

EQUAL ACCESS: PROVIDING URBAN AGRICULTURAL BENEFITS
TO UNDER-SERVED COMMUNITIES

by

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A THESIS

Presented to the Department of Landscape Architecture
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Master of Landscape Architecture

June 2012

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Degree awarded June 2012

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THESIS ABSTRACT

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June 2012

Title: Equal Access: Providing Urban Agricultural Benefits to Under-Served Communities

This study examines the potential contribution market research could make to planning urban farm locations. Substantial research identifies access to healthy foods as a significant barrier for under-served communities. Under-served communities are those struggling with food insecurity, poor nutrition and poor community cohesion. Urban farm locations could be more strategically planned to connect healthy food access and other secondary benefits to these vulnerable communities. This market research based methodology is applied to Portland, Oregon, using GIS data to map where future urban farms should be placed. The final product of this study is a prioritized list of potentially suitable sites in Portland, Oregon, for a future urban farm. This methodology could be applied in other urban areas to increase access to healthy foods among under-served communities.

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ACKNOWLEDGEMENTS

This research project would not have been possible without the generous contribution of time and attention from my committee members, Dr. Rob Ribe and Lorri Nelson. Additional guidance was provided in the development of this project by David Hulse, Bart Johnson and Liska Chan. The Department of Landscape Architecture faculty and staff have been incredibly supportive and encouraging throughout the process of completing this thesis.

My colleagues in the Masters of Landscape Architecture program have inspired my work for three colorful years. They have each left a mark on my education and helped steer this research project in a fulfilling direction. Their enthusiasm and moral support fed my determination to complete this project.

To the unsupervised, unruly, low-income children in my neighborhood, I reluctantly thank you. Their constant presence lurking around while I would write was a necessary reminder that we are not all given the same opportunities in life. This increased my desire to produce meaningful research to help connect them with healthy foods and the natural world. This access is needed to foster environmental stewardship.

Last, but never least, my family provided loving support every step of the way on this journey. Both near and far relatives helped me complete this project by holding an adorable baby, baking me brownies and scrubbing my kitchen floor. My husband and daughter were reminders that every day is a gift and life is much bigger than thesis work.

DEDICATION

To Juniper and Jay, my love and gratitude until the end of days.

A society grows great
when old men plant
trees whose shade they
know they will never sit in.
-Greek proverb

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CHAPTER I

AN OVERVIEW OF URBAN FARMING

The History of Urban Farming

Urban agriculture is the practice of producing food within an urban context. This broad definition includes many forms of production such as community garden plots, large urban farms, private kitchen gardens, rooftop food gardens, guerilla gardening in abandoned alleyways, and more.

Historically, urban agriculture has been an active component of many communities over time. Machu Picchu, the Pre-Columbian 15th century Inca city, provides a visually clear example of this with the use of agricultural terraces constructed alongside the built environment. These terraces likely provided efficient food production close to their place of consumption in a clustered community.

Monastic cloisters throughout Europe during the medieval period offer another example of historic urban agriculture. These self-sufficient, religious communities dedicated garden space within their walls for food production. These gardens were used to grow fruits and vegetables, medicinal herbs, and tend livestock (Horn 1000).

Today, many countries worldwide combine food production with urban living. Chickens and other livestock are raised in the city of eggs and meat. Rooftops and balconies hold collections of containers planted with vegetables. Urban residents terrace hillsides within walking distance of the large cities they call home.

In the United States, food production has often occurred within the bustle of an urban context. The earliest community gardens, for example, were created in the 1890s. “Phases of popularity include the vacant lot cultivation associations during the 1893-97

depression, the children's school garden movement from 1890 to 1920, civic gardening campaigns, World War I gardens, relief and subsistence garden programs during the 1930s depression, World War II victory gardens, and the current community gardening movement (Lawson 13).”

Wartime and periods of economic hardship often saw an increase in urban agricultural activity. However, gardening as both a leisure and food production activity has long been a popular tradition in the United States with or without hardship conditions. An indicator of this popularity can be seen through vegetable seed sales over time. Sales of seeds did not dramatically decline after the conclusion of the World War II victory garden movement. Instead, by the early 1950s there were still 17 million Americans still actively gardening – 33% of the non-farming population. Gardening also remains one of the most popular leisure activities in post-war America (Tucker 139).

Current Trends in Urban Agriculture

Over 80% of the total American population now lives in urban, metropolitan Areas (Cromartie). As the world population continues to increase and farmland is lost or depleted, there is a greater need to produce food to feed this urban community. Expanding the presence of urban agricultural systems in the United States has engaged many disciplines, including landscape architects, horticulturists, urban planners, environmental scientists, policy makers and others. All of these practitioners share a common desire to explore urban agriculture as a potential solution to the growing need for quality food supplies in urban areas.

Due to the broad nature of urban agriculture, several indicators can be analyzed to assess popularity and interest. Consumer interest in foods marketed as natural, organic or local is one indicator that can reflect the public's interest in consuming foods perceived as healthy in many ways. Outlets for purchase of these products, such as farmers market, can also be used as an indicator of the consumers desire to seek out and purchase fresh food. And finally, community gardens can be seen as an indicator of interest in the physical and social act of growing food in the city.

Consumer interest in natural food products has indeed seen an increase in the United States. According to a recent Mintel survey, “the NOFB [Natural and Organic Food and Beverage] market has done well in recent years, growing 20% between 2009 and 2011 at current prices, reflecting a market that is remarkably resilient in the face of continued economic stagnation that has limited growth in the food industry as a whole. (1)” These numbers will be investigated more thoroughly in the following chapter, but serve to illustrate that there is a growing interest in natural/organic food.

An indicator of consumers desire to seek out and purchase fresh food can be seen through the growing number of farmers markets. These markets have a long history in the United States, as either formal markets or roadside stands, that deliver fresh, locally produced food into urban areas. The United States Department of Agriculture, or USDA, began tracking the number of farmers markets back in 1994 through their Agricultural Marketing Service, commonly referred to as AMS.

Figure 1.1 illustrates the growth of these markets over time based on AMS statistics. As of 2011, approximately 7,175 farmers markets are in operation in the United States (“Farmers Markets and Local Food Marketing” 2). The AMS attributes the growth

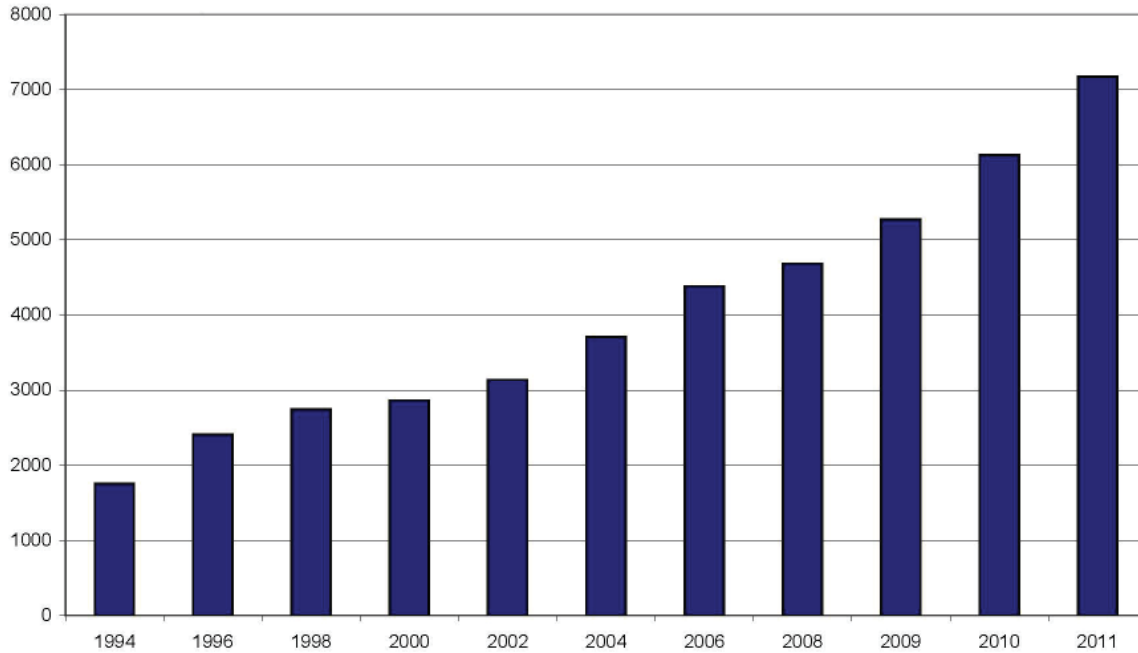


Figure 1.1: Growth of farmers markets

of these markets primarily in response to consumer desire for access to fresh food directly from the farm.

Community gardens, another facet of urban agriculture, have been growing in popularity over recent years and can be studied to determine general interest in growing fresh food in an urban context. According to the American Community Garden Association, there are over 18,000 community gardens currently throughout the United States and Canada. This represents the increasing interest by urban residents to produce food close to home.

An important trend to consider is the changing dynamics of farming in the United States. The number of American farms peaked in 1935 at 6.8 million (“Demographics”). The average farm fed 19 people. Since that time, the number of farms has decreased dra-

matically to 2.1 million while the national population has more than doubled. Today, the average farm feeds 136 people. (“Demographics”)

In addition to the overall number of farms, the average age of the American farmer has steadily increased over time. The current average age of a farmer is now 57 years (“2007 Census of Agriculture: Demographics”). These recent statistics illustrate the problem that current farmers are aging and there is a shortage of new, younger farms taking their place. As these older farmers retire, there may be social capacity challenges in meeting the need of the farming industry to provide food for our growing population.

Benefits of Urban Farming

Urban farming in this study is defined as an urban agricultural operation that produces a significant amount of food within urban contexts – enough to feed forty four-person families. They can operate at a variety of scales, but typically a farm would need to at least two acres to produce this amount of food. The Urban Farm at the University of Oregon is one example of a farm meeting these criteria in both acreage and production level.

Urban farms have been shown to offer a wide array of benefits to their customers. Customers are defined as people who visit the farm for either educational purposes, work opportunities or to purchase food. The benefits of urban farming can be summarized as follows:

“Locally grown foods support more people than imported foods, use less energy to grow and distribute, produce far less pollution, taste fresher, promote better

health, and encourage biodiversity (farmers growing for local markets, unlike monocrop farmers, produce a variety of foods)” (Grover 3).

Produce in the United States travels an average of 1,800 miles from farm to table (Grover 2). This creates considerable cost, carbon emissions and waste related to the packing and transportation needed for these goods. Local, urban farms can offer competitive pricing for their high-quality produce, often 30-40 percent cheaper than conglomerates (3). This is due to the reduced processing and transportation costs involved with local food production. Urban farms increase food security by making healthy food options affordable and potentially more reliable to neighborhoods and communities.

Urban farms often provide a variety of options for obtaining produce. This includes food-assistance programs, commonly referred to as “food stamps”, trading farm labor for farm produce and other arrangements. The overall lower cost of producing food locally and the flexible payment options offer increased opportunities for diverse community members to acquire healthy food options.

The United States is currently in the midst of an obesity epidemic. Approximately sixty-five percent of American adults are considered to be either overweight or obese (Hedley et al 2847). Nearly seventeen percent of children between the ages of 2-19 are considered obese (Ogden 1). This increases a number of a very serious health risks like developing heart conditions and Type II Diabetes (“The Surgeon General’s Vision for a Healthy and Fit Nation” 1).

The added risk to overweight children is their likelihood to remain obese and vulnerable to health setbacks in adulthood. “The probability of childhood obesity persist-

ing into adulthood is estimated to increase from approximately 20% at 4 years of age to approximately 80% by adolescence” (Pediatrics 425). Obesity, especially childhood obesity, is a wide spread issue, but certain populations are at higher risk. “Although rates of childhood obesity among the general population are alarmingly high, they are higher still in ethnic minority and low-income communities” (Kumanyika 187).

Urban farms offer multiple strategies for increasing community nutrition and potentially decreasing the risk of childhood obesity. In addition to providing a source of healthy foods, urban farms offer opportunities for gardening either through volunteer work hours or educational classes. “Practical experience with fresh food – growing, harvesting, identifying varieties in stores and farm stands, understanding seasonality, cooking, and preserving – positively impacts dietary habits” (Bellows 2).

Studies have shown that urban agriculture can contribute to increased community nutrition among adults (Freedman 22, Grenwal 2, Bellows 1) and preference among children for healthy food options (Parmer 216). Some urban farms are able to partner with local schools to provide healthy food options in the lunchroom. Teaching children in a hands-on environment to grow food increases their preference, even more for healthy food options (Parmer 216).

Some secondary benefits of urban farms include their ability to offer seasonal work and educational opportunities. In addition to customers exchanging labor for food, volunteers who offer labor also learn important farming skills that they can implement at home with their own garden (Bellows 10). Several urban farms offer summer internship positions. These positions may be available only to at-risk youth, people interested in a career in farming or open to the general public.

Another benefit of urban farms is their ability to contribute to a stronger local economy. Money spent on local urban agriculture “...stays in the community, cycling through to create jobs, raise incomes, and support farmers” (Halweil 16). This increases the self-reliance of a local economy as the demand and supply for food occur within the community itself. It also reduces cost fluctuations related to rising transportation costs from long-distance food suppliers.

Urban farm programs like Community Supported Agriculture, commonly referred to as CSAs, offer stability for the farmers. Customers commit to buying a portion, or share, of a farm’s produce for the growing season. The farmer can depend on a stable income for that year, regardless of whether it is a good or bad season for various crops. Customers are guaranteed a weekly delivery of fresh, local produce at reasonably competitive prices.

The agricultural industry is looking for solutions to bridge the generational gap in farming as an occupation in response to the increasing average age of the American farmer. The 2008 Farm Bill allocated \$18 million to educate emerging young farmers and ranchers (Raftery 19).

A recent New York Times article states that for these young farmers “...finding mentors has been difficult. There is a knowledge gap that has been referred to as “the lost generation” — people their parents’ age may farm but do not know how to grow food. The grandparent generation is no longer around to teach them” (Raftery 19).

Urban farming offers the opportunity to educate potential young farmers with little to no experience through apprentice and internship programs. This may allow young farmers to develop their production farming skills with mentorship and some might relo-

cate to rural areas to pursue farming full-time. In turn, the urban farm would be receiving valuable labor and management.

Many studies cite urban farming's ability to create stronger communities. Specifically, research has suggested that the presence of inner-city gardens can reduce crime (Armstrong 326, Bellows 8, Brown 28). Urban farms and other urban agricultural programs can also create new opportunities for community leadership development and organization (Armstrong 325, Brown 29). They can promote civic participation by working with various public agencies, planning departments and local politicians (Abi-Nader 7-8).

As the urban edges of cities have expanded, small farms that were once considered rural or semi-rural are now located within an urban context. A 1991 survey reported that 33% of American farms were located in metropolitan areas (Brown 20). Urban density is at the forefront of sustainable city planning. Nevertheless there are significant reasons to work toward balancing the increase of density with preservation of these historic farms.

Preservation of historic urban farms protects this increasingly scarce urban open space and promotes these farms as culturally-significant landscapes. Restoration of farming practices on these sites transforms them into a resource for local food production. The preservation and restoration of these farms can be done by transferring ownership of the land to an urban farming organization or by placing an agricultural easement on the property.

The strategic development of urban farms can further benefit communities by providing open green space. There is the potential for urban farms to be incorporated in city planning efforts of establishing green corridors for wildlife habitat. Urban farms can

also serve a similar function to public parks by providing opportunities to retreat from the urban environment, connecting with nature and as a recreational activity.

Challenges for Urban Farming

Despite the many benefits of urban farming, there are many challenges for the industry that are outside the scope of this research project. These challenges include the land tenure system, zoning codes, and the current Farm Bill. While this study addresses access issues in relation to urban farms, these additional challenges need consideration to ensure success for future urban farms.

The biggest recurring challenge for urban farms, and indeed many forms of urban agriculture, is wrestling with the land tenure system. Often urban farm programs are implemented in abandoned, vacant or otherwise forgotten corners of the city. It can be difficult to resist the financial incentive of using the land for development when this eventually becomes profitable.

Zoning codes are another potential barrier for urban farming organizations (Brown 29). Parcels zoned for urban land use are financially more valuable than rural land zoned for agriculture. This puts added pressure on urban farming organizations to become profitable quickly. Additionally, modifications to zoning codes may be needed to allow for certain agricultural activities to occur within the city.

Never in the history of the United States have Americans spent such a small percentage of their income on food. Figure 1.2 illustrates research from the USDA on the decline in American household spending on food for home consumption. This includes purchases from grocery stores and other retail outlets. In 1929, the average household

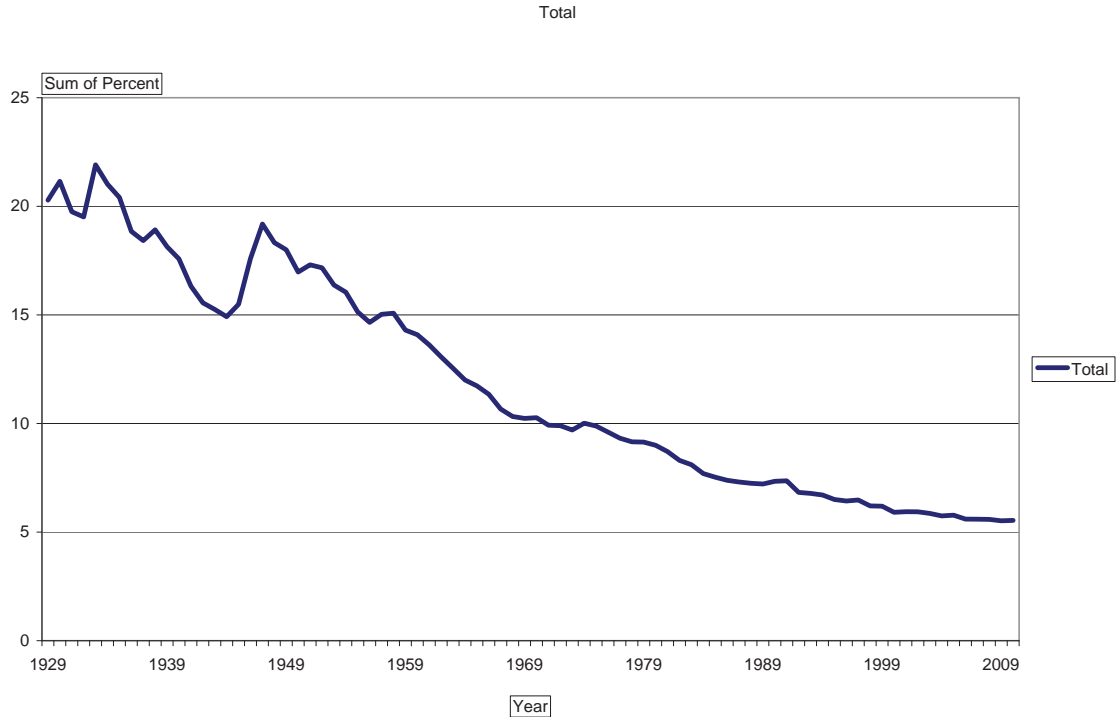


Figure 1.2: American household spending on food for home consumption.

spent 20.3 percent of its disposable income on food for consumption at home (“Food CPI and Expenditures”). As of 2010, only 5.5 percent of a household’s income is spent on food for home consumption. This drastic change over time has fostered a consumer expectation that food should not represent a significant portion of the household budget.

Another barrier for the success of urban farms is the United States Farm Bill. This complicated piece of legislation determines which food crops will be subsidized. These subsidies provide financial assistance to farms growing specific crops, namely to five major crops: corn, soybeans, wheat, rice and cotton. Although market prices may fall for these crops, farmers are ensured a certain sale price. The results have been mixed and hotly debated.

The surplus production has led to creative uses of these products, such as high fructose corn syrup:

“For the last several decades — indeed, for about as long as the American waistline has been ballooning — U.S. agricultural policy has been designed in such a way as to promote the overproduction of these five commodities, especially corn and soy... The reason the least healthful calories in the supermarket are the cheapest is that those are the ones the farm bill encourages farmers to grow” (Pollan).

Researchers have argued back and forth about the potential link between the current Farm Bill to the growing obesity epidemic. Regardless of a potential direct link to obesity, current legislation, and the expectation from American consumers that food should be cheap, poses major challenges for urban farming organizations to price themselves competitively. This puts urban farms at a disadvantage, and indeed any farm not growing these subsidized products.

Despite these significant challenges, urban farming and other urban agricultural activities have continued to gain traction with a diverse range of consumers. The following chapter will explore who is being currently served by urban farms and the potential for these farms to reach new consumers, specifically underserved communities.

CHAPTER II

THE CASE FOR STRATEGIC PLANNING AND REACHING UNDER-SERVED POPULATIONS

Need for Strategic Planning

Urban farm locations can often be determined based on reactionary methods. The farm organizers will commonly search for available or vacant urban land at a low sale price and choose to construct the farm at that location. Other factors that may weigh into the decision of locating the farm may be made based on the proximity to urban density, quality of farm soil, size of the land, and cost of acquiring the land. Equitable access to these urban farms tends often to be overlooked when locations are sought and selected.

Urban farms could improve access to healthy foods to under-served communities. The farms would do so by selling their goods at competitive prices, offering educational and work opportunities and functioning as vibrant and engaging community open spaces. This project intends to increase access to urban farms by under-served populations by offering a new methodology for selecting potential farm locations.

Under-served populations could benefit from having access to healthy foods to increase food security (Freedman 213, Grewal 2, Corrigan 1234), nutrition (Freedman 214, Drewnowski S36, Dubowitz et al 1890) and community cohesion (Armstrong 324-326, Grewal 2). Under-served populations in this study are defined as urban residents who are at highest risk for food insecurity, poor nutrition and living in areas which lack community cohesion. All three of these criteria must be met for a community to be considered under-served.

Numerous studies have shown that ready accessibility is a significant barrier for under-served populations to reach urban farms (Homeward Bound 1-3). Although there is desire to use urban farms, this community lacks the resources to travel far distances to reach them. Their limited access is derived from several factors, described below.

Under-served populations are commonly located within “food deserts”. This recently coined term is used to describe “inner-city urban areas with no green grocers or fresh-food options (Halweil 32).” These residents are therefore required to travel outside of their immediate community to access healthy food options. Under-served populations are therefore required to commit more time and resources to acquiring goods and services from urban farms.

There is also generally a relatively low rate of car ownership among under-served populations. While 96% of the general population uses an owned vehicle to purchase groceries, only 22% of food stamp recipients evidently drove their own car to purchase groceries (Homeward Bound 11).

The low rate of car ownership coupled with the presence of food deserts makes acquiring fresh foods a major undertaking. Residents may depend on public transportation, which increases their travel time, and may require walking significant distances with groceries in tow. This may include an additional cost for travel fare, which then reduces funds available for acquiring non-staple items like fruit and vegetables (Homeward Bound 11-12).

Many public and private organizations are seeking strategies to increase access among under-served communities to healthy food options. The federal Healthy Food Financing Initiative allocates \$400 million toward expanding healthy food options in

food deserts (Freedman 214). Farmers markets have intentionally been developed within under-served communities to improve access to healthy foods (Freedman 214). Additionally, farm-to-school programs are working to establish direct relationships with local farms to secure access to healthy foods (Bellows 9). “These programs reflect a grassroots endeavor by parents, teachers, school health officials, students, farmers, and others” (Bellows 9).

In addition to accessibility, several other factors affect the ability of under-served populations to consume healthy foods including availability and affordability (Freedman et al 213). This study will only investigate the issue of accessibility, but it is worth noting some of the on-going research being conducted related to these additional barriers.

The public sector is actively engaged in strategies to make healthy foods more affordable for low-income households. According to the United States Government Accountability Office, or US GAO, the federal government spends more than \$62.5 billion on food assistance programs to offset food costs for the low-income (2). The US GAO goes on to state:

“Research suggests that participation in 7 of the programs we reviewed—including WIC, the National School Lunch Program, the School Breakfast Program, and SNAP—is associated with positive health and nutrition outcomes consistent with programs’ goals, such as raising the level of nutrition among low-income households, safeguarding the health and wellbeing of the nation’s children, and strengthening the agricultural economy. (2)”

Additional public sector projects intend to make healthy foods more affordable to under-served communities. The Centers for Disease Control and Prevention has made

recommendations to increase the accessibility and affordability of healthy food as a strategy for reducing obesity. The Let's Move! campaign developed by First Lady Michele Obama is intended to increase accessibility and affordability of healthy foods to children.

The private sector has also conducted research studies and created programs to make healthy foods more affordable to under-served communities. One program provided vouchers to low-income women in Los Angeles, California, valid for purchasing fresh fruits and vegetables. The voucher program was successful in increasing the purchase and household consumption of these healthy foods among this population (Herman et al 740). Both farmers and community activists are actively engaged in developing strategies for making their produce more affordable to low-income communities through CSA shares (Fisher 34).

Other studies are exploring ways to increase the availability of healthy foods to under-served communities. A study among African American communities found that residents valued and used farmers markets when they were accessible in their communities (Suarez-Balcazar 5). However, the study determined that farmers at these markets were poorer. These financial constraints limited their farming capacity, so they were only able to sell produce at market during the summer months. This study recommended government subsidy programs be offered to these emerging farmers to increase the availability of their goods at the markets over more months of the year. (Suarez-Balcazar 6)

Improving access to urban farms among under-served populations with limited resources may increase their consumption of healthy foods and provide additional community cohesion. Identifying under-served populations in greatest need of an urban farm is the first step toward increasing equitable access of their resources.

Defining Risk

Among the many benefits urban farms can offer, this study focuses on three primary benefits: increasing nutrition, increasing food security and fostering stronger community cohesion. This project seeks to increase access of these benefits only among under-served populations who have poor community nutrition, high risk to food insecurity and lack community cohesion.

The operational mapping will use key criteria to identify under-served populations in need of an urban farm. Childhood obesity risk will be used as an indicator of poor nutrition. Low income levels will be used as the indicator of food insecurity risk. Crime rates and access to public spaces, such as parks, will be used to evaluate community cohesiveness. This section discusses each of these indicators in detail.

In part, the higher prevalence of childhood obesity among ethnic minorities and low-income communities is due to environmental factors such as the presence of “food deserts”. “Neighborhoods where low-income and minority children live typically have more fast-food restaurants and fewer vendors of healthful foods than do wealthier or predominantly white neighborhoods (Kumanyika 187).”

Many studies have suggested that obesity is an economic issue. The highest rates of obesity are linked to low economic status because high-energy, dense foods, often in the form of fats and sweets, are inexpensive. These low cost foods are also resilient to changes in the economy due to agricultural subsidies and other factors. When coupled with inequitable access to healthy food options, this puts lower socioeconomic groups at higher risk for poor nutrition. (Drewnowski S36).

High obesity rates are linked to low-income households and ethnic minorities (Kumanyika 188). Therefore, areas with a high percentage of low-income and ethnic minority households can be used as an indicator of the community's potential risk of poor nutrition.

The US Government Accountability Office, or US GAO, estimates seventeen million households, or approximately fifteen percent of the U.S. population, are considered to be suffering from food insecurity. The US GAO goes on to cite that US government spent over \$62.5 billion on food assistance programs in 2008. In over 4.3 million households, children were also affected by food insecurity. ("Domestic Food Assistance")

Populations at risk for food insecurity often share many traits with those at risk for poor nutrition. "Households with incomes below the poverty line, households headed by single parents, minority households, and those with children had higher than average rates of food insecurity ("Domestic Food Assistance")." Based on these statistics, this study will use low income status as an indicator to determine and map populations at risk for food insecurity.

Communities that lack community cohesion can benefit from the presence of urban farms. Research has shown a positive correlation between the presence of urban gardens and a decrease in crime (Bellows 8, Armstrong 326). Therefore, neighborhoods with high crime rates will be used as an indicator of communities lacking cohesion.

Positive social spaces are safe, open areas that encourage interaction among neighbors, function as community gathering spaces and provide the opportunity for visitors to connect with nature. Urban farms have the ability to act as a positive social space for under-served communities. They can function as centers for community organization

and catalysts for change (Armstrong 325). Neighborhoods that lack access to public parks will also be considered a rough indicator of communities lacking cohesion.

An Untapped Market

Under-served communities both need and would actively use an urban farm for purchasing food, participating in the cultivation of food, and using the farm as a social gathering space. The desire to use an urban farm for purchasing food can be seen through the successful use of farmers markets by under-served communities (Freeman 214-222). The desire to use an urban farm for the purpose of participating in the cultivation of food can be indicated by the use of community gardens (Armstrong 322-326). Studies demonstrating the use of farmers markets and community gardens among this population, along with their use as social gathering spaces, are described below.

The Veggie Project is one example of a successful farmers market program targeted toward under-served communities. “The combination of on-site farmers’ markets at Boys and Girls Clubs, a financial voucher program (the Super Shopper Program), and a youth education and leadership program (the Youth Leader Board) made fruits and vegetables more accessible to the target population” (Freedman 221).

A survey among community gardeners in New York was conducted to study the benefits and motivations of community garden participation. In this study, low-income urban residents cited “access to fresh/better tasting food” as one of the primary motivators for their participation in community gardening (Armstrong 322). Table 2.1 lists additional factors that influenced participation in urban community gardens.

Table 2.1: Reasons for participating in urban community gardens (Armstrong, 323)

Reason	Yes	No
Fresh food is/tastes better	93%	7%
Enjoy nature/open space	87%	13%
Some activities done cooperatively by gardeners	87%	11%
Mental health benefits	80%	20%
Exercise	67%	33%
Good family/children's activity	67%	33%
Healthy activity	67%	33%
Food source for low income households	60%	30%
Tradition cultural practice	47%	53%
Income supplement (from sale of foods grown)	7%	93%

Armstrong goes on to report that community gardens located in low income areas raised the attitude of residents toward their neighborhoods (324). The gardens acted as a catalyst for other neighborhood improvements, such as property improvements, reduced littering and increased community pride (325). Low income residents were actively using the community gardens and valued the contribution these gardens made to their neighborhoods.

“Reports find that low income communities particularly value the community-building benefits of urban agriculture (Bellows 8).” The study of New York community gardens demonstrated that gardens function as productive social space in low income areas. They improved social networks and became the center for neighborhood organization (Armstrong 325). This demonstrates the ability of urban gardens to bolster community cohesion among under served populations.

Under-served populations across the country are not merely waiting for assistance to be provided to them by outside organizations. In many cases, the communities them-

selves are creating grassroots movements to bring healthy food options into their neighborhoods. Growing Power is one example from Wisconsin of a grassroots effort to provide healthy food options in an under-served community. Will Allen began the program in 1993 in a northern Milwaukee neighborhood that he describes as a food desert. The farm employs a diverse range of people who all live in the neighborhood, from teenagers to seniors. Growing Power produces thousands of pounds of fresh food on two acres which is sold at the farm and distributed through farm baskets around the community (Bybee).

According to Executive Director Allen, “If people can grow safe, healthy, affordable food, if they have access to land and clean water, this is transformative on every level in a community. I believe we cannot have healthy communities without a healthy food system” (Growing Power). He has since been named a John D. and Katherine T. McArthur Foundation Fellow, a member of the Clinton Global Initiative, participant in First Lady Michelle Obama’s “Let’s Move!” program to reduce childhood obesity, and named among the 100 World’s Most Influential People by Time magazine (Growing Power).

On a smaller scale, Growing Gardens is a Portland non-profit program that helps low-income residents learn to grow their own produce. The program began in 1996 with a mission to combat hunger in under-served communities and has helped over 900 Portland residents establish organic food gardens (Law). Participants are enrolled in the program for three years and receive seeds, plant starts, help constructing vegetable beds and mentorship as they learn to grow their own food. (Growing Gardens)

In summary, members of under-served communities want and will use resources that increase their access to healthy food options. This is evident through their participa-

tion in community garden programs (Armstrong 322-326), federal food assistance initiatives (“Farmers Market Nutrition Programs”) and through the many grassroots urban agriculture programs that have grown across the country (Growing Power, Growing Gardens). This engagement may well grow over time to serve more and more people. The following chapter proposes a market-research based methodology for connecting underserved populations to urban farms as a way of increasing access to healthy food options.

CHAPTER III

SOLUTION: APPLYING MARKET RESEARCH TO URBAN FARMING

Overview of Market Research

For the purposes of this project, market research is defined as “the systematic collection, analysis, and interpretation of information relevant to marketing decisions” (Hague et al 11). The information gathered through market research can help companies understand their potential market size, consumer opinions about their products, customer satisfaction, and identify new and existing consumer market segments.

Many business decisions are made purely on intuition that has been honed through experience and known information. However, when decisions have major financial risk or other high costs associated to failure, market research can be a valuable tool for reducing risks. New business strategies must often confront existing biases to either prove or disprove them as bias or factual information. In these cases as well, market research can help estimate the likely potential of certain business moves. Simply put, “the purpose of market research is to reduce business risk” (Hague et al 2).

Market research in the United States began back in the 1930s as large corporations began experimenting with observing customer behavior and auditing inventory. The Nielsen Company emerged during this time, which is still one of the largest consumer research companies worldwide. Companies began to gain insight into sales data, market size, product trends and competitor shares of a market and these helped executives make smarter decisions about growing or changing their businesses. (Hague et al 2-3)

In the 1950s and 1960s, market research evolved further to include new methods like sample surveys that used questionnaires to determine customer attitudes. These

methods were modified in the 1970s and 1980s to investigate consumer satisfaction as well as attitudes about products and services. (Hague et al 2-3)

Today's market research can include a number of different methods to provide insights, which will vary based on the goal of the market research and other factors like time and budget constraints. Generally they are divided into two main categories: qualitative and quantitative methods.

Qualitative methods focus more on understanding the perceptions and motivations of a target audience. A market research project may focus on understanding why customers prefer one product over another or whether their needs are being met by a given service. Typically these methods are executed by sampling a small number of people from a larger population. Methods for qualitative research can include in-depth interviewing of sample subjects, conducting focus groups, and observing customer behavior. (Hague et al 8-11)

Quantitative methods are more concerned with more valid and reliable measurement, often done through rigorous sampling. The objectives for this type of market research may be to measure the size of a potential market, estimate demand curves, the size of various market segments, the frequency of purchases, or levels of awareness about a company's products or services. The range of quantitative methods includes brief surveys, compiling existing published market research such as census data, relating these first two methods, other desktop research like general market trends and other more intensive methods. (Hague et al 8-11)

Generally, the use of quantitative and qualitative research methods can be complementary. It is common for a given research design to include both in order to create a

more comprehensive analysis. The qualitative portion may show consumers feel an area of service is lacking, while the quantitative portion provides hard data that can lead to specific recommendations. (Hague et al 8-11)

Why Urban Farming Needs Market Research

As discussed in Chapter II, urban farms can benefit from a more strategic planning process when their locations are being determined. This project intends to increase access to urban farms among under-served communities. Market research is the methodology applied to this problem.

The most fundamental principles of market research involve obtaining a thorough understanding of the industry, the business competition and the desired target audience as it relates to the business. This information is often known by most urban farming organizations, but they may not understand how to structure this knowledge for use in business decisions. Following a market research approach to planning can help provide a framework for urban farms to make smarter, long-term decisions that will reduce their business risk.

In the case of neighborhood farming, urban agriculture should be considered the relevant industry. Other neighborhood farming organizations are direct competitors. As discussed in Chapter II, under-served populations who are at high risk for insecurity, poor nutrition and lack community cohesion are a valid socially-constructive potential market for urban farms. Therefore, for the purposes of this project, the desired target audience is under-served populations.

Urban agriculture as an industry includes any organization with both substantial food production and educational opportunities. This study defines substantial production as farming at least two acres of land – a large enough size to intensively farm for food production. Educational opportunities can be for children, adults or any combination of age groups. Urban is defined as the organization both producing food and offering educational opportunities within the city limits.

This definition of industry can encompass farmers markets who provide food for sale in urban areas. Organizations that farm on multiple small lots can also be included if their total farmed land size is at least two acres. And finally, other neighborhood farms with substantial production and educational opportunities are considered part of this related industry.

Each facet of this industry offers a different array of benefits and challenges to the local foodshed. A foodshed is defined as “a geographic area that supplies a population center with food” (“Local Foodshed Mapping Tool”). Understanding the role of these various players in the urban agriculture industry will provide insight into areas of opportunity for future neighborhood farms.

In this study, only other urban farms in a shared urban area are seen as direct competition for future urban farms. Urban farms offer the combination of food for purchase, educational opportunities and public open space for community gathering. This study focuses on these three primary benefits to potentially offset food insecurity, poor nutrition and poor community cohesion. Other avenues may exist for purchasing local food, such as farmers markets and natural food stores. While they may compete for food sales with

urban farms, they cannot provide the public open space and educational opportunities of an urban farm.

Market research can enable more strategic planning to complement, rather than impede, the efforts of multiple neighborhood farms. Understanding direct competition in a market can help future urban farms position themselves in an area with potential consumers whose needs are not currently being met by an existing urban farm.

Application to the Urban Farming Industry

The Ansoff Matrix (Figure 3.1), originally published in the Harvard Business Review back in 1957, is still used today as a guide to market research and developing business strategies. The matrix demonstrates strategies for growing a business based on whether the market is new or existing and whether the products being offered are new or existing. (Hague et al 4)

Like many other industries, we can apply this matrix for use in this project. We can consider a future urban farm as a new product being offered in a new market. In this

New Products	Market research can show the likelihood of adoption of new products	Market research can show unmet needs and provide an understanding of unfamiliar markets
Existing Products	Market research can measure customer satisfaction to find out how to maintain a competitive edge	Market research can find new territories for products or services
	Existing Markets	New Markets

Figure 3.1: Ansoff Matrix (Hague et al, 4)

instance, the market research would “show unmet needs and provide an understanding of unfamiliar markets” (Hague et al 4).

We could also apply this matrix to the problem of an existing urban farm that may be opening a new farm location in a new area. In this case, there would be an existing product that is now offered in a new market. Market research would be aiming to “find new territories for products of services” (Hague et al 4).

It is also important to consider the overall industry of urban farms in relation to their lifecycle to gain further insight into the potential benefits of market research. Figure 3.2 is a representation of life cycle stages defined by Theodore Levitt (Hague et al 5). Levitt was a professor at the Harvard Business School and his published work “can be seen as a turning point in the acceptance and respectability of marketing” (“Guru: Theodore Levitt”).

Although urban farming has a significant and lengthy history, the increased popularity of urban agriculture in the form of CSA offerings, farmers markets, etc. is fairly recent. Therefore, this portion of the industry can be considered young and growing. According to the Levitt lifecycle, market research would “explore the unmet needs for the new product and [help] estimate the likely demand. It could be used to set prices and shape the specification of the product” (Hague et al 5).

The “product” could range from what educational opportunities are offered to what types of fruits and vegetables are grown. Although not the goal of this study, additional market research studies could help urban farms determine how to price their CSA shares or what portion of the CSA shares need to be available for purchase through food

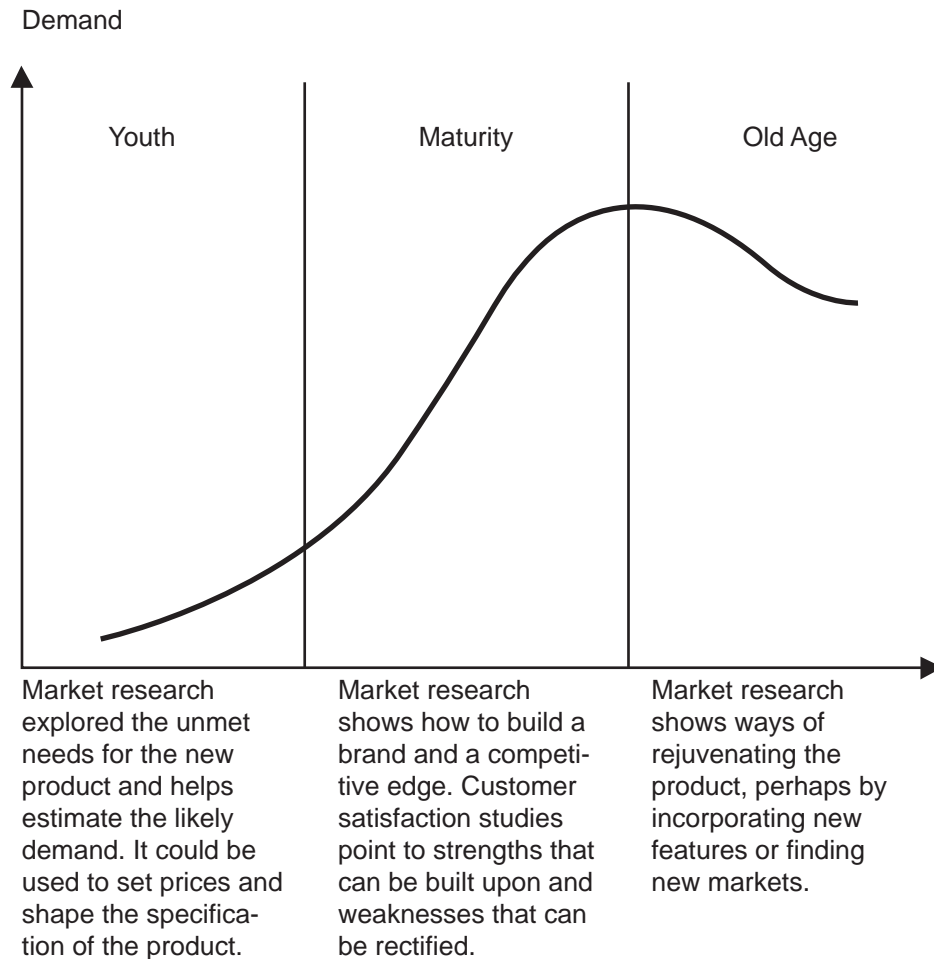


Figure 3.2: Levitt product and service life cycle (Hague et al, 5)

stamp programs. Furthermore, market research could help urban farms decide how to promote themselves and to what target audience.

Market Research Design: Defining a Process

Successful market research often begins with a clear, thoughtfully planned research design process. This market research design will clearly define the scope of the research, goals and objectives, the process of gathering data and how that data will be analyzed.

As outlined by Hague et al, the seven major components of this design are illustrated in Figure 3.3 (12). Brief paraphrased descriptions of each component's role are as follows:

1. Brief: provides background of the situation, describes what information is required, and defines the goals and objectives
2. Proposal: describes the plan for satisfying the objectives and outlines how information will be gathered
3. Commission: the contract between research agency and client (Not included in the research process for this study)
4. Qualitative: field data collected
5. Quantitative: data collected via fieldwork and/or desktop research
6. Analysis: interprets the collected data
7. Reporting: presents the findings and makes recommendations

The project brief is perhaps the most crucial component of a strong market research design. It acts as a roadmap for the market research project – showing where the beginning point is and where the project will end. It should explain relevant background information and clearly address why the market research is needed. This section identifies the current problems and opportunities, target audience, and information needed. Additionally, if a third party research agency is being used, this section should include their proposed budget, timing and reporting requirements. (Hague et al 11-13)

The proposal portion of the design should clearly state the overall goals of the research project. It will further break the goal down into objectives for the research to

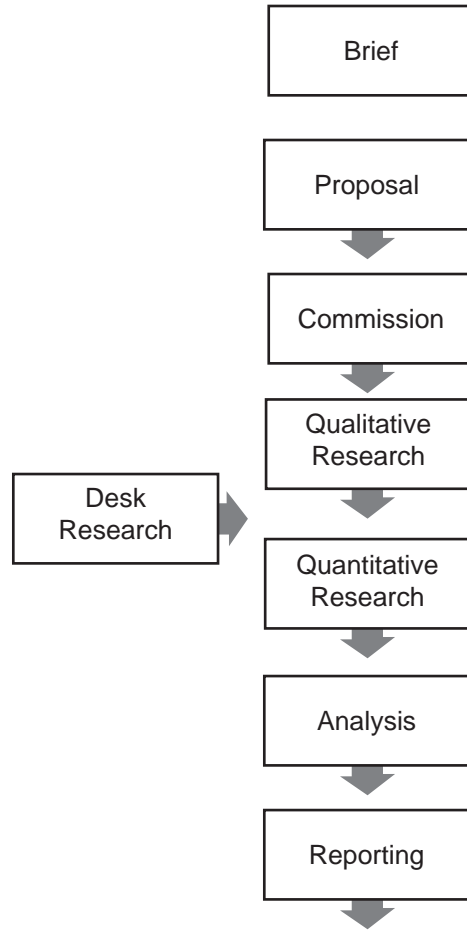


Figure 3.3: Market research process (Hague et al, 12)

achieve. This section should outline the methods that will be used to gather research information. And finally, this portion of the design will discuss the actual timing and costs of performing the research. (Hague et al 11-13)

The commission section is essentially the contract between the company requesting the research and the third-party research agency. For use in this adaptation, a commission section is not relevant. In practice, an urban farm organization may conduct their own research and this section may not then be needed. (Hague et al 11-13)

The information to follow these early, foundational sections will be the data collection portion of the research process. This will include both the qualitative and quantita-

tive data that was conducted, as outlined earlier in the proposal section's methodology. The qualitative data can include in-depth interviews, focus groups, observation/behavior studies, etc. The quantitative data can include surveys, statistics and desktop research such as previously published reports relevant to the project. (Hague et al 11-13)

Analyzing the data collected during fieldwork is intended to look for patterns of response among the data to draw conclusions. For quantitative data, cross tabulation is often used to analyze the data. Proprietary, costly software programs are used to conduct robust analysis. Simpler analysis can be done by the researcher using spreadsheets to synthesize data. Qualitative data analysis is often done by the researcher who collected the initial data – i.e. the facilitator of the interviews or focus groups. Data analysis is often as much of an art as a science. It requires careful and detailed attention by the researcher to pull out conclusions. (Hague et al 11-13)

Finally, the reporting section should clearly explain the findings from the research process. This section will present the conclusions from the data analysis and make recommendations to address research goals. The use of text, graphs, charts, and diagrams will be needed for a successful and comprehensive report. Often this report is passed along to others, so it must act as a standalone piece that does not require the researcher to be present to explain. (Hague et al 11-13)

The following chapter will apply the relevant components of this market research design process to this particular project: determining a new location for a future urban farm in Portland, Oregon. The report component of the next chapter will identify potential locations for future urban farms.

CHAPTER IV
APPLYING MARKET RESEARCH TO LOCATING A NEW URBAN FARM IN
PORTLAND

Why Portland?

New industries entering a market will traditionally recruit a customer base from the people most likely to adopt their goods and services. In this case, an urban area without existing urban farms would need to pursue potential consumers that have the most interest in local food, urban agriculture and sustainable living. These would be their primary target audience and the most likely to adopt their goods and services.

This study intends to expand the existing industry of urban farming to reach a new customer base. This new customer base seeks to engage new customers, namely underserved populations most in need of the goods and services from urban farming. Therefore, the application of this methodology has chosen to occur in an urban area with an established urban farming industry.

Portland, Oregon, is a good test market for this application because it has a strong, existing base of local food and urban agricultural activity. This market has already accessed consumers who have the most interest in local food and urban agriculture. Several indicators demonstrate that this consumer base is actively participating in existing opportunities to engage in local food and urban agriculture as described below.

SustainLane ranked Portland as the most sustainable US city based on a number of criteria, including access to local food and agriculture. The metric of local food and agriculture was determined from the following criteria:

“Number of community gardens and number of farmers markets per city, with additional credit given to those farmers markets accepting WIC (women, infant, children) and food stamps. This data came from both NGOs and the US Department of Agriculture, as well as from cities themselves. Cities and/or NGOs provided the number of community gardens per city. Farmers markets were weighted by the number of each city’s markets accepting food stamps and WIC credits” (“The SustainLane Methodology”).

As ranked by these criteria, Portland has an active and growing farmers market network throughout the metropolitan region. In 2007, fourteen markets were operating within the city of Portland with an additional twenty-two markets in the surrounding metro area. Over \$11.2 million in sales were generated from the fourteen Portland markets. The markets are estimated to have a \$17 million impact on the regions local economy. (Barney 3)

Portland has strong network of natural grocery stores, another indicator of community interest in local food. Large natural grocery stores include Zupan’s Market, New Seasons Market, and Whole Foods – each with multiple locations throughout the metro region.

Finally, there is an existing network of urban farms in the city of Portland including Zenger Farm, 47th Avenue Farm, Tryon Creek Community Farm, and the Oregon Food Bank’s Learning Garden. New urban farm organizations, such as Garden Partners, are currently looking for locations in Portland for future farming operations (Garden Partners).

These factors indicate that Portland has a strong, existing base of local food and urban agricultural activity. There is an opportunity in Portland to expand urban farming to a new customer base that connects urban farms with under-served populations most in need of their goods and services. The following section outlines a market research process to determine future locations for urban farms that increase access to local food among under-served communities.

Market Research Process

Brief

The Portland alternative food market currently supports several urban farms, but opportunities exist for additional urban farms to enter the market to reach new consumers. This research process defines new consumers that are in under-served communities who do not currently have access to an urban farm. Under-served communities are considered those that meet the three criteria of being at high risk for food insecurity, poor nutrition and lacking community cohesion.

The goal of this market research process is to increase access among under-served communities to urban farms in Portland. This process will determine which under-served communities in Portland have access to existing urban farms and identify areas lacking access. The final product of this process will be a map that shows where future urban farms should be located to increase access for this new customer base of under-served communities.

Farms located within the city of Portland provide fewer access barriers to urban residents than farms in rural or suburban areas. It takes less time to drive to an urban farm

than one located outside the city. There are also more alternative transportation options for travel within the city, such as public transportation, bicycling or walking. Therefore, those with limited resources would likely find farms within the city of Portland easier to access.

Urban farms need to produce a substantial amount of food to be considered direct competition for a future urban farm, in this case enough to supply forty CSA shares. The method of charting production varies from one farm to another, with some not charting their production at all. This research makes the assumption that producing enough food to supply forty CSA shares qualifies a farm as large-scale urban agriculture. An average CSA share is assumed to feed a family of four. A farm may not offer CSA shares and instead sell at a farmers market or distribute to the needy at no cost. However, they must have the capability to support forty four person families.

Educational opportunities offered by urban farms enrich the community by creating opportunities for interaction among neighbors and connecting to nature. Educational opportunities on urban farms can include hosting school groups, adult learning classes, farm apprenticeships and more. Urban farms in this study must offer educational opportunities to adults, children or both to be considered direct competition for a future urban farm.

Several urban farms operate in Portland at a variety of production scales – from small residential gardens to multi-acre farms. These existing urban farms are considered direct competition for new urban farms if they meet all of the following criteria summarized below:

- Farm located within the city of Portland
- Produces food for at least forty CSA shares
- Offers educational opportunities

An inventory of the city of Portland market of urban farms determined that four urban farms meet these criteria (LocalHarvest). They are outlined in Table 4.1 and will be included in the research process.

The current urban farm locations are scattered throughout Portland, as seen Figure 4.1. This study makes the assumption that customers are coming from neighborhoods in

Figure 4.1: Competitive Portland urban farm map

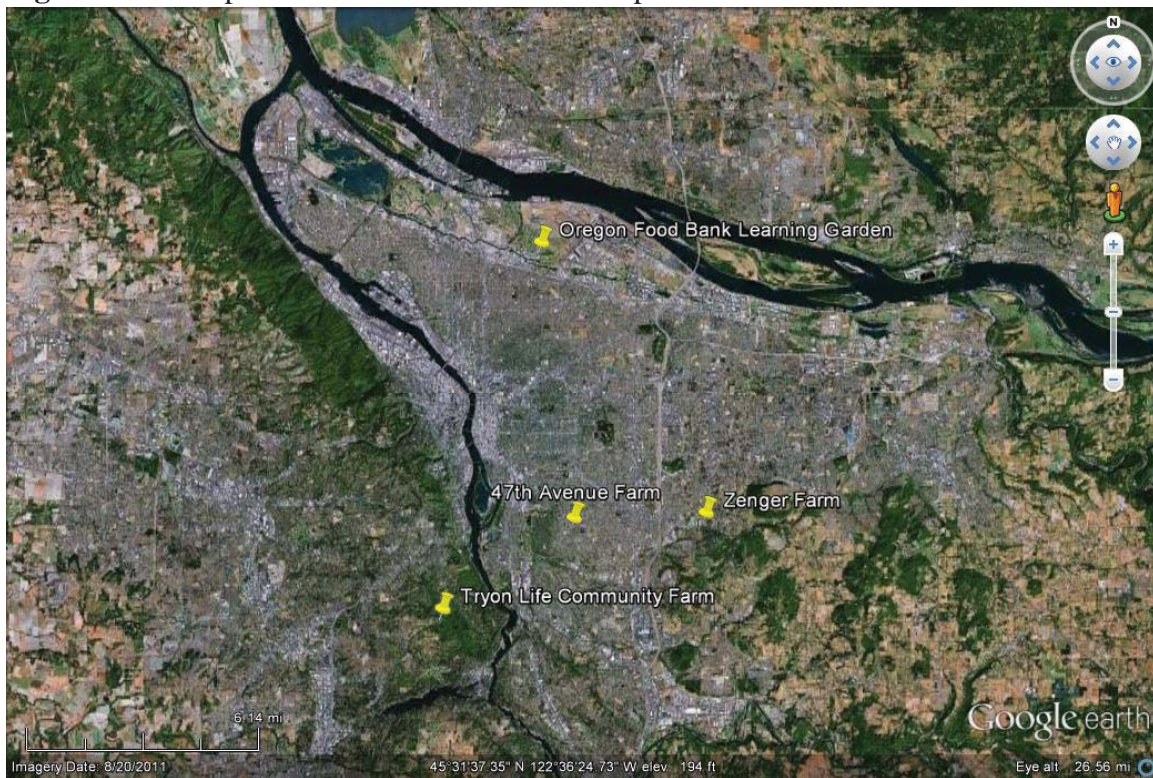


Table 4.1: Competitive Portland urban farms.

Organization	Established	Size	Range of products	Education Components	Distribution	Alternative Pricing
Tryon Creek Community Farm	2004	2.5 farmed	vegetables, fruit, dairy goats, chickens, sheep	Hands-on Sustainability Education Program, summer camps, community workshops, permaculture certification, mother earth school (kindergarten), volunteer work parties	Unknown	Work-trade
Zenger Farm	1995	6 acres farmed	vegetables, fruit, bees, chickens, worms, turkeys	field trips, summer camps, comm wksp, healthy eating on a budget	CSA Shares (40), Lents Farmers Market, direct to restaurants	EBT Accepted, scholarships for CSA shares
47th Avenue Farm	1996	14 acres farmed	vegetables, fruit	Apprentice program, volunteer work parties, school field trips	CSA Shares (135)	Work-trade discount on CSA shares
Oregon Food Bank Learning Garden	2009	Unknown	vegetables, fruit	School field trips, volunteer work parties, community workshops, adult education	Direct to family in need via the food bank	Produce not sold

close proximity to the farms. This creates an opportunity for future urban farms to service many other parts of the city that are not within close proximity to current farms.

Future urban farms will need to compete with current farms for resources, such as charitable donations, city funding, growing spaces and community volunteers. Many current urban farms operate on land owned by the city. Public funds are limited and may make new land acquisitions challenging in a city of high land values. Future urban farms may not have a large range of land options available for leasing or purchase from the city or private owners.

Despite these challenges, the popularity and produce sales from existing urban farms in the city of Portland indicate there is opportunity for more urban farms to be successful. The existing urban farms that offer CSA shares sell out each season. The farms that sell through farmers markets are unable to expand to other farmers markets because they cannot produce more goods for sale. Farms that offer apprenticeships receive more applications than they have positions to fill. Nearby schools are visiting existing urban farms on field trips, but many schools in the market are unable to visit an urban farm due to distance.

The goal for this research project is to increase access to urban farms among under-served communities in Portland. As discussed in earlier chapters, increasing access to urban farms has the potential to increase food security, community nutrition and neighborhood cohesion.

Proposal/Strategy

The research methodology is divided into two major phases. The first phase determines which neighborhoods of Portland are in need of increased access to an urban farm. The neighborhoods will be ranked in terms of priority. The second phase identifies potentially suitable sites for future urban farms within the neighborhoods in need of increased urban farm access. These suitable sites will be prioritized based on their potential to function as an urban farm. An overview of this methodology is diagrammed in Figure 4.2.

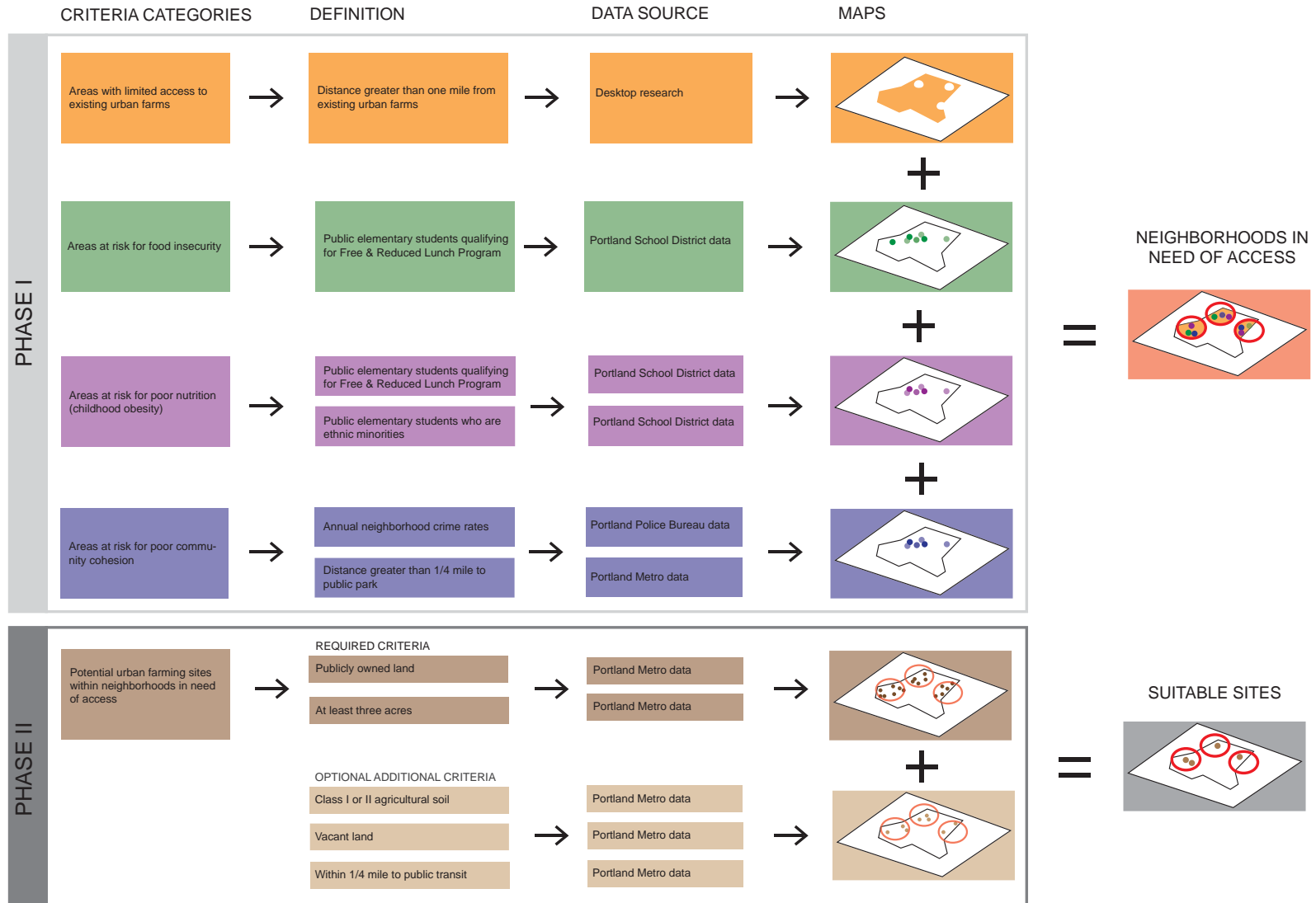
The first phase in this analysis begins by identifying areas with limited access to existing urban farms. The locations of current urban farm organizations and their service range are mapped. The assumed service range is within one mile of the urban farm. This distance is accessible by walking for a variety of ability levels – approximately a 30 minute walk. Areas within this distance are assumed to have good access to urban farms. Areas outside of this service area are assumed to be lacking good access to an urban farm.

Phase I continues by identifying areas of Portland that are at risk for food insecurity, poor nutrition and poor community cohesion. These are the three indicators of underserved communities in this study.

A composite map is created based on the following maps: areas with limited access to existing urban farms, high risk of food insecurity, high risk for poor nutrition and high risk for poor community cohesion. This composite map identifies and ranks neighborhoods with the greatest need for increased access to an urban farm.

The second phase of this study identifies potentially suitable sites for an urban farm. This phase identifies a criteria set of attributes that makes a good urban farm. These

Figure 4.2: Project methodology.



attributes are mapped in the neighborhoods with greatest need for increased access to an urban farm.

The final product of this study is a map showing areas in most need of increased access to an urban farm and potential sites within those areas that could become urban farms.

Data Collection

This analysis investigates information at the neighborhood scale, which vary in acreage but typically consist of an average 2,029 households (Great – Guidelines Review Committee Meeting). There are ample GIS and other public data sources available at the neighborhood scale in Portland. A larger scale would likely not allow for identification of specific sites. A smaller scale would not be possible with existing resolution of public data. This would require additional data to be collected and compiled, which could then become time and labor-prohibitive to conduct the study and might not yield better results.

As discussed in earlier chapters, conceptual indicators of need are communities with a high risk of food insecurity, poor nutrition and lacking community cohesion. Each of these indicators has corresponding operational criterion or criteria that are assessed to determine each neighborhood's need.

Phase I: Neighborhoods In Need of Access

As described earlier, existing urban farms are mapped to identify communities that do not have good access to an urban farm. Urban farms are identified through desk-top research (“A Century Old Working Urban Farm”, “How the Farm Works”, “Learning Gardens”, Local Harvest). A service area is mapped around these existing farms as

conjectured as their service area. One mile is an approximately thirty minute walk, which is considered in this study as a reasonable distance for occasional trips to the farm. Areas outside of this radius are considered lacking good access to an existing urban farm. These areas without good access are opportunity areas for a future urban farm to reach new customers.

The highest risk for food insecurity is in low income households. To determine household income, this study will use public data available from the five school districts in the city of Portland (OSBA: Districts). This data shows the percentage of elementary students who qualify for the free and reduced lunch program. When an elementary school is not present in a neighborhood, data from the closest elementary school will be used.

The free and reduced lunch program is a federal program that provides cash subsidies from the USDA for eligible school children. Eligibility for this program is based on household income, with low income households qualifying for the program. Low income is determined by the USDA to be household incomes at or below 185 percent of the poverty line (Program Fact Sheet). The criterion for determining high risk for food insecurity is having a high percentage of students qualifying for this program.

Poor nutrition in this study focuses on high risk for childhood obesity. As discussed in previous chapters, ethnic minorities and low income households are at highest risk. Public data from the five school districts in the city of Portland summarize the percentage of elementary students by ethnicity (OSBA: Districts). When an elementary school is not present in a neighborhood, data from the closest elementary school will be used. Ethnic minorities for this application are considered any non-white race. This

includes Hispanic, African American, Asian and/or Pacific Islander, Native American/Alaskan Native and multiple ethnicities.

Both ethnicity and free & reduced lunch program data will be used as criteria for showing risk levels for poor nutrition. Each of these two criteria is given equal weighting when determining community nutrition.

Neighborhood cohesion will be assessed through analysis of crime rates and presence of public parks. Crime statistics are available from the Portland Police Bureau via their public CrimeStats resource (“CrimeStats”). This market assessment will consider the total number of reported crime incidents by neighborhood, which includes both violent and non-violent crimes.

Public park locations will be gathered from existing Metro data (Portland Metro’s Regional Land Information System). Areas within ½ mile of a public park are determined to have adequate access. This study does not factor in how well used a public park may be. This is roughly a fifteen minute walk which is assumed in this study to be a reasonably accessible distance for a range of abilities.

The quality of the public parks will not be a factor in this assessment. For example, the neighborhood may have good access to a public park, but the park may not be well-used for various reasons. However, the presence of the park represents the potential for the community to have good cohesion. The community may decide to redesign or update the park to better serve the community. The land use has already been established, though, and is therefore easier to transform into a community gathering space than a neighborhood without an existing public park.

Both crime rates and access to public parks will be used as the criteria to determine the level of community cohesion by neighborhood. The two criteria are given equal weighting when assessing a neighborhood's community cohesion level.

The criteria of risk for food insecurity, poor nutrition and community cohesion as assigned a value range of 1-5, with one signifying low risk and five signifying high risk. When multiple criteria exist for an indicator, each criterion is given equally weighting. Criteria will be totaled for each indicator to determine the areas of risk. The values of the three indicators will then be totaled to produce an overall score that reflects the overall need of an urban farm resource by neighborhood. In this study, the three indicators are given even weight when determining where under-served communities are living.

The three criteria maps of food insecurity, poor nutrition and poor community cohesion are combined with the map of areas with limited access to existing urban farms. This creates a composite map that illustrates neighborhoods in need of increased access to an urban farm.

Phase II: Suitable Sites

The following is a list of criteria used to determine where vacant/available land parcels may be suitable for large-scale urban farming. Two criteria must be met for the site to be considered suitable for farming:

- site is publicly owned
- site is at least three acres.

The majority of urban farms operating in Portland are owned by the city. Therefore, land already in public ownership may be easier to transition into farming when

leased by the urban farming organization. This criterion must be met for this study to consider it a suitable site for an urban farm.

Land in private ownership could become an urban farm site, but there may be more barriers to do so. For example, land owners may not be interested in selling their property or transforming the property into urban agricultural use. It may be difficult for an urban farm organization to raise enough money to purchase a site in private ownership. Many existing urban farms operate on public land that is leased for agriculture as a strategy to avoid high land purchase costs. Due to these various factors, this study makes the assumption that public land would be the easiest to develop into an urban farm with the lowest initial start-up costs.

It can be challenging to find land parcels large enough in size to support large-scale farming. A site of three acres is assumed to have the potential for high production. This is based on the precedent of other urban farm organizations in Portland discussed earlier in this chapter. This criterion of a parcel being at least three acres in size must be met for a site to be considered suitable. A site smaller in size would limit production capability.

Additional criteria are optional and add more suitability weight to the sites meeting the required criteria list above. The additional criteria are as follows:

- Class I or II soil
- Undeveloped land
- Good public transit connections (within ¼ miles of at least one bus line)

Class I or II agricultural soil will best support the highest vegetable production with fewer soil investments. However, this criterion does not have to be met for a site to be considered suitable. A site with poor soil, for example, may still produce good vegetable and fruit yields with investment in raised beds or importing good soil.

Several urban farm sites initially had poor soil, such as the Courthouse Garden and Grassroots Garden in Eugene, Oregon. The farm organizers either brought in good planting soil or built up the soil quality over the first few years of farming to support high vegetable production. Sites that already have good soil will have a lower initial start-up cost and lead time to high production of good quality produce. But sites with poor soil are not impossible to use for vegetable and fruit production.

Undeveloped land will have a lower cost associated with starting farming. There will be few costs for demolition or removing debris. Like soil quality, this criterion does not have to be met for a site to be considered suitable for farming.

Access to urban farms is the focus of this study, therefore suitable farming sites must have good transportation connections. As discussed earlier, under-served populations have lower car ownership rates which makes distance a barrier to accessing healthy food (Homeward Bound 12). A criterion for this analysis will be whether a suitable site is within a reasonable walking distance of a major public transit line. A reasonable walking distance of a transit line is assumed to be $\frac{1}{4}$ mile, which is a 5-10 minute walk. This criterion does not have to be met for a site to be considered suitable.

Analysis

Phase I: Neighborhoods In Need of Access

The first step of this analysis was to map the existing urban farms in the city of Portland and their service areas. The service areas are conjectured to be within one mile of the urban farm.

This produced the map shown in Figure 4.3. Areas in yellow are not currently covered by an existing urban farm. These areas in yellow are opportunity areas for a future urban farm to provide service to communities.

Food insecurity was mapped based on Portland Public School data of elementary students qualifying for the Free & Reduce Lunch Program. Areas within one half mile distance to the elementary schools were assigned a value range of 1-5 to reflect the percentage of students qualifying for this lunch assistance program. Schools with student populations of 0-49% were weighted with value of one, 50-69% a value of two, 70-79% a value of three, 80-89% a value of four and 90-100% a value of five. Figure 4.4 is a map of this criterion.

Low-income was the only criterion that was used to show an indication of food insecurity risk. The map of this indicator is seen in Figure 4.5.

Two criteria were used to determine community risk for poor nutrition, specifically childhood obesity: low-income households and ethnic minority households. Maps were generated to show where low income households and ethnic minority households are located in the city of Portland. The value ranges produced from these two maps were then combined into one map to show a range of community risk for poor nutrition.

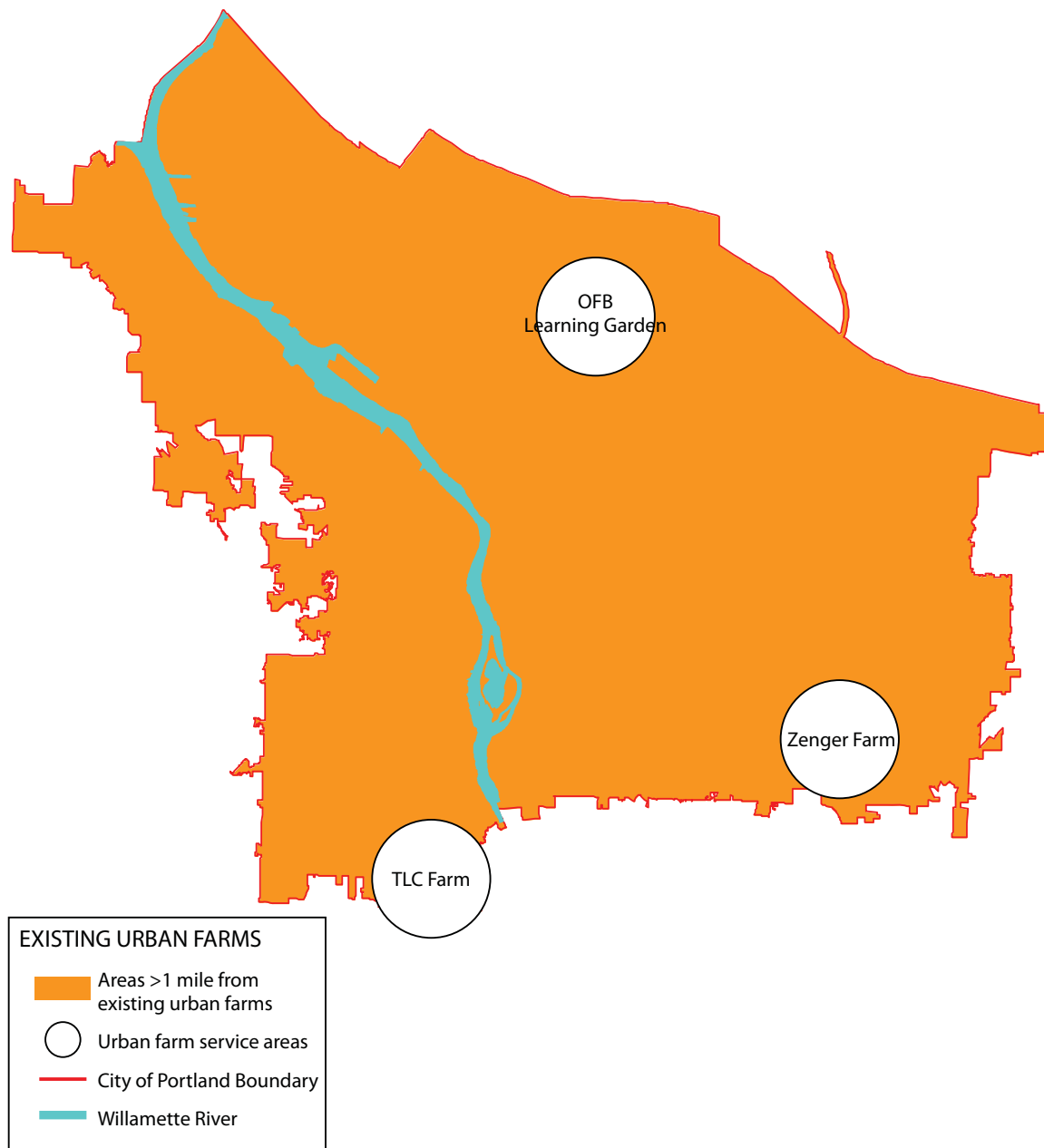


Figure 4.3: Areas in need of urban farm access in the city of Portland.

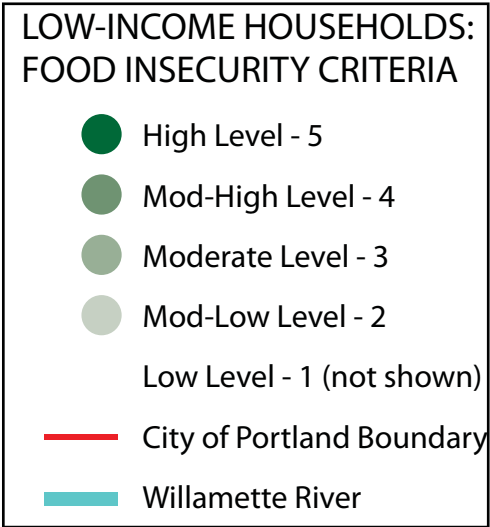
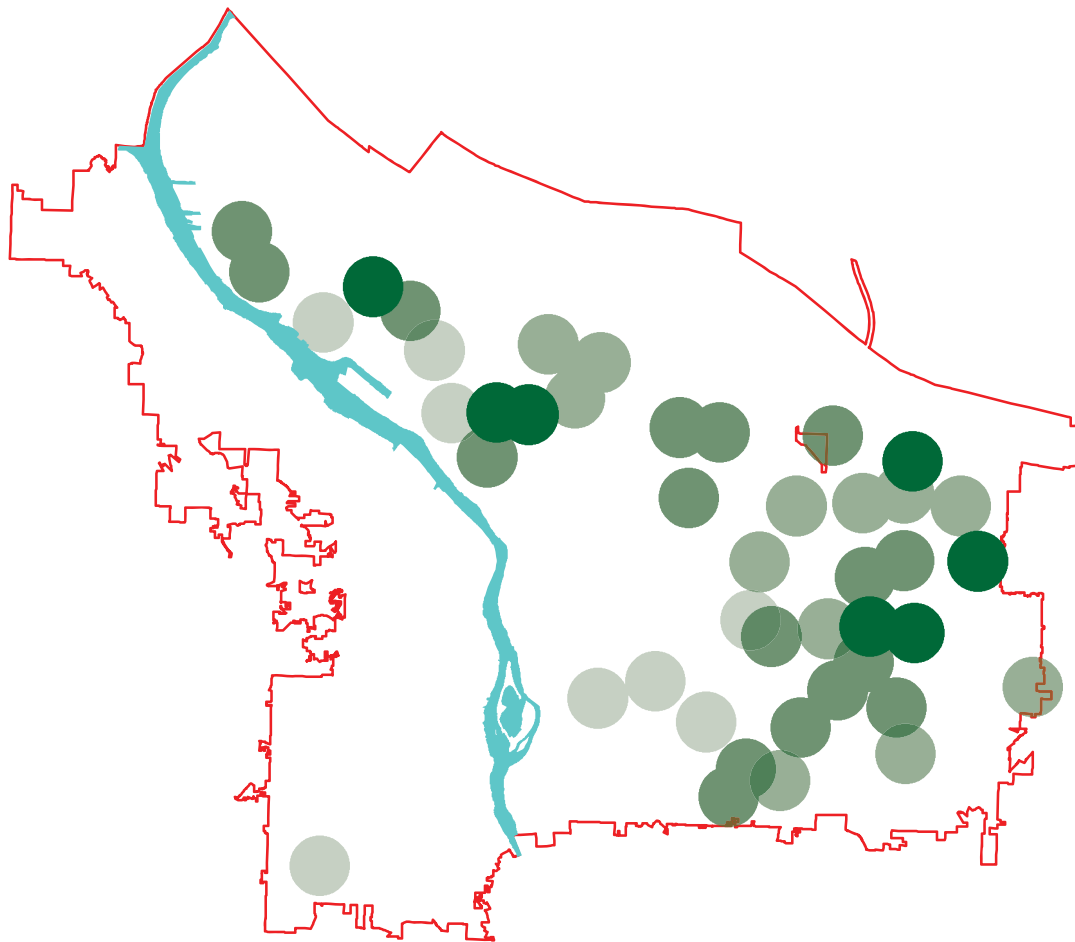


Figure 4.4: Low-income households based on elementary student populations qualifying for PPS Free & Reduced Lunch Program.

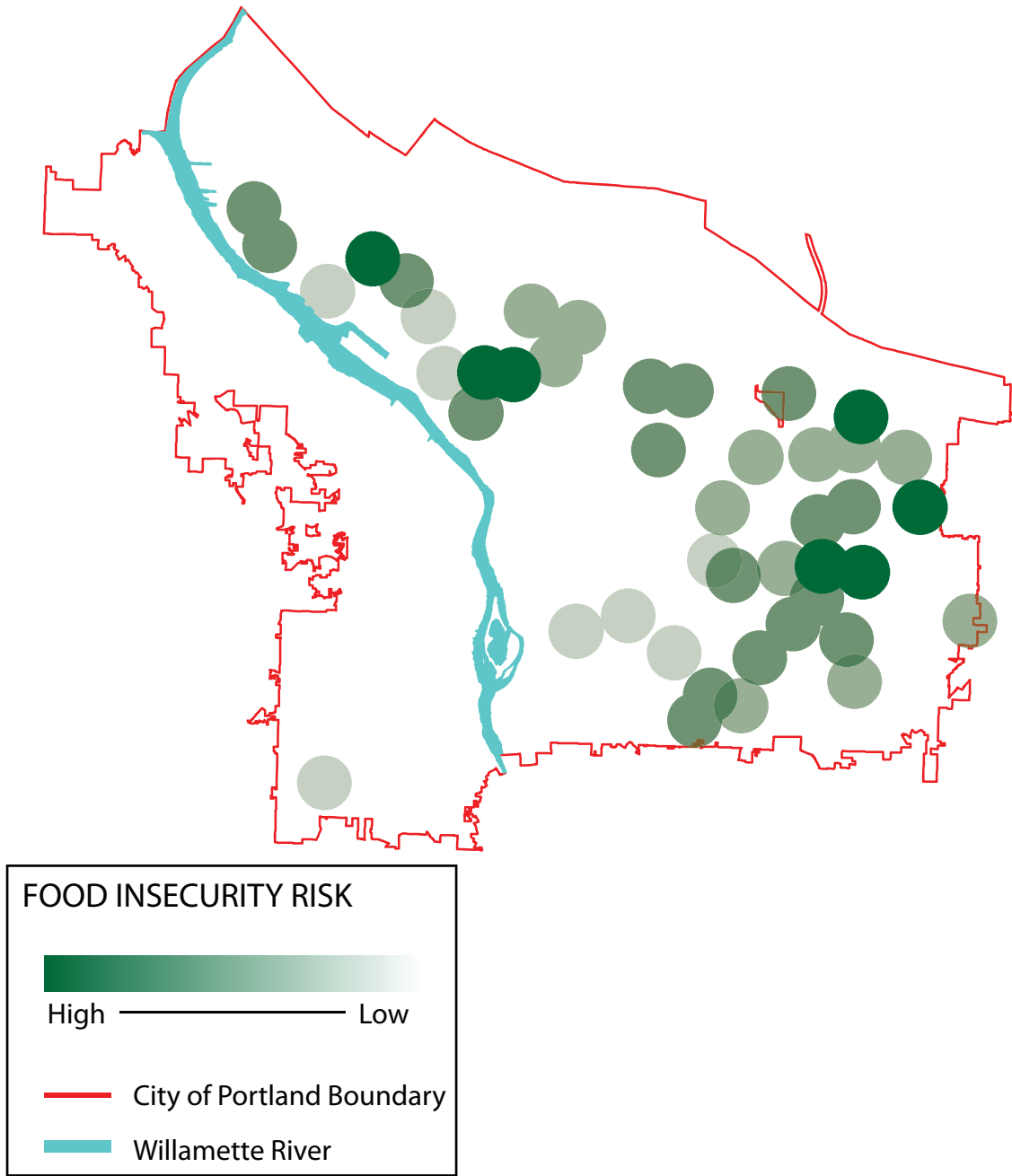


Figure 4.5: Map indicating community risk of food insecurity.

Low-income households were mapped using the Portland Public School data on elementary students qualifying for Free & Reduced Lunch Program. As done in the food insecurity risk mapping, areas within a half mile distance to the elementary school were assigned a value range of 1-5. Schools with student populations of 0-49% were weighted with value of one, 50-69% a value of two, 70-79% a value of three, 80-89% a value of four and 90-100% a value of five. That map can be seen in Figure 4.6.

Ethnic minority households were mapped using data from Portland Public Schools. This data lists the percentage of ethnic minority students by elementary school. Ethnic minorities are defined as any students who are non-white. Areas within a half mile distance to the elementary schools were assigned a value range based on the percentage of students who are ethnic minorities. Student populations of 0-49% were assigned a value of one, 50-69% a value of two, 70-79% a value of three, 80-89% a value of four, and 90-100% a value of five. This generated the map in Figure 4.7.

Poor nutrition was then mapped by creating a compilation of the two criteria: low-income households and ethnic minorities. The two criteria were given equal weighting. That compilation map is shown in Figure 4.8. Darker areas represent communities with a higher risk of poor nutrition.

Two criteria were used to determine the level of community cohesion in an area: crime rates and public park access. Maps were generated to show neighborhood crime rates and public park access. The value ranges produced from these two maps were then combined into one map to show a range of community cohesion levels.

Neighborhood crime rates were mapped using public data from the Portland Police Bureau. All crimes were counted evenly, so there was no differentiation between

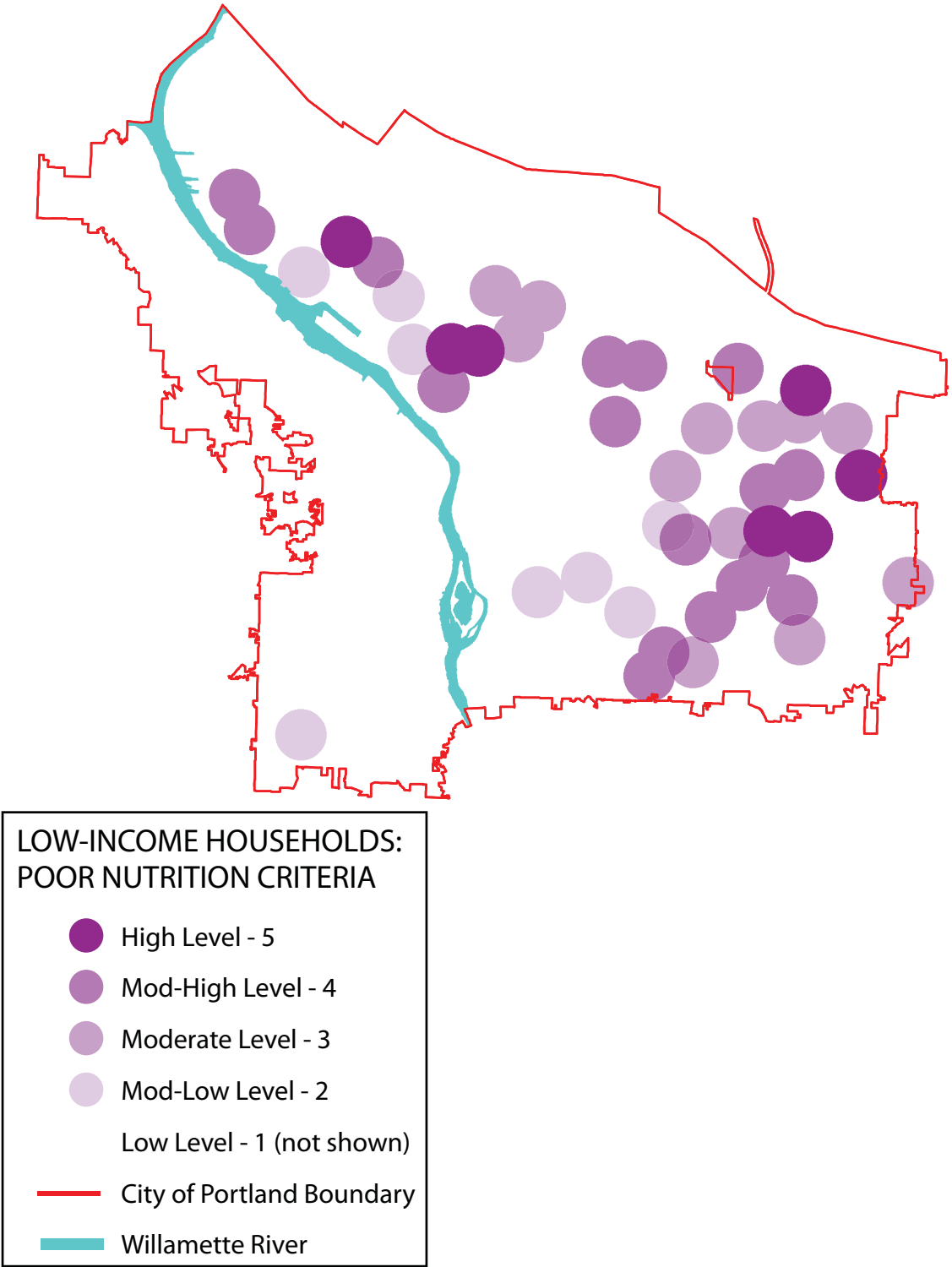


Figure 4.6: Low-income households based on elementary student populations qualifying for PPS Free & Reduced Lunch Program.

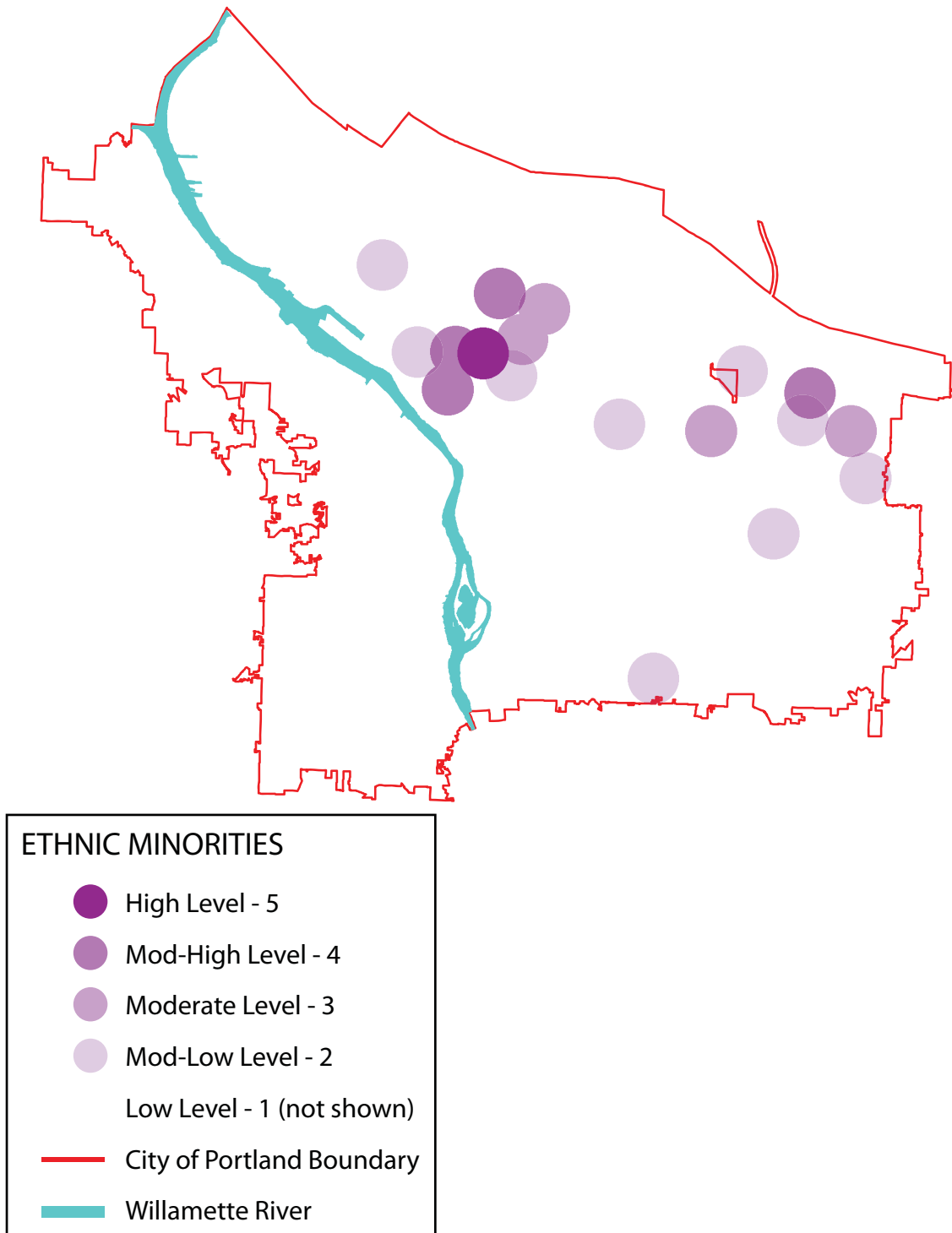


Figure 4.7: Ethnic minority households based on PPS elementary student population data.

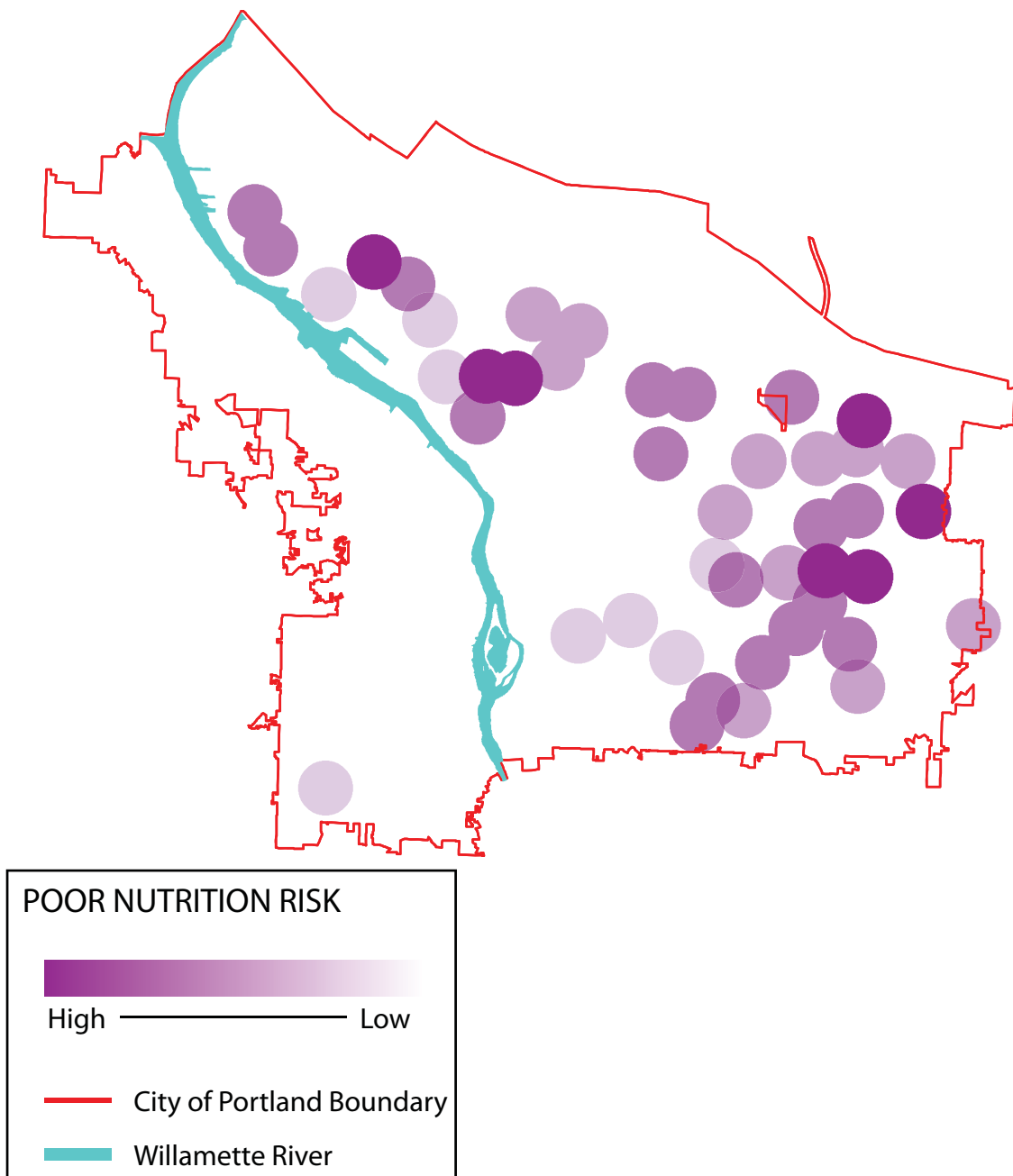


Figure 4.8: Map indicating community risk of poor nutrition.

violent crimes and petty theft, for example. Annual total crime rates by neighborhood from zero-549 were weighted with a value of one, 550-1,000 a value of two, 1,001-2,000 a value of three, 2,001-4,000 a value of four and anything above 4,001 a value of five. Figure 4.9 shows the map for crime rates.

Public park access was mapped based on Metro data of public park locations. As mentioned earlier, the quality of the parks was not a factor. Areas within a quarter mile distance to public parks are assumed to have good access. Areas more than a quarter mile from a public park are assumed to have poor access.

Visual analysis was used to estimate the percentage of a neighborhood that had good access to a public park. Neighborhoods were given a score based on how much of the neighborhood had good access to a public park. Areas with 100% access were given a score of one, 99-90% a two, 89-75% a three, 74-50% a four and less a 50% a score of five. The map of public park access is shown in Figure 4.10 with all areas lacking park access shown in blue.

The two criteria of crime rates and public park access were compiled to generate a map indicating levels of roughly estimated community cohesion. The compilation map of community cohesion is shown in Figure 4.11. Areas that appear darkest are considered at risk for poor community cohesion, while lighter areas may tend to have healthier community cohesion.

Criteria values of 1-5 scores were given equal weight among the criteria categories of food insecurity, community nutrition and community cohesion. The sum of these scores generated an overall neighborhood score, shown in Table 4.2. The score demon-

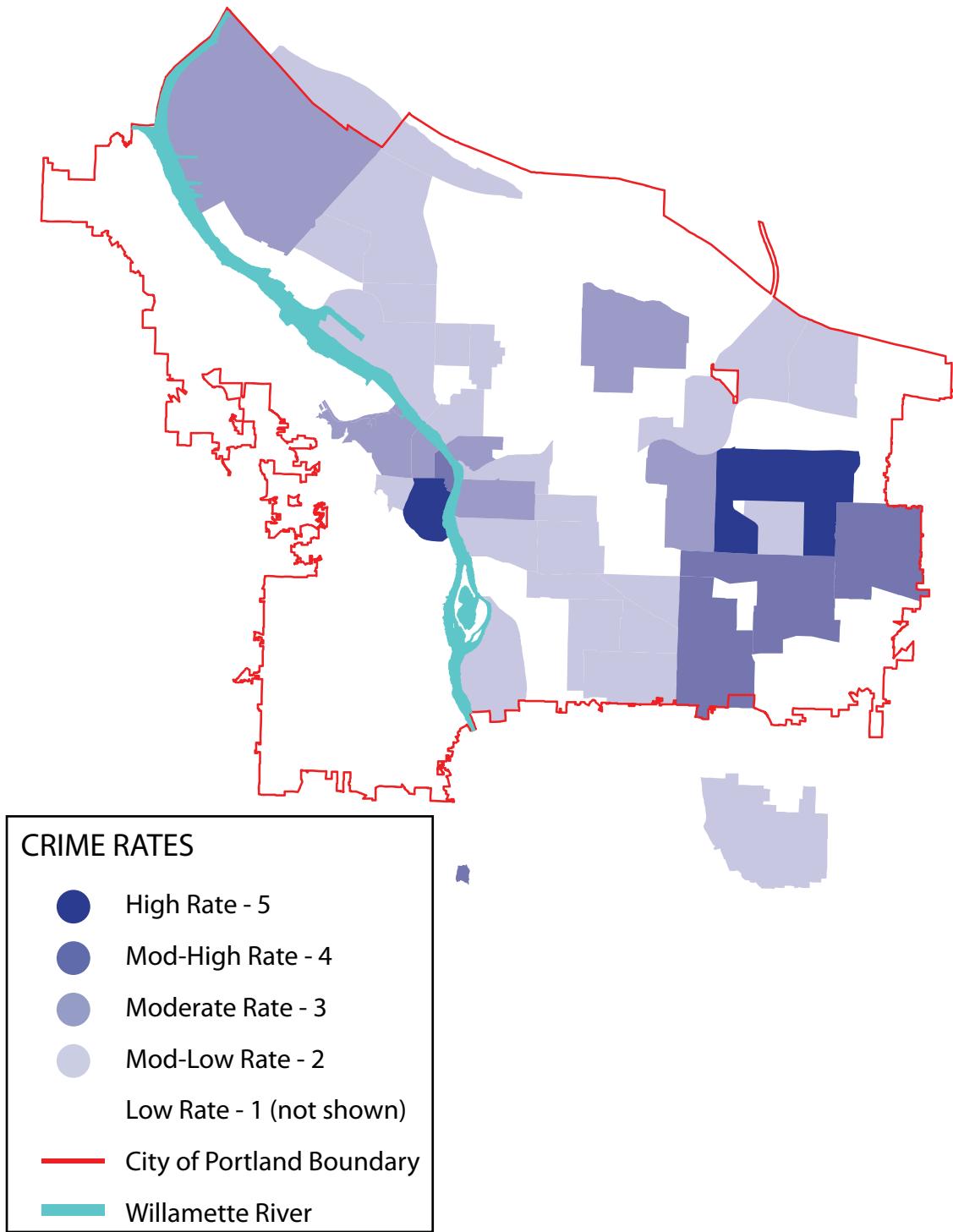


Figure 4.9: Map indicating crime rates.

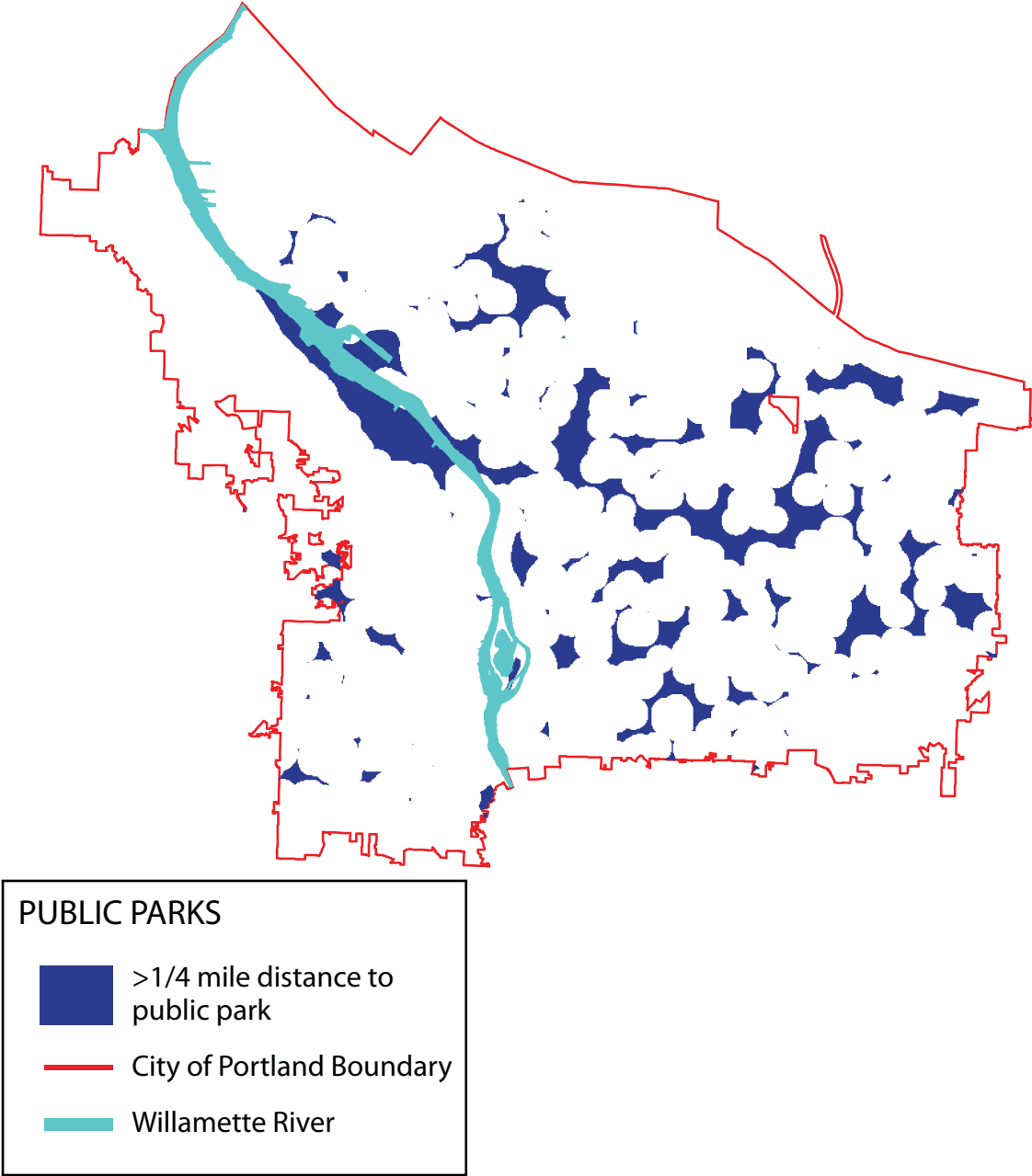


Figure 4.10: Map indicating public park access.

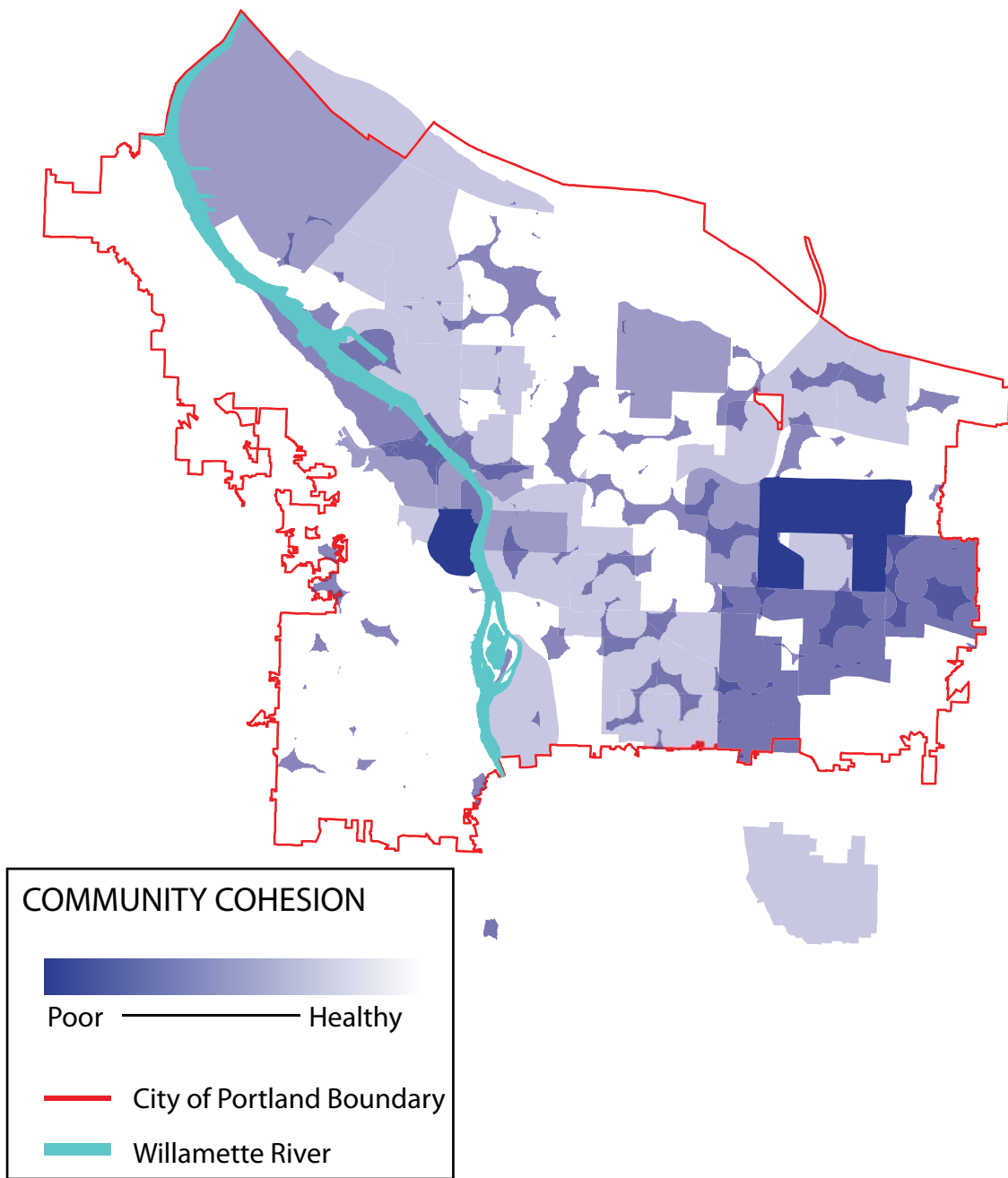


Figure 4.11: Map indicating risk of poor community cohesion.

Table 4.2: Neighborhood ranking of need for increased access to an urban farm.

Neighborhood	RISK LEVEL			
	Food Insecurity	Poor Nutrition	Lacking Community Cohesion	Overall Score
Humboldt	5.0	4.5	3.5	13.0
Argay	5.0	4.5	3.0	12.5
King	5.0	5.0	1.5	11.5
Cully Total	4.0	3.8	4.0	11.0
Hazelwood Total	4.0	3.0	4.0	11.0
Portsmouth Total	4.5	4.5	2.0	11.0
Eliot	4.0	4.0	2.5	10.5
Mill Park	5.0	3.5	2.0	10.5
St. Johns Total	4.0	3.3	3.0	10.3
Boise	4.0	4.0	2.0	10.0
Brentwood-Darlington	4.0	3.0	3.0	10.0
Glenfair	5.0	3.5	1.5	10.0
Parkrose	4.0	3.0	3.0	10.0
Montavilla Total	3.0	2.7	4.0	9.7
Powellhurst-Gilbert Total	3.7	2.5	3.5	9.7
Cathedral Park	4.0	3.0	2.5	9.5
Foster-Powell	4.0	3.0	2.5	9.5
Lents Total	3.7	2.8	3.0	9.5
Centennial	3.0	2.0	4.0	9.0
East Columbia	3.0	3.5	2.5	9.0
Kenton	4.0	3.0	2.0	9.0
Concordia	3.0	3.0	2.5	8.5
Rose City Park	4.0	3.0	1.5	8.5
Madison South	3.0	3.0	2.0	8.0
Sumner	4.0	3.0	1.0	8.0
Woodland Park	3.0	3.0	2.0	8.0
Woodlawn	3.0	3.5	1.5	8.0
Bridgeton	3.0	3.5	1.0	7.5
Parkrose Heights	3.0	2.0	2.5	7.5
Vernon	3.0	3.0	1.5	7.5
Wilkes	3.0	3.0	1.5	7.5
Sunderland Total	3.0	3.3	1.0	7.3
Mt. Scott-Arleta Total	3.0	2.3	2.5	7.0
Piedmont Total	2.5	2.5	2.0	7.0
Arbor Lodge Total	2.5	2.3	2.0	6.8
Creston-Kenilworth Total	2.0	2.0	2.5	6.5
Overlook	2.0	2.0	2.5	6.5
Russell	3.0	2.5	1.0	6.5
University Park	2.0	1.5	3.0	6.5
Pleasant Valley	3.0	2.0	1.0	6.0
Reed	2.0	2.0	1.5	5.5
Alameda	1.0	1.0	3.0	5.0
Crestwood	2.0	1.5	1.5	5.0
Far Southwest	2.0	2.0	1.0	5.0
Irvington	1.0	1.0	3.0	5.0

Table 4.2 (continued): Neighborhood ranking continued of need for increased access to an urban farm.

Lloyd District	1.0	1.0	3.0	5.0
North Tabor Total	1.0	1.0	3.0	5.0
Northwest District	1.0	1.0	3.0	5.0
Northwest Industrial	1.0	1.0	3.0	5.0
Portland Downtown	1.0	1.0	3.0	5.0
Buckman	1.0	1.0	2.5	4.5
Hosford-Abernethy	1.0	1.0	2.5	4.5
Old Town Chinatown	1.0	1.0	2.5	4.5
Pearl District	1.0	1.0	2.5	4.5
Richmond	1.0	1.0	2.5	4.5
Sullivan's Gulch	1.0	1.0	2.5	4.5
West Portland Park	2.0	1.5	1.0	4.5
Ashcreek Total	1.5	1.3	1.5	4.3
Ardenwald-Johnson Creek	1.0	1.0	2.0	4.0
Beaumont-Wilshire Total	1.0	1.0	2.0	4.0
Laurelhurst	1.0	1.0	2.0	4.0
Mt. Tabor Total	1.0	1.0	2.0	4.0
Roseway	1.0	1.0	2.0	4.0
Sabin	1.0	1.5	1.5	4.0
Sellwood-Moreland	1.0	1.0	2.0	4.0
South Tabor	1.0	1.0	2.0	4.0
Sunnyside	1.0	1.0	2.0	4.0
Woodstock Total	1.0	1.3	2.5	4.0
Bridlemile	1.0	1.0	1.5	3.5
Brooklyn	1.0	1.0	1.5	3.5
Collins View	1.0	1.0	1.5	3.5
Goose Hollow	1.0	1.0	1.5	3.5
Grant Park	1.0	1.0	1.5	3.5
Hillsdale	1.0	1.0	1.5	3.5
Kerns	1.0	1.0	1.5	3.5
Linnton	1.0	1.0	1.5	3.5
Maplewood	1.0	1.0	1.5	3.5
Arlington Heights	1.0	1.0	1.0	3.0
Arnold Creek	1.0	1.0	1.0	3.0
Eastmoreland	1.0	1.0	1.0	3.0
Forest Park	1.0	1.0	1.0	3.0
Hayhurst	1.0	1.0	1.0	3.0
Healy Heights	1.0	1.0	1.0	3.0
Hillside	1.0	1.0	1.0	3.0
Hollywood Total	1.0	1.0	1.0	3.0
Homestead Total	1.0	1.0	1.0	3.0
Markham	1.0	1.0	1.0	3.0
Marshall Park	1.0	1.0	1.0	3.0
Multnomah	1.0	1.0	1.0	3.0
Northwest Heights	1.0	1.0	1.0	3.0
South Burlingame	1.0	1.0	1.0	3.0
South Portland	1.0	1.0	1.0	3.0
Southwest Hills	1.0	1.0	1.0	3.0
Sylvan-Highlands	1.0	1.0	1.0	3.0

strates the community's need for increased access to an urban farm. A higher score in this ranking indicates a higher need for an urban farm.

The four maps from Phase I are combined to create a composite map of neighborhoods in need of access to an urban farm. This map is shown in Figure 4.12. Darker areas have a greater need for access to an urban farm than lighter areas.

The neighborhoods in highest need of increased urban farm access are Humboldt, Argay, King, Cully, Hazelwood, Portsmouth, Eliot, Mill Park, St John's, Boise, Brentwood-Darlington, Glenfair and Parkrose.

Phase II: Suitable Sites

The final stage of this research process applies the set of Phase II criteria to the areas in most need of increased access to an urban farm. As discussed earlier, land must be publicly owned and be at least three acres in size. Additional criteria will increase the likelihood that a site is good for large-scale urban farming: Class I or II agricultural soil, vacant land and land within $\frac{1}{4}$ mile of public transit.

Figure 4.13 is a map of the required criteria applied to the neighborhoods at most need of increased access to an urban farm. This map shows potentially suitable sites for the city of Portland. Figures 4.14, 4.15, 4.16, 4.17, 4.18 and 4.19 show these sites at a closer scale by neighborhood or cluster of neighborhoods.

Additional maps were generated to show areas that met both the required and optional criteria for site suitability. This includes the maps shown in Figures 4.20 and 4.21. These sites should be investigated first for further analysis to determine their potential for urban farming. If none of these final sites are considered adequate for development as an

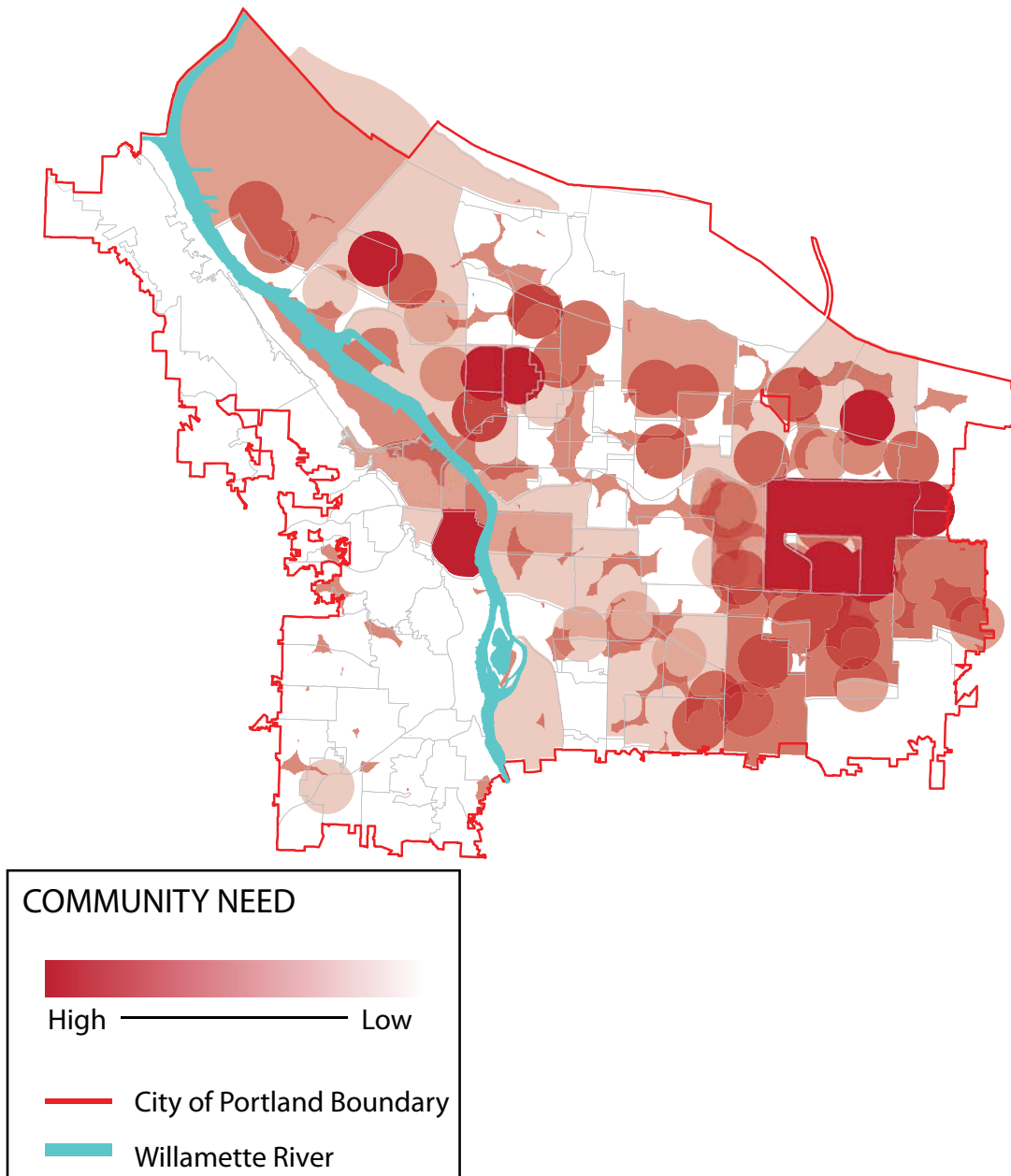


Figure 4.12: Map indicating community need for access to an urban farm.

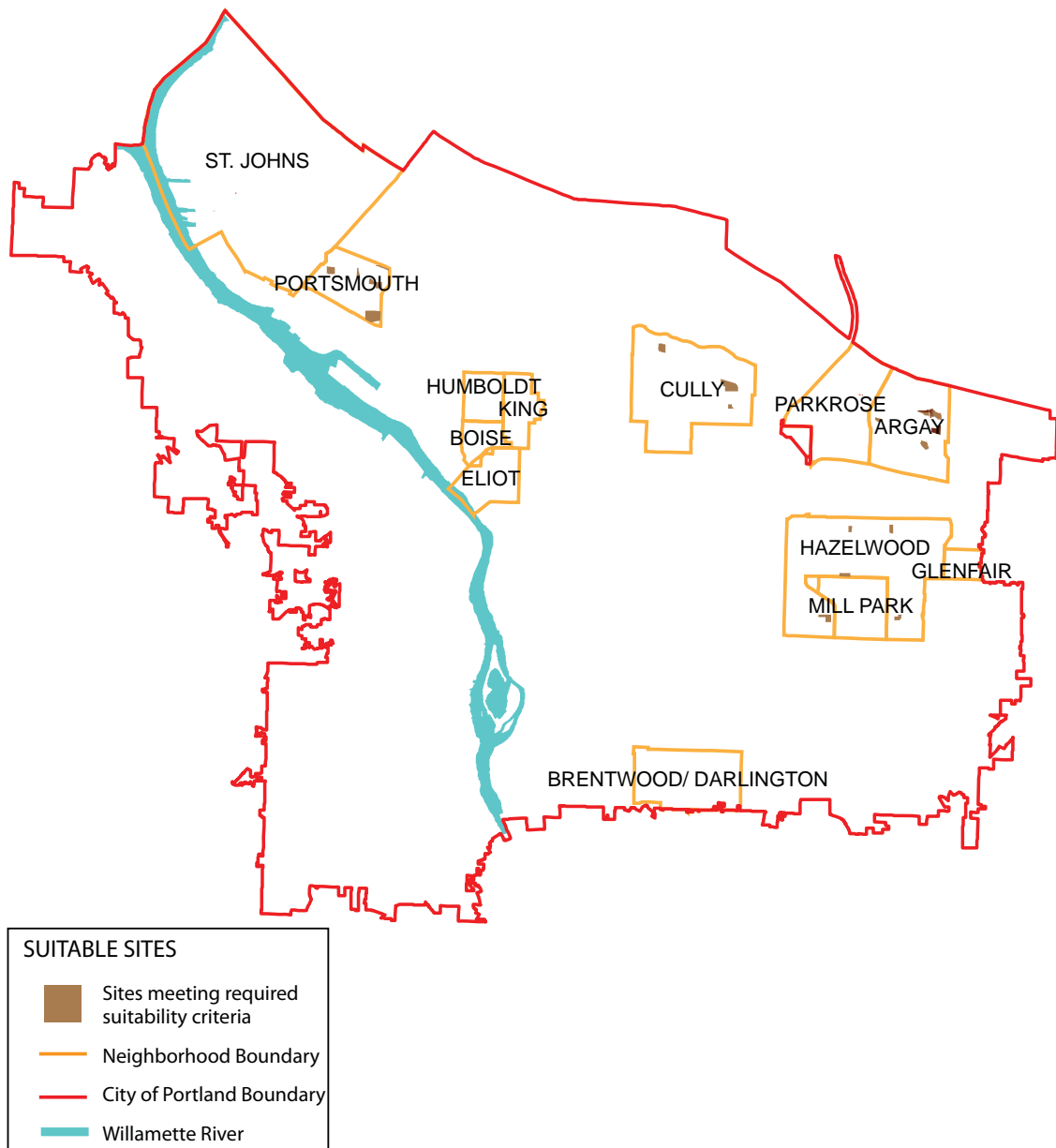
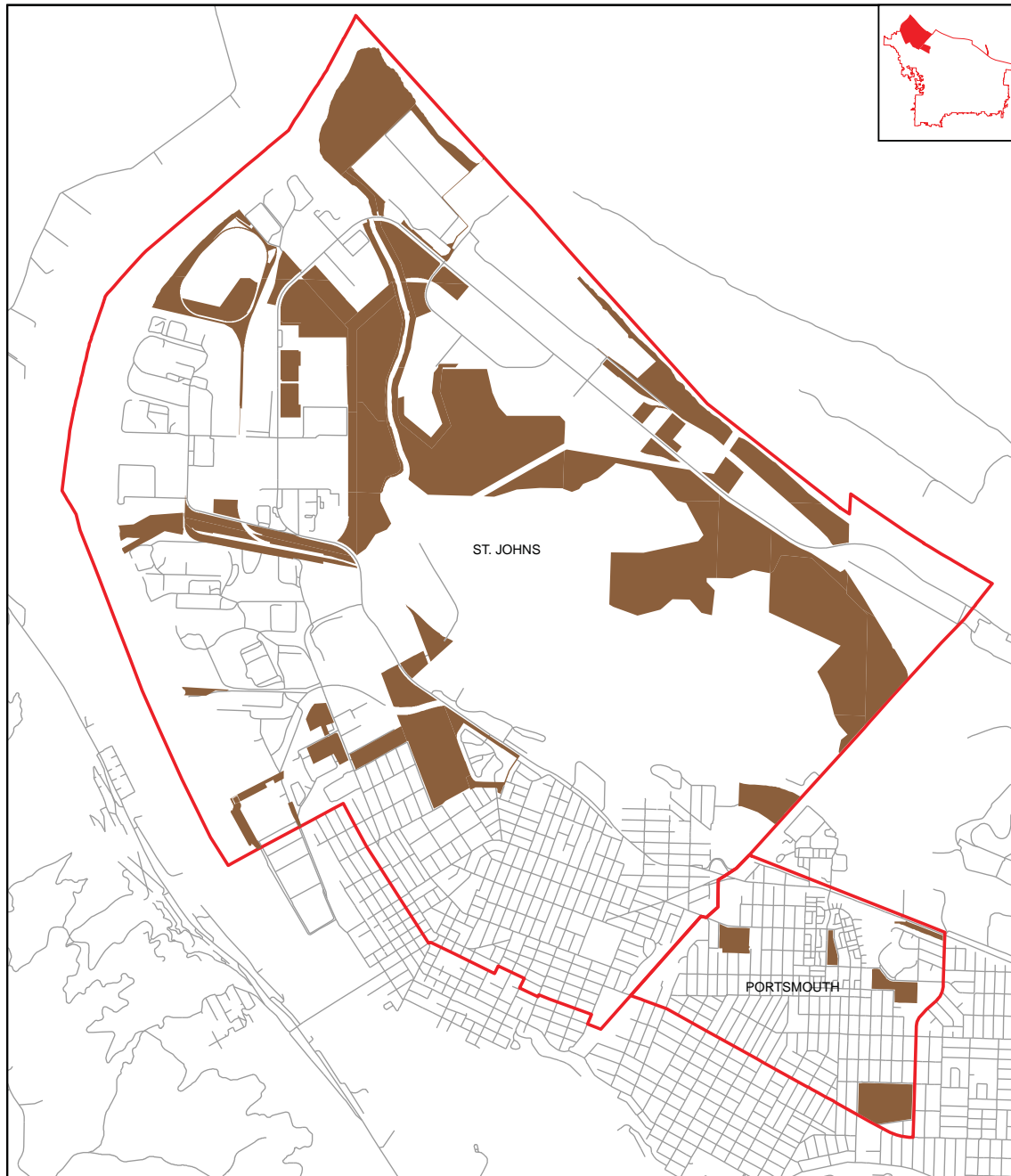


Figure 4.13: Potential urban farming sites in the city of Portland



SUITABLE SITES: ST JOHNS & PORTSMOUTH

- Sites meeting required suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

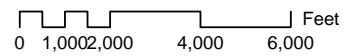
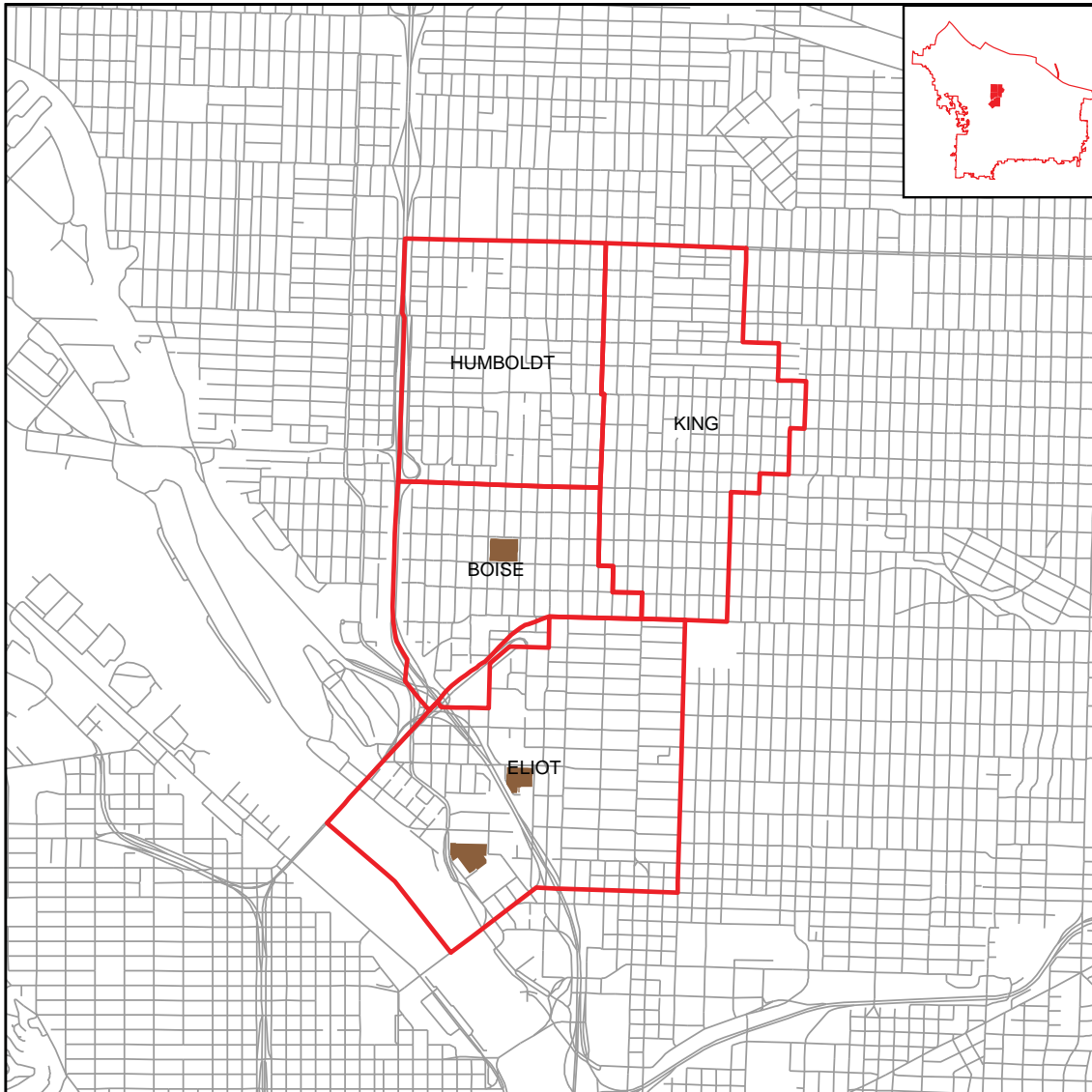


Figure 4.14: St Johns and Portsmouth neighborhood sites meeting required suitability criteria.



SUITABLE SITES: HUMBOLDT, KING, BOISE, & ELIOT

- Sites meeting required suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

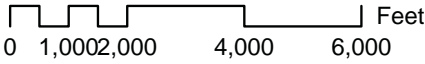
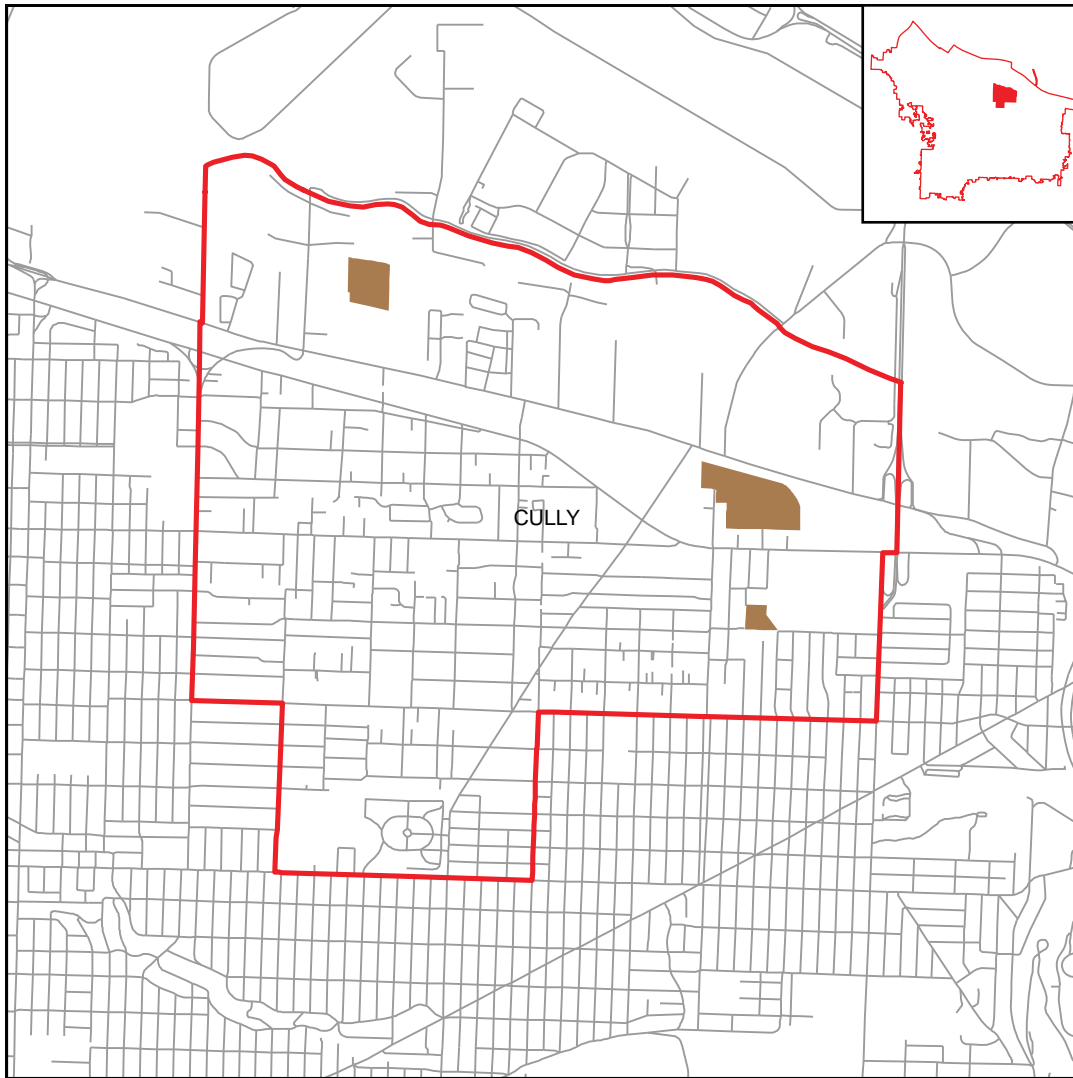
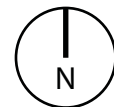


Figure 4.15: Humboldt, King, Boise and Eliot neighborhood sites meeting required suitability criteria.



SUITABLE SITES: CULLY

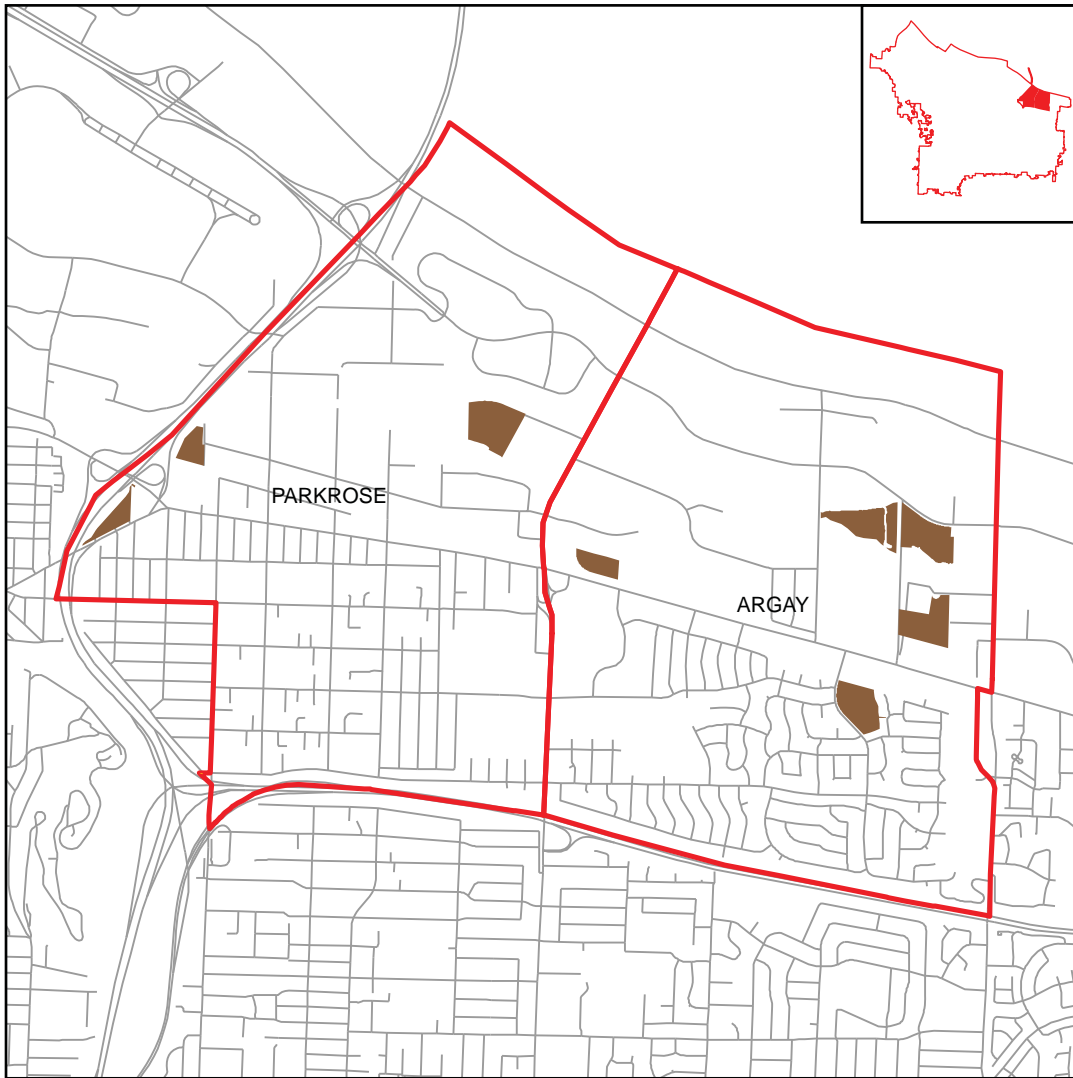
- Sites meeting required suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

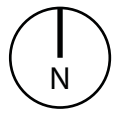


Figure 4.16: Cully neighborhood sites meeting required suitability criteria.



SUITABLE SITES: PARKROSE-ARGAY

- Sites meeting required suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

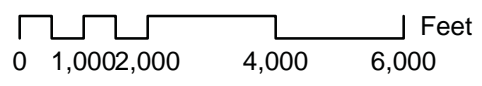
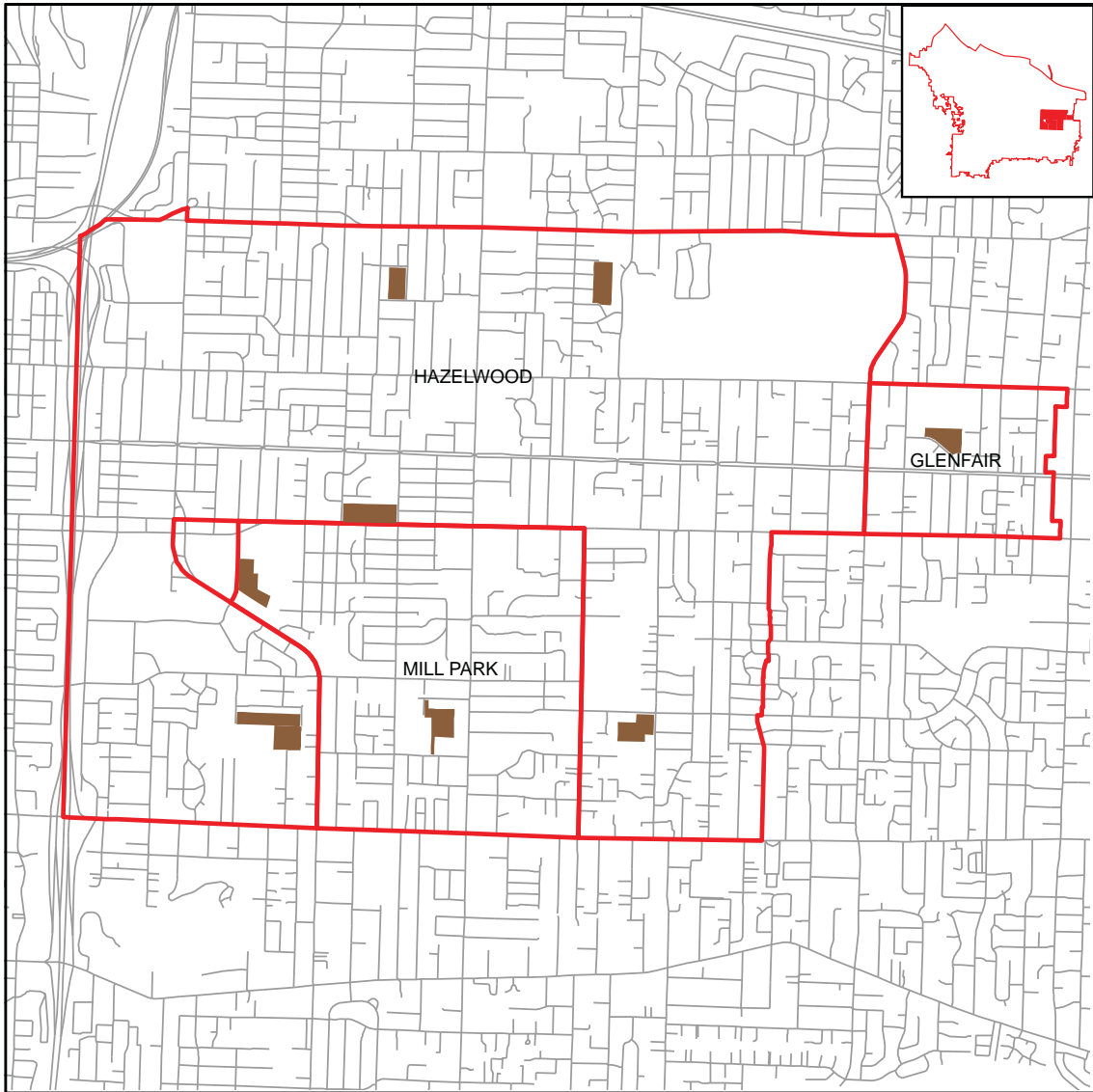
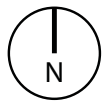


Figure 4.17: Parkrose and Argay neighborhood sites meeting required suitability criteria.



SUITABLE SITES: HAZELWOOD, MILL PARK & GLENFAIR

- Sites meeting required suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

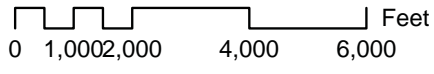
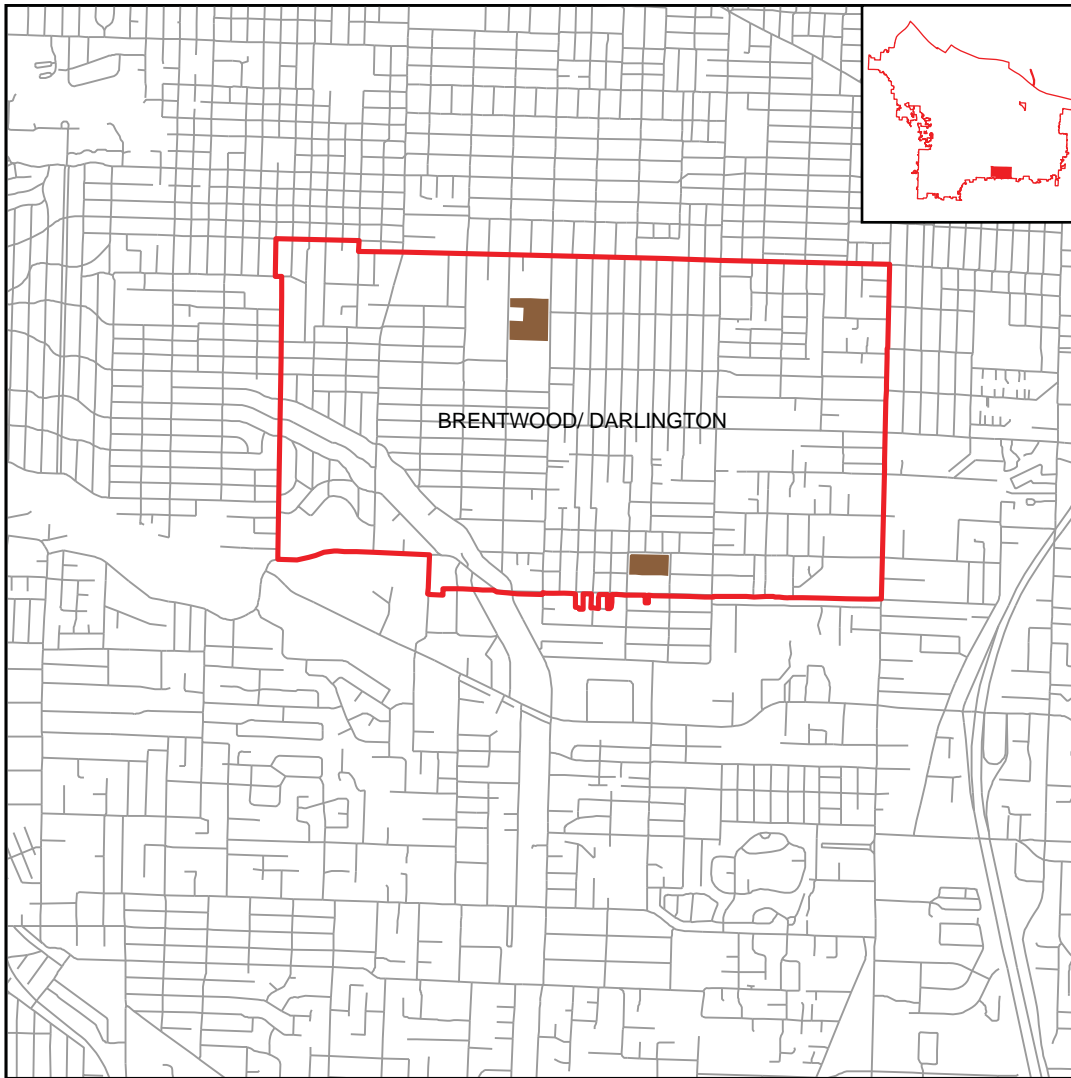
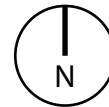


Figure 4.18: Hazelwood, Mill Park and Glenfair neighborhood sites meeting required suitability criteria.



SUITABLE SITES: BRENTWOOD-DARLINGTON

- Sites meeting required suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

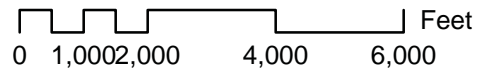
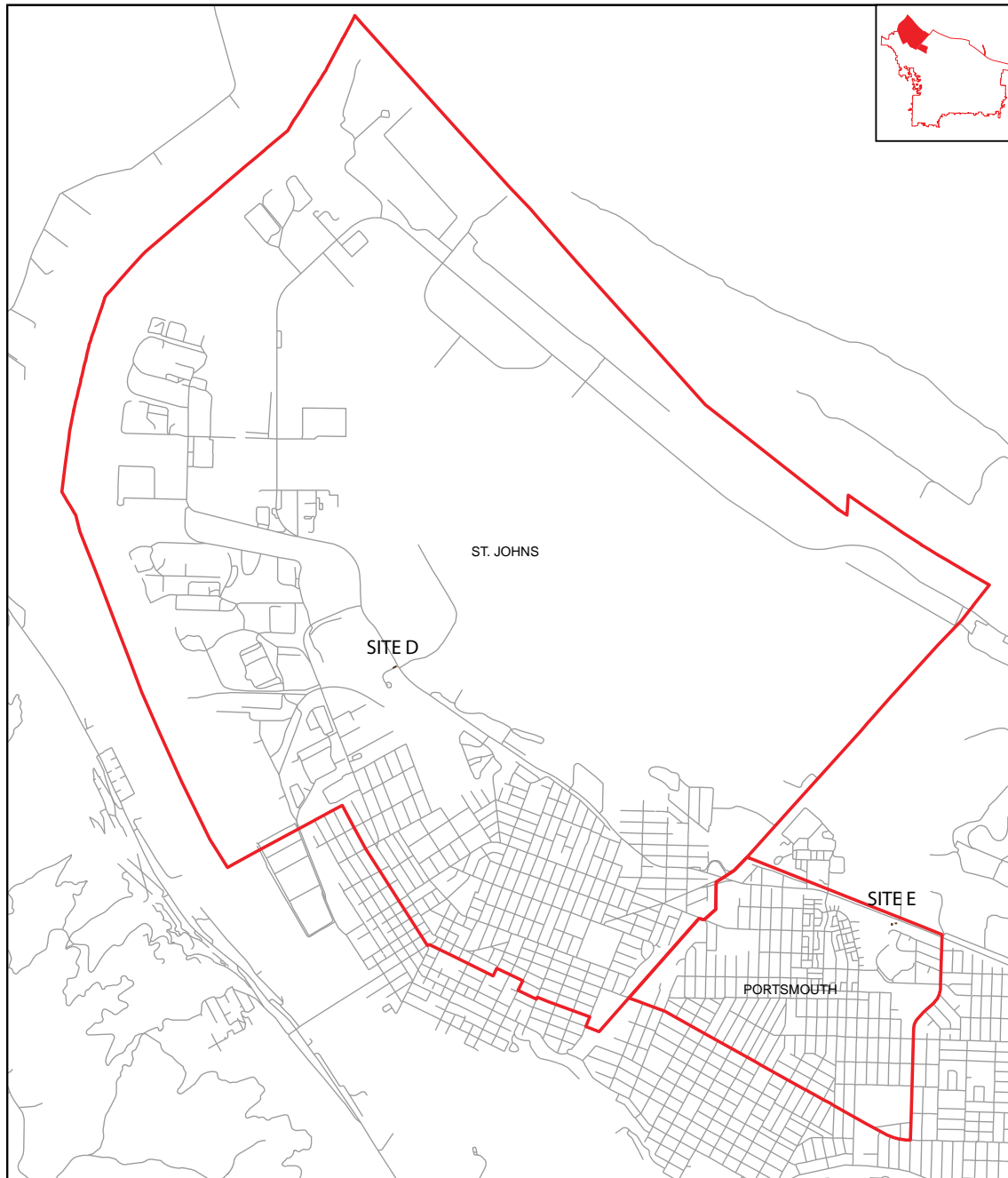


Figure 4.19: Brentwood-Darlington neighborhood sites meeting required suitability criteria.



BEST SUITABLE SITES: WEST

- Sites meeting required and optional suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

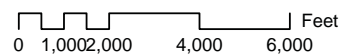
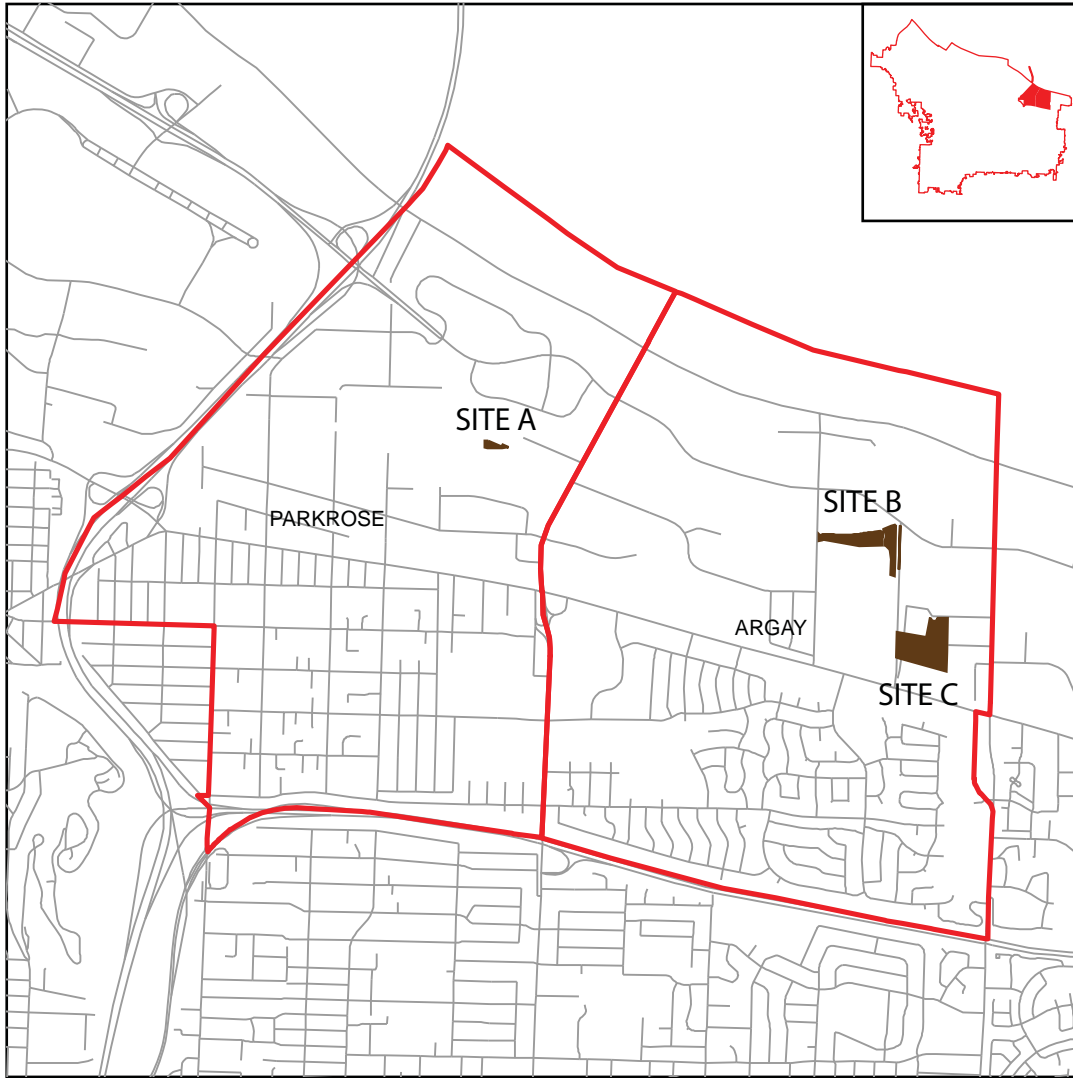
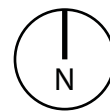


Figure 4.20: Western neighborhood sites meeting required and optional suitability criteria.



BEST SUITABLE SITES: EAST

- Sites meeting required and optional suitability criteria
- Neighborhood Boundary
- Streets



1 inch = 3,000 feet

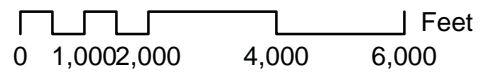


Figure 4.21: Eastern neighborhood sites meeting required and optional suitability criteria.

urban farm, the sites meeting just the required criteria should be investigated for potential suitability.

Report

The potentially suitable sites meeting all required and optional criteria resulted in five land parcels. A summary of their characteristics is outlined in Table 4.3. These five sites were publicly owned and at least three acres in size. In addition, the final sites were vacant, had Class I or II agricultural soil and were within a quarter mile of public transportation. However, several other aspects of these sites must be considered.

Table 4.3: Suitable sites summary.

	Neighborhood	Acrage	Ownership	Address	Details
Site A	Parkrose	12.13	City of Portland BES	12002 NE Invesness Dr	Industrial area, difficult to access, near Multnomah County Jail
Site B	Argay	9.81	City of Portland BES	4998 NE 138th Ave	Adjacent to Columbia River slough, Industrial area
Site C	Argay	10	City of Portland BES	NE Whhitaker Way	Industrial area, but close proximity to large housing development
Site D	St Johns	16.75	City of Portland Parks & Rec	9360 N Columbia Blvd	Used as a park. Ammenities include off-leash dog area and picnic tables
Site E	Portsmouth	3.7	City of Portland Parks & Rec	SW corner of Columbia Blvd & N Chautauqua Blvd	Appears to be right-of-way between road/railroad and housing development

Sites A and B are surrounded by predominantly industrial use, which could limit access to a potential urban farm in these areas. An ariel photo of these sites are shown in Figures 4.22 and 4.23. Visitors could access an urban farm on either of these sites through the use of public transit or by driving. However, the sites may be located too far from residential areas to be accessible by walking.

Figure 4.22: Site A (Google Earth)



Figure 4.23: Site B (Google Earth)



Site A is in very close proximity to the Multnomah County Jail. This could be a deterrent for potential visitors, including school groups, to visit and actively participate with an urban farm at this location. However, an urban farm at this location could incorporate the nearby jail into its programming. Perhaps inmates could maintain a portion of the urban farm or spend community service hours working at the farm.

Site B is located along the Columbia River Slough, a potentially sensitive wildlife and wetland area. Active farming here may disrupt wildlife and seasonal flooding may damage infrastructure to an urban farm here. Alternatively, seasonal flooding may also help keep soil fertility high. Farming may be possible at this location if a portion of the site acts as a buffer between the urban farm and wetland areas.

Site C, shown in Figure 4.24, is immediately surrounded by industrial zoning. However, unlike Sites A and B, this site is very close to a residential subdivision. Residents may be able to walk to an urban farm at this location provided there are adequate sidewalks to connect to the farm. Due to these considerations, Site C appears to be the best location for urban farming among these final five sites.

Site D, shown in Figure 4.25, is currently used as an off-leash dog park with additional passive recreation options within the park. Ideally, an urban farm should be in addition to any community gathering opportunities already in place. However, this park is nearly seventeen acres in size. An under used portion of the site could be converted into an urban farm.

Site E, shown in Figure 4.26, appears to be located on a edge of a residential neighborhood between busy Columbia Boulevard and railroad tracks. This could be a very visible and under-used area that could be a good urban farm site. Site visits can confirm

Figure 4.24: Site C (Google Earth)



Figure 4.25: Site D (Google Earth)



Figure 4.26: Site E (Google Earth)



additional details about the suitability of this parcel for urban farming. For example, if high-voltage power lines are present this may not be an ideal site for active farm use and school groups. There appears to be a community garden to the south of this site. Further investigation is needed to determine the ownership and use of that garden.

This methodology positions the market researcher in a starting place for further planning analysis. This preliminary investigation determined that Sites C and E are the two most suitable sites for urban farming based on this set of criteria. However, site visits and additional research should ultimately identify the potential for each site to be converted to farming.

Neighborhoods may have their own grassroot efforts underway to establish an urban farm. Those neighborhoods should be prioritized for future urban farm locations

as they demonstrate the community's desire for an urban farming resource. Where efforts are not currently underway, community surveys may further demonstrate neighborhood desire for an urban farm.

Other considerations, like the city's desire to lease the land, may present new challenges and opportunities. Private land-owners may emerge with an interest in conserving their properties through urban agricultural easements or donations. Multiple sites that are smaller in size may still provide opportunities for large-scale agriculture if intensively or jointly farmed.

In closing, the final five sites may not be the only options for urban farming in the neighborhoods in need of increased access to healthy foods. This study represents one method for conducting market research to determine how to increase access of healthy foods to under-served communities.

CHAPTER V

CONCLUSION

Applying a market research based approach to determining urban farm locations could improve access of healthy foods to under-served communities. Using this proactive approach can increase access to healthy foods as a successful strategy to raising food security, nutrition and community cohesion. This is particularly the case for under-served communities that need additional support in order to obtain these benefits.

As the urban farming movement continues to grow, it will become increasingly important for future urban farms to minimize duplication of their service areas with existing urban farms. Targeting under-served communities presents an opportunity to reach a new consumer base while addressing the inequities of access to healthy foods.

This methodology could be applied in different urban areas to determine urban farm locations in close proximity to under-served communities. However, there are limitations to this methodology that could present challenges, as follows.

Other urban areas may not have GIS data that is free and as readily available as the city of Portland. This may increase the cost and time of conducting market research. The GIS data that is available may be at a broader scale than the neighborhood level. This could generate data that is too general to identify specific urban farming sites.

Zoning codes vary from one city to another. There may be certain restrictions in other urban areas on the type and scale of agriculture that can occur within city limits. For example, livestock may be prohibited or farming activities may only be legal at a smaller scale. Urban farming advocates will typically be successful in obtaining variances and zoning code changes to enable urban farming.

Portland, Oregon, is a city that already embraces urban agriculture. There could be a saturation limit on the number of farms one city can support, particularly in cities with an already strong network of urban farms.

Urban areas with less awareness of urban agriculture may be slower to adopt the services of an urban farm. Urban farms in those emerging markets may need more marketing support and community education to be successful. Some communities may never use an urban farm, regardless of how easy it is to access the farm.

The market analysis from this study could be further improved with additional data collection components. A public survey may inform the market research even further. Focus groups may provide more information about the distances under-served communities are willing to travel to access urban farms.

The application of this methodology to Portland had certain limitations. Data from the public elementary schools were used to represent neighborhood characteristics. However, school district boundaries do not match neighborhood boundaries. Therefore, the elementary school data provided a broad indication of neighborhood risk factors. Census data may have provided more specific results, but may have been more cumbersome and time consuming to analyze.

In conclusion, this methodology represents one strategy for addressing the issue of inequitable access to healthy foods. It demonstrates the contribution that market research can make to planning urban farm locations.

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