forests. The sites will not just provide food production, but also provide a space for citizens to enjoy food forage, walk around, relax, and participate in fun events. By combining food with elements of urban public facilities, the designed functions for urban food forests will be suitable for a variety of users, whether gardeners or non-gardeners, used for food growing, as well as recreational and educational goals. With edible plants as a core, and facilities and programming as network, if it is possible to transform a simple food produce site to a successful multi-functional space that integrates the urban environment for citizens to enjoy.

Further Research

For the conceptual design of Athens City Hall Plaza in Chapter 4, the planting plan is lacking; thus, management should work with agriculture and horticulture experts to decide the choice of plant species that are suitable for the local weather, and the arrangements of plant materials that will meet the low maintenance and high production goals. Moreover, the design of the site facilities and amenities could be more detailed, such as the style of the pergola and tool storage, the design of the wayfinding signage and plant information signage, etc.

For the design guidelines, the three main cases and several additional cases presented in case studies should be followed up as the sites become more mature. Research could focus on what new facilities and programming have been added and weaknesses of each site. In addition, as new urban food forests are built, research could continue to collect new successful cases to further replenish and develop the design guidelines. Besides, studies could focus on which elements in the design guidelines are important, and if limited by funding, what should be built at the first phase of site construction.

In addition, the guidelines in this thesis are general ideas that are worth giving a try when designing urban food forest sites; however, this thesis does not specifically point out the most suitable types of site. For instance, the size, usage amount and usage conditions at parks, urban center plazas, community squares and street liner space are different, and not all elements in the guidelines are feasible or applicable to these sites. This concern needs further research and study.

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