

Residents' Drivers and Barriers to Participation
in the Backyard Habitat Certification Program:
Study of socio-ecological factors in Madison South neighborhood
in NE Portland

by

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Abstract:

As urban development fractures and reduces available habitat for birds and other wildlife, conservationists are increasingly pursuing strategies to improve the habitat value of privately owned yards in and around cities. The Backyard Habitat Certification Program is a collaborative effort between the Portland Audubon Society and the Columbia Land Trust that has a two pronged mission: to increase the amount of available habitat for wildlife in the Portland Metro region by encouraging homeowners of lots one acre or less to naturescape their yards; and to increase stewardship and conservation awareness by broadening their participant base. Backyard Habitat's agency in achieving both goals is linked to 1) their effectiveness at engaging and enrolling residents, 2) residents' access to greenspace, and 3) their interest and agency in naturescaping their yards. Based on circumstantial evidence, Backyard Habitat is concerned they are not capturing the racial and ethnic diversity of the communities that they serve. This suggests that cultural and/or structural factors are limiting their access to private yards and scope in providing conservation education. This study begins to explore the drivers and barriers to participation in the Northeast Portland neighborhood of Madison South with the objective of providing community specific and generalizable recommendations on how Backyard Habitat could broaden and deepen participation.

Madison South was chosen as the study site because Backyard Habitat would like to increase participation there in order to enhance the impact of a large-scale habitat restoration project: the Dharma Rain Zen Center's development at Siskiyou Square. The study used a social-ecological framework to explore both ecological and sociological factors that could serve as drivers or barriers to residents in choosing 1) to naturescape and 2) to participate in the Backyard Habitat Certification Program. The study consisted of three phases and looked at two scales of analysis: structural and cultural factors at the societal level and at the individual scale. Phase 1 assessed societal structural and cultural factors within the neighborhood (n= 5,314) including racial and ethnic diversity, language fluency, tenure status, and the value and distribution of greenspace using a combination of US Census data and publicly available on-line mapping tools (Metro Maps, Portland Maps, and Intertwine Alliance's Regional Conservation Strategy overlays, Google Maps). Phase 2 and 3 consisted of smaller group of participants (n=28) that lived within 200m Siskiyou Square, and used mixed methods door-to-door surveys and guided interviews to explore individual interests, beliefs, and constraints shaping both desired and actual yard use. Phase 2 included the use of a yard-type instrument that allowed participants to indicate their interest in naturescaped, highly manicured, and predominantly permaculture yards by selecting among photographs.

The study found that Madison South would be a good neighborhood for Backyard Habitat to engage with the purpose of diversifying their base since it was a relatively diverse racial and ethnic neighborhood within the Portland Metro region. However, since homeownership was disproportionately limited to White and Asian residents, the author recommends that Backyard Habitat should consider strategies for including renters in order to engage a representative demographic. Considering the percentage of rented, single-family homes with yards around the Siskiyou Square neighborhood, such strategies could serve Backyard Habitat's ecological goals. The study identified limited English as a likely barrier for engaging some homeowners, particularly elderly Vietnamese.

However the participant pool was too small to identify preferences, such as desired yard-type, along racial or ethnic lines. With 19% of homes owned by racial and ethnic minorities, Backyard Habitat should consider strategies for further identifying, and overcoming cultural barriers. The survey, interview questionnaire and yard-type instrument appeared useful at identifying receptivity to naturescaping and strategies for broadening participation. Based on the study's findings and input from participants, the study makes recommendations for how Backyard Habitat can increase participation by being better known, being appealing, and being feasible to a variety of residents.

CHAPTER 1: Introduction

Research Problem

The Backyard Habitat Certification Program is a collaborative effort between the Portland Audubon Society and the Columbia Land Trust to enhance the ecological health of the Portland urban area by encouraging homeowners to landscape their yards using practices beneficial to birds and other wildlife (Columbia Land Trust, 2013; Audubon Society of Portland, 2013). Wildlife-friendly gardening or, naturescaping, includes removing invasive plants, gardening with natives, maintaining tiered tree and shrub-canopies, minimizing pesticide and herbicide use, and reducing run-off with rain-gardens. These practices not only provide habitat for wildlife, they can benefit yard-owners and the community at large. Societal benefits include increased access to wildlife, greater ecological resiliency due to species diversity, enhanced water-filtration and temperature regulation, and improved river-water quality that are tied to human well-being (Louv, 2006; Miller, 2005) and reduced societal costs (Goddard, Dougill, & Benton, 2009; Houck & Sallinger, 2013). So, while Backyard Habitat focuses on “gardening for wildlife” (Audubon Society of Portland, 2013), the activity it promotes benefit the entire social-ecological urban community. Sounds great! So why doesn’t everyone do it?

Backyard Habitat’s mission of expanding the amount of wildlife friendly habitat in developed areas relies on having access (Ribot & Peluso, 2003) to private yards. In order to have access Backyard Habitat needs homeowners to willingly participate. Through the certification and renewal process (Audubon Society of Portland, 2013), Backyard Habitat partners with participants in co-managing the yards. Backyard Habitat provides advice and ensures that the yards continue to meet habitat and stewardship standards. Through plant-sales, coupons, newsletters and yard tours they facilitate participants’ access to cultural capital (Flora, Flora, & Fey, 2004) in the form of materials and knowledge. Participants create the design, resource materials, and do the labor. However, in order for homeowners to participate they need to know about the program, find the concept inspiring, and be willing and capable of doing the work. In this way Backyard Habitat’s and its participants’ agency are interconnected.

There is a second social reality that Backyard Habitat wishes to address that might be limiting their mission-effectiveness and ability to remain relevant as a conservation education program in the long-term (Jolly, 2009; Bonta & Jordan, 2005). Based on anecdotal evidence, they believe their participants are not representative of the ethnic diversity of the neighborhoods that they serve. This suggests that there are yards that they don’t have access to due to cultural barriers. Moreover, as Portland becomes increasingly multicultural, Backyard Habitat will become less relevant if they can’t figure out how to reach a broader demographic than whites (Bonta & Jordan, 2005). Thus bridging to ethnic communities currently under-represented could keep Backyard Habitat a vital player in how communities learn to be good stewards in our urban settings.

Backyard Habitat is interested in engaging the residents in the North Portland neighborhood of Madison South where they currently have a low number of participating yards. They have been working with Dharma Rain Zen Center to help restore a portion of Dharma Rain's recently purchased "Siskiyou Square" property. Siskiyou Square is a former abandoned land-fill in the heart of the Madison South Neighborhood. As a grassy field with a wooded gully, it provides significant habitat for local wildlife. Dharma Rain plans to reserve 1/3 of their parcel as wildlife habitat, cultivate 1/3 with permaculture vegetable gardens and orchards, and develop 1/3 as residents and a teaching and worship center (Gyokuko, 2014). Backyard Habitat sees potentially significant ecological benefits in Dharma Rain's plans for conservation and would like to compound the benefits to wildlife by increasing the habitat's "patch size" by engaging nearby properties in naturescaping their yards.

Research Purpose

To aid the Columbia Land Trust and Audubon Society of Portland in identifying strategies for engaging under-represented demographics in the Backyard Habitat Certification Program (BHCP) in order to increase the diversity of their base and build capacity with the Dharma Zen restoration project.

Key Terms

Naturescaping: is a form of landscaping using simple techniques that mimic nature so that one's garden will thrive without using synthetic chemicals, making it a safe and healthy place for children, pets, and wildlife. It includes using a percentage of locally native plants. (EMSWCD, <http://emswcd.org/in-your-yard/naturescaping/>)

Backyard: I use this term broadly to include any portion of the householder's property that is not built.

CHAPTER 2: Literature Review

Background Context

Increasingly social scientists and ecologists are referring to the modern era as the Anthropocene (Glaser, 2012). In considering issues such as climate change, population growth, and increasing urbanization there is growing awareness that our environment is changing fast and that human-activity is driving much of the change (Glaser, 2012; Davidson, 2010; Walker, Holling, Carpenter, & Kinzing, 2004; Goddard, Dougill, & Benton, 2013). This change is not only affecting the quality and distribution of natural resources that influence wildlife abundance and diversity (Goddard, Dougill, & Benton, 2009), but, in doing so, human health (Clayton, 2007; Louv, 2006), well-being (Miller, 2005), and agency (Ribot & Peluso, 2003; Glaser, 2012; Folke, et al., 2002). Because human and ecological vitality are intertwined, many of these thinkers argue that if we want to understand the relationship between biodiversity and human activity in order to affect change, we need to address social and ecological systems as a single entity (Glaser, 2012; Folke, et al., 2002).

Researchers interested in understanding and influencing the human-nature dynamic are increasingly turning their attention to urban areas (Grimm, Grove, Pickett, & Redman, 2000; Goddard, Dougill, & Benton, 2009; Clayton, 2007; Nassauer, Wang, & Dayrell, 2009). When we thinking in terms of 'Social-Ecological-Systems' (SES), we ask questions such as "Can we build healthier cities that can sustain biodiversity while accommodating growth?" "Can we influence how we structure and use the space in order to serve both people and wild-life's interests for the near and long-term?" In order to have lasting impact, any solution must address both the ecological and societal dimension of the problem (Glaser, 2012; Carpenter, Walker, Anderies, & Abel, 2001; Miller, 2005)

These questions are particularly pressing to conservationists, natural resource managers, and urban planners in the Portland Metro region as people continue to move to the region from other states and countries drawn, in part, by the quality of life and economic opportunities afforded by the health and beauty of the region's natural capital (Houck & Sallinger, 2013). The Portland Metro area anticipates an addition 1 million residents in the next few decades (Houck & Sallinger, 2013). Already ecologists note significant and wide-spread declines among the region's fish, avian, amphibian and invertebrate populations (Houck & Sallinger, 2013) that threaten the fabric of economic and cultural practices.

Given biodiversity's importance to the community's vitality, a broad coalition of non-profit, governmental and private organizations have banded together to form the Intertwine Alliance (Houck & Sallinger, 2013). They realize that addressing the contributing social and environmental factors are too numerous and complex for any single organization to take on independently. The Alliances' strategy seeks to address the ecological and social dimension to preserving biodiversity in an integrated manner. By creating a "network of parks, trails, and natural areas" that will "protect a diversity of habitat types, plants, and animals across the urban...landscape"; while facilitating the area's residents in caring for and using the network to "connect with nature and live active, healthy lives" (Houck & Sallinger, 2013, p. 2), the Alliance seeks to create a system that a wide range of the public supports because of how it benefits not only wildlife, but them.

Two of the Intertwine Alliance partners, The Portland Audubon Society and Columbia Land Trust are taking the effort to resident's backyards. Ecologically, their goal is to increase the quality and quantity of wildlife habitat by encouraging homeowners to naturescape a percentage of their yards and to be good stewards of natural resources by practicing ecologically friendly yard care (Audubon Society of Portland, 2013). Socially, their goal is to facilitate residents in connecting to nature in their yards and neighborhood in ways that they find personally rewarding, strengthening both their commitment to and understanding of local wildlife (Clayton, 2007; Louv, 2006; Audubon Society of Portland, 2013). I am interested in identifying the drivers and barriers to naturescaping and participation in the Certification Program so that Backyard Habitat can be effective in achieving their goals in the Madison South Neighborhood. While I will address ecological issues, it will be through the lens of human activity.

Social-Ecological Systems Conceptual Framework

Using the Social-ecological systems framework highlights the challenge of shaping outcomes in dynamic, complex systems. Because social-ecological systems are conceptualized in terms of interactions between living organisms with each other and their environment, theorists advocate focusing on human activity, particularly if our goal is designing interventions (Grimm, Grove, Pickett, & Redman, 2000; Davidson, 2010). In studying both social and ecological phenomena, scale matters not only temporally and spatially (Borgstrom, Elmqvist, Angelstam, & Alfsen-Norodom, 2006; Goddard, Dougill, & Benton, 2009; Hostetler & Holling, 2000), but organizationally (Ribot & Peluso, 2003; Walker, Holling, Carpenter, & Kinzing, 2004; Goddard, Dougill, & Benton, 2013; Pelling & High, 2005; Miller & Hobbs, 2002).

In order to understand the social dimension, we need to understand both the individual scale of the 'personal experience' (Karasov 1997 as cited in Miller & Hobbs, 2002) as well as structural factors at the community scale (Ribot & Peluso, 2003). One way of approaching human action is to understand how it is mediated by our interests and agency (Wertsch, 1997; Flora, Flora, & Fey, 2004). Flora et. al. (2004) and others (Bourdieu, 1989; Wertsch, 1997) conceptualize human agency in terms of our access to different forms of capital: social, cultural¹, financial, and natural. Such an approach includes looking at how the distribution of different forms of capital shapes agency (Walker, Holling, Carpenter, & Kinzing, 2004; Pelling & High, 2005; Flora, Flora, & Fey, 2004).

Drivers and Barriers to Wildlife-friendly Gardening

According to the literature, a variety of factors interact to shape residents' interests and faculty regarding wildlife friendly gardening. One of the main motives for gardening at the individual scale is the chance to interact and appreciate nature (Clayton, 2007; Gross & Lane, 2007). Our cultural capital, or "what we know", mediates how we act on our interest (Wertsch, 1997; Bourdieu, 1989). Clayton

¹ Flora et al. (2004) breaks capital into natural, built, financial, human, cultural and social. Bourdieu (1989) combines the categories, limiting his analysis to financial, cultural and social capital. However, their definition of 'social capital' closely aligns. For this discussion, I will use Bourdieu's (1989) definition of 'cultural capital that includes embodied knowledge as well as physical cultural tools and ability to adhere to different social norms.

(2007) noted an increased receptivity to wildlife friendly gardening among gardeners with ecological concerns. Building on her work, Goddard et. al (2013)'s study found that a "moral responsibility to nature" as well as interest in observing wildlife was a primary motive for wildlife-friendly gardening. Another motivating factor for gardening was as a way of being creative and having a sense of agency in caring for plants (Clayton, 2007). However, Clayton (2007)'s study noted that lack of awareness that one could "protect... nature through sustainable practices" was a potential barrier to wildlife friendly gardening (p. 222). She noted that participants did not seem to perceive their yards as "part of an ecosystem" (p. 222), suggesting that the combination of concern for wildlife and belief in our efficacy is an important driver of wildlife-friendly gardening.

While these values and understandings may be held by the individual, social research shows how they are informed by the group (Wertsch, 1997; Bourdieu, 1989; Flora, Flora, & Fey, 2004). Thus, at the community as well as the individual level, prevailing attitudes and understandings about wildlife, their needs, and our ability to make a difference at can serve as either barriers or drivers to naturescaping (Clayton, 2007; Nassauer, 1988; Goddard, Dougill, & Benton, 2013).

Aesthetics are a set of values that significantly factor into yard-care choices (Clayton, 2007; Gross & Lane, 2007; Nassauer, 1988; Van den Berg & Van Winsum-Westra, 2010). One of the primary drivers of gardener's planting and design choices are their preference for a particular "sensory experience": the "colors, smells, beauty "and the resulting peacefulness, tranquility or pleasure that they derive (Clayton, 2007, p. 222). Nassauer (1988) found that we tend to prefer landscapes that we perceive as "cared for". This preference tends to favor "neatness", which is often a barrier for landscaping with native plants which tends to look "messy". However, when we understand the ecological benefit or perceive "intention" in the design, we are more likely to find it attractive (Nassauer, 1988). Another dimension to aesthetics shows how the personal experience of residents is informed by social dynamics at the group level. Nassauer et. al. (2009) found residents modified their landscaping preferences based on the "look" of neighboring yards. Research suggests that drivers behind a cohesive neighborhood look more than just sensory preference, but rooted in a desire to belong or "fit...in to the local community" (Clayton, 2007, p. 216; Nassauer, Wang, & Dayrell, 2009; Goddard, Dougill, & Benton, 2013). The concern for how others will judge one's yard, may be calculated; "keeping the yard nice" can be seen as a "capital investment" in the value of one's own property, "but the neighborhood" (Robbins et al. 2001, as cited in Clayton, 2007, p 216).

Two other areas that are likely to affect the likelihood of residents gardening for wildlife are maintenance concerns and desired functionality of the yard (Clayton, 2007; Goddard, Dougill, & Benton, 2013). Clayton (2007) found a negative correlation between interest in wildlife friendly gardening with practical concerns such as cost, labor, time and other investments of human capital (Flora, Flora, & Fey, 2004). However, if residents perceived gardening for wildlife as less work, then there could be the opposite relationship. Similarly, multiple desired uses for the yard could either conflict or align (Clayton, 2007).

Other Barriers that may affect program participation

In order to participate in the Backyard Habitat Certification Program, one needs to have access to a yard or other green-space that one can naturescape (Audubon Society of Portland, 2013). Access to natural capital is a limiting factor (Flora, Flora, & Fey, 2004; Davidson, 2010). Moreover, while Backyard Habitat has worked with renters that can alter the landscape, the program is designed for homeowners. Similarly, because all of Backyard Habitat's literature and out-reach is in English, English fluency could also serve as a barrier to participation.

Goals of Research Project

The purpose of this project is to identify the drivers and barriers to naturescaping and participation in the Backyard Habitat Certification Program in the Madison South Neighborhood in order to increase the diversity of the program's base and build capacity with the Dharma Zen restoration project. The desired outcome would be that Backyard Habitat could engage a broad segment of householders in order to maximize the number of naturescaped yards in and around Siskiyou Square, and to serve all those interested in the benefits of gardening for wildlife.

Based on these goals and factors identified in the literature review, I am asking the following:

Research Questions

Q1 – Who lives in the neighborhood and what land do they have access to?

- a) Where is the greenspace?
- b) Who are the renters and homeowners?
- c) What is the cultural diversity of the neighborhood?

Q2 - How receptive are residents to practicing naturescaping and the benefits of program participation?

- a) How do they perceive and value wildlife and their yards and neighborhood green-space?
- b) How do they use and maintain their yards?
- c) What would they like to do with their yard; to what degree do they find "naturescaped" yards appealing?
- d) How interested are they in the benefits and goals of the Backyard Habitat Certification Program?

Q3- What are the community organizations in the neighborhood that could serve as bridges to a broad neighborhood audience?

CHAPTER 3: Method

Given these research questions, I designed a mixed-methods study (Johnson & Christensen, 2012) that would seek to understand the neighborhood's social and ecological factors that would shape Backyard Habitat's mission-effectiveness in order to provide recommendations for engaging a broad cross-section of the community. I broke the study into three phases. The first phase included an analysis of publicly available on-line information about the neighborhood's demographics and available

Instruments & Procedures

Phase 1: Understanding Madison South –the place, its people & community resources.

Phase 1 had two purposes, one analytic and the other methodological. The analytic purpose of Phase 1 was to answer Q1 and Q3 in order to understand the cultural diversity of the neighborhood; the ecological value of private yards; structural factors, such as tenure, that would limit access; and resources for broadening participation. For a quick overview of the instruments used in Phase 1 and the research questions that they addressed, see Appendix. I will highlight the key elements below.

Mapping the habitat- *Where is the green-space* (Q1:a): To determine the value and distribution of green-space in the neighborhood, I began by using the Intertwine Alliance’s Regional Conservation Strategy (RCS) on-line habitat assessment tool with the local-level filter² (Houck & Sallinger, 2013; Intertwine Alliance, 2014). In order to understand how the high-value areas were distributed across private property, I compared the RCS overlay to Metro Map, an online tool showing tax-lots (Metro Data Resource Center, 2014). (For a side-by-side comparison of screen-shots of each tool, see Appendix.) The Metro Map tool has the added benefit of revealing vegetation type in picture form similar to satellite imagery on Google Maps. Thus one can identify a tall tree canopy from open lawns and low-level herbaceous plantings. By comparing the RCS filter and the Metro Map imagery, one can get a birds-eye of the vegetation structure of the valued habitat as well as identifying its distribution among properties.

Determining levels of access to land – *Who are the renters & homeowners* (Q1:b): One’s tenure status (renting or living in a home one owns), typically shapes one’s degree of control over how land is used (Ribot & Peluso, 2003). While landlords may establish a range of agreements with their tenants, homeowners typically have greater agency than renters in deciding how to landscape their yards (Ribot & Peluso, 2003). Similarly, homeowners may be more likely to perceive investments in landscaping as worthwhile if they believe that they will own the property as the plantings mature (Clayton, 2007). One way to understand the relationship between people and the land that would shape their ability and interest in the Madison South neighborhood was to use census data to look at the percentage of renters to homeowners. Because home-ownership is part of the criteria for how Backyard Habitat markets their services, renting likely serves as either a perceived or actual structural barrier limiting participation in the program.

² The tool assigns a value to each pixel based on an assortment of criteria including vegetation cover, patch size, and habitat type (Houck & Sallinger, 2013). A pixel’s value is influenced by the value of adjacent pixels. Thus, since hardscaped features such as roads and houses are given the lowest value, whereas tall trees are given a high-value, front-yards and corner lots tend to have a lower value than backyards because they are close to roads. The tool is designed to help Intertwine partners and other conservation planners devise long-term strategies that will balance social and ecological needs. In order to help planners at different scales, the tool has three filters: a neighborhood assessment, local assessment, and regional assessment.

Understanding the neighborhood's demographics- *What is the cultural diversity of the neighborhood (Q1:c)*: Two goals of the study were to determine barriers that may be limiting Backyard Habitat in capturing the full spectrum of cultural diversity within the neighborhoods that they serve and to explore strategies to overcome those barriers. Therefore, I used Census Data to get a sense of the potential racial and ethnic diversity of the neighborhood and to identify factors such as unequal levels of homeownership and limited English fluency that may be limiting under-represented groups from participating.

Mapping Community resources- *What are the community organizations in the neighborhood that could serve as bridges to a broad neighborhood audience (Q3)*: The final step of Phase 1 was mapping local businesses, non-profits, and other organizations that Backyard Habitat could approach in order to reach different segments of the neighborhood. I worked on this step both before and after completing the surveys in Phase 2. I was able to identify resources based on key-word searches in Google Maps, advice from a neighborhood branch librarian, and recommendations provided by study participants.

The methodological purpose of Phase 1 was to support the sampling strategy (Diamond, Luke, & Uttal, 2009) for Phase2. By knowing the tenure of each residence in advance, I would be able to limit the properties in the study area to owner-occupied homes. Portland Maps publicly provides a wealth of information on each property including the address of the owner (City of Portland, 2014). By comparing the street address to the owner's address, I was able to identify publicly owned from privately owned properties, and rentals from owner-occupied properties. I then limited my study pool to owner-occupied properties. Later, I could compare the tenure ratios to those of the census tract to determine how comprehensive my sample was of the larger neighborhood.

Phase 2 Exploring Drivers and Barriers among home owners surrounding Siskiyou Square – Door-to-door survey questionnaire with yard-type instrument:

Phase 2's primary purpose was to address Q2 and Q3 by gaining home-owner's individual perspectives on naturescaping, and neighborhood concerns and resources in order to look for trends either particular to Madison South or generalizable among homeowners.

Phase2's design consisted of a house-to-house, mixed-methods survey with open-ended, short-answer and Likert scaled questions (Johnson & Christensen, 2012; Diamond, Luke, & Uttal, 2009) (See Appendix for introductory script and questions). The survey included showing participants three sheets of photographs, each representing a different type of yard design: naturescaped, manicured lawn with highly structured and colorful ornamentals, and permaculture consisting of herbs and vegetable plantings in flower beds and raised boxes (See Appendix). I based the concept of this "yard-type" instrument on the instrument developed by Nassauer et. al. (2009) that allowed participants to choose photos representing landscaping preferences. For the sheet of naturescaped yards, I primarily used online photos from previous Backyard Habitat yard-tours. I included one photograph of a "meadow-scaped" yard(#1) since many of the yards in Madison South without established trees or shrubs could support wildflowers and grasses. Moreover, one of the ecological goals of Dharma Rain is to restore

part of their property as Oak savannah, a type of meadow(see Appendix). As much as possible I edited out details of the landscape beyond the yard such as nearby houses or views.

In order to begin to explore the range of individual drivers and barriers to participating in the Certification Program, I wanted to establish naturescaping's level of appeal among participants based on their values, perceptions, and aesthetic and functional goals for their yards (Clayton, 2007). Phase 2 focused on exploring residents' receptivity to naturescaping (Q2) as follows:

Gauging current functional demands-How do they use and maintain their yards? (Q2,b): Since the interaction of living creatures with each other and their environment is central to SES-functioning (Davidson, 2010), I started the survey with an open-ended question about animal and human activity. That way participants' awareness of who used the yard, and how, would provide context for understanding both their functional goals and how other's activity could afford or constrain their ability to achieve those goals. Since the study would focus on human activity - what residents do and why - as the mechanism for improving habitat value and participation in the certification program, I started the conversation by discussing actual yard-use.

Gauging aesthetic goals - What would they like to do with their yard; to what degree do they find "naturescaped" yards appealing? (Q2, c): Since the purpose of the study was to identify strategies for increasing participation, I wanted to expand the conversation from current yard-use to the benefits participants would ideally like to derive from the space. Then Backyard Habitat could look for ways to align desired benefits with providing desirable wildlife habitat. I conceptualized desired-use as having two dimensions: what participants would like to happen, or be able **to do** in their yards, and how they would like their yards **to look**. From a habitat perspective, both the activity within a space and the structure of that space are key to determining what wildlife will be able to use it (Goddard, Dougill, & Benton, 2009; Goddard, Dougill, & Benton, 2013). Phase2 focused on capturing desired aesthetics using the "yard-type" instrument. Because aesthetics are subjective, using photographs provided an objective way of gauging desired looks (Nassauer, Wang, & Dayrell, 2009). I could then ask participants what they liked about the photos that they chose as well as the suitability of the instrument in capturing their desired look. I hoped that this, combined with the opening question about how people and animals use their yard, would encourage broad conversations about what they wanted to do in their yard as well as how they wanted it to look.

Gauging alignment with Backyard Habitat's conservation goals -How do they perceive and value wildlife and their yards and neighborhood green-space? (Q2, a): Backyard Habitat encourages naturescaping by emphasizing how it can serve as a means for attracting and benefiting wildlife (Audubon Society of Portland, 2013). Thus Likert-scaled questions were designed to assess participants' interest in wildlife and beliefs about the impact of landscaping on wildlife abundance (See appendix). Based on Clayton's (2007) research correlating ecological concerns and belief in one's efficacy with sustainable gardening practices, I suspected that if participants shared Backyard Habitat's wildlife-conservation goals and believed that how they planted and cared for their yards mattered, then they would likely be more receptive to doing the work of naturescaping.

Collecting recommendations on how best to serve the neighborhood - *What are the community organizations in the neighborhood that could serve as bridges to a broad neighborhood audience (Q3)*: As already described, Phase 2 was designed to support Phase 1 in identifying strategies to connect with a broad cross-section of the neighborhood in order to serve all interested parties. I asked participants about neighborhood resources to which they would direct a neighbor interested in attracting wildlife, and ended with a catch-all question about any personal questions or concerns or issues specific to the neighborhood that Backyard Habitat should know about in order to better serve them or the neighborhood.

Gauging tenure expectancy and cultural diversity of participant pool- *Demographical data*: The demographical data that I collected from participants was designed to understand the survey results in the context of Q1. I wanted understand how long they planned on living at their residence since their tenure would determine their access to the yard. I asked them an open-ended question about ethnic identity so that I could understand the diversity of my sample and have some context to be able to compare it to the neighborhood demographics.

Phase 3: Quantifying and Clarifying emergent drivers and barriers – Follow-up phone interview with survey participants interested in attracting wildlife.

Phase3 interview questions and Likert scale instrument were designed³ based on the Clayton's (2007) gardening motivation instrument and my personal experience naturescaping. I designed the instrument to clarify and quantify the potential motives and obstacles to naturescaping that emerged in Phase2 among participants interested in attracting wildlife (See Appendix). I sought to interview up to 15 participants that rated their interest in "seeing wildlife" either at the highest or second-highest level on the surveys, but that collectively represented a broad range in aesthetic preferences for yard-design. I aimed to get 5 participants for each of the three yard-types so that I could identify strategies to engage a broad range of aesthetics. A second purpose of Phase 3 was to explicitly ask to what degree participants were interested in the benefits and goals of the Backyard Habitat Certification Program (Q2,b).⁴ I read the description of the program from its website (Audubon Society of Portland, 2013) and asked participants to rate the degree to which they agreed with the program's goals and the degree to which they were interested in participating in the program. I then requested that participants explain their answers.

Data Analysis:

Phase 1: To answer Q1: *who lives in the neighborhood and what land do they have access to*, I tabulated quantifiable demographic data from the census presenting it in graphs, and presented ecological data

³ I modified Phase 3's interview based on my analysis of Phase 2 responses. I similarly modified the Phase 2 survey based on initial responses.

⁴ Because the study was exploratory, I had asked them generally about attracting wildlife in Phase 2 in order to minimize influencing their responses by suggesting that there was a right way (i.e. through Backyard Habitat) or wrong way to do so. I only mentioned Backyard Habitat by name at the end of the survey. Another reason to delay in asking explicitly about their interest in the Backyard Habitat Certification Program until Phase 3, was that I needed to keep the survey to 7-10 minutes and it was already averaging that time limit when I tested it on friends and family.

graphically (map print-outs) and in narrative form. To answer Q3 - *what are the community organizations in the neighborhood that could serve as bridges to a broad neighborhood audience*, I mapped community organizations using Google Maps and provided contact information and brief narrative descriptions of their services as gleaned from web-sites and, in some cases, confirmed by phone.

Phase 2: I tabulated quantifiable responses using Microsoft Excel and presented results in graphs. I coded qualitative responses for evidence of *barriers* and *drivers* to naturescaping and program participation, and *community resources* that could facilitate desired learning and access to materials. The motivation for one type of gardening, such as “having a yard that fits” with the neighborhood, could be either a *barrier* or *driver* to naturescaping depending on what the participant perceived as the neighborhood norm (Nassauer, Wang, & Dayrell, 2009). Consequently, my coding was contextual and informed by non-verbal communications as well as verbal. I then assigned descriptive categorical terms, such as “aesthetic-social norm” to each barrier or driver to look for emerging trends. These terms were informed by drivers and barriers identified in the literature (Clayton, 2007; Goddard, Dougill, & Benton, 2013; Gross & Lane, 2007; Nassauer, 1988) and my personal experience. I would then use these categories to inform Phase 3’s Likert questionnaire.

Phase 3: Similarly to Phase 2, I tabulated quantifiable responses using Microsoft Excel and presented in graphs or narrative form. Open-ended questions about participant’s agency in “getting the yard that they want” were used to verify that the Likert-scaled questionnaire captured all the relevant drivers and barriers.

Results & Findings:

Response rate:

Phase 2: My goal had been to collect surveys from up to 85 of the 318 households in the study area excluding all the “no-soliciting” yards (19). However after I only obtained 28 participants going door-to-door. I received 27 declines, 2 of which were due to language barriers.

Phase 3: Due to time constraints and a smaller than expected participant pool, I only got 4 follow-up interviews. All had a high interest in seeing wildlife (rated “4” on survey Q#6 on Likert scale) and believed that how we landscape and maintain our yards matters (2 rated “3”, and 2 rated “4” on Q#7). All but one interviewee rated the sheet “A” with naturescaped yards as the most desirable. The other interviewee rated sheet “C” with food-garden yards as most desirable. These interviews neither reflected the intended range of yard-style preferences, nor were reprehensive of the group. However, they were still useful in identifying and clarifying barriers and drivers to naturescaping and program participation.

Q1: Who lives in the neighborhood and what land do they have access to?

Where is the green-space? According to the RCS overlay at the local level, some of the ecologically highest valued land in Madison South is the heavily forested area of Rocky Butte just east of the survey study area (Houck & Sallinger, 2013; Intertwine Alliance, 2014). While much of that property is publicly

held, residential properties 1/3rd acre or smaller line the road that winds through the park area (City of Portland, 2014). The backyards of some of these properties carry the highest possible rating of purple) on RCS's local filter.

As we move west toward Siskiyou Square, several properties are marked with the pink “high value” rating. These areas are in the center of blocks where backyards with trees abut, creating a collectively large patch. One of the single properties with the largest concentration of “high-value” land is the Siskiyou Square parcel purchased by Dharma Rain Zen Center. Dharma Rain plans on conserving these high value areas as “woodland and riparian habitat” (Gyokuko, 2014) (See Appendix).

When one “zooms out” and looks at the available green-space in both Madison South and neighboring Roseway, one notices that Dharma Zen’s parcel and its neighboring parcel provide key connectivity between the Rocky Butte Habitat area that includes Gateway and the Grotto, and the Rose City Park & Golf Course Habitat area that includes Madison High and Glenhaven Park (Gyokuko, 2014; City of Portland, 2014).

Returning to the study area surrounding Siskiyou Square, the highest valued land is concentrated in blocks 6-12 closest to

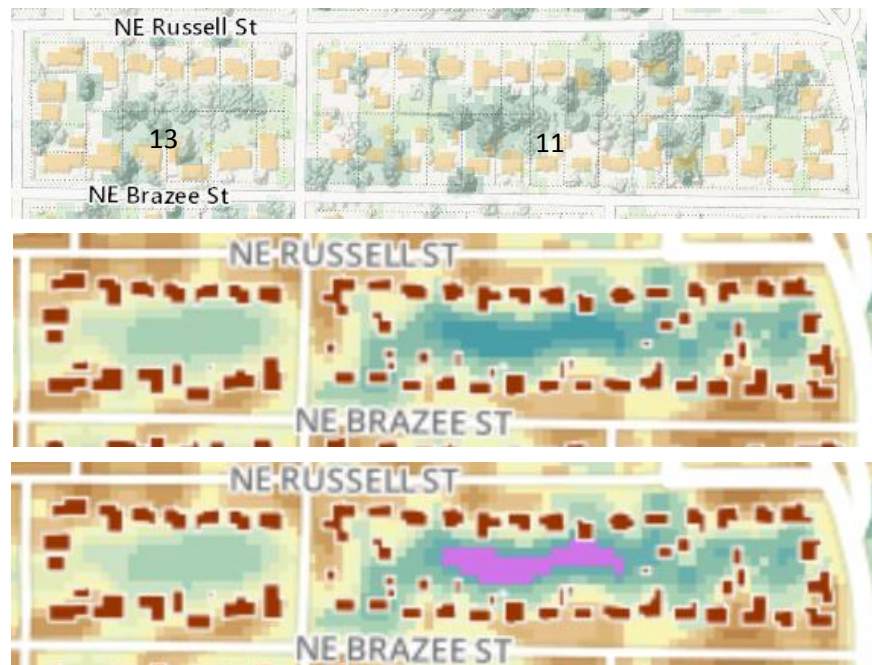
Rocky Butte (See figure 1; Appendix). From walking the entire area during Phase2 and comparing the properties using Metro Map

(Metro Data Resource Center, 2014), the biggest difference between these properties and those closer to 82nd Ave appears to be the

presence of mature trees, particularly tall Douglas fir.

For example, when we

compare block 13 and 11 in Metro Maps, the yards have comparable planting area. But block 11’s higher concentration of tall firs gets a significantly higher rating that shows up prominently when the pink “high value” filter is added⁵.



⁵ The RCS could be a useful tool for Backyard Habitat in communicating with interested residents since it shows the collective value of adjoining backyards. However, a closer examination of the tool reveals its limitation for

These findings are relevant to the study for several reasons. The maps illustrate that most ecologically valuable land is not evenly distributed, but concentrated around parks. They also highlight the high value of stands of tall trees in private backyards, and the value of collectively large patches where backyards abut.

What is the cultural diversity of the neighborhood?

According to the 2010 Census, Madison South, like the greater Portland Metro Area, is predominantly White. However, it is a relatively diverse neighborhood within the Portland area with proportionately more people with African American, American Indian, Native Hawaiian, and Asian ancestry. Madison South has a slightly lower percentage of Hispanic and Latino residents, but otherwise appears to be a good neighborhood for Backyard Habitat to engage if they wish to diversify their participant base.

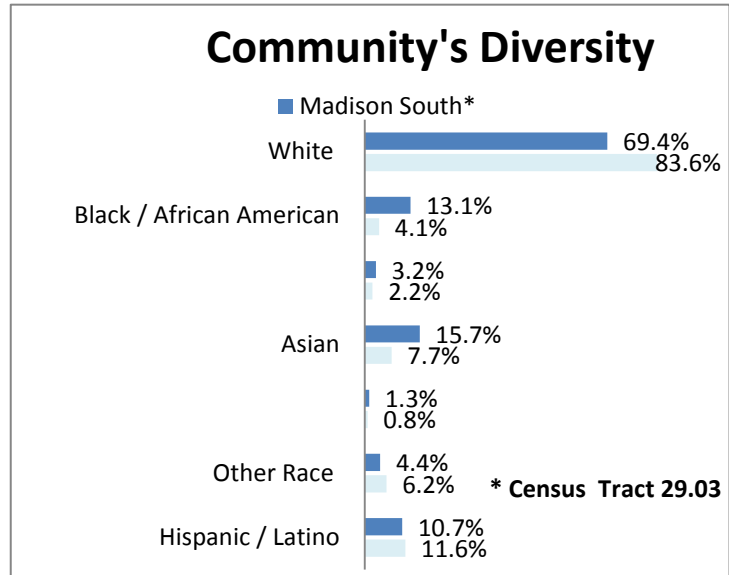


Figure 3 Diversity based on Race alone or in combination (US Census Bureau, QT-P5, 2010) and Hispanic or Latino origin (ACS-5yr, B03003, 2012)

Who are the renters and homeowners?

backyard habitat planning. Since it heavily weighs tall trees, it minimizes the value of other habitat types such as meadowscapes or shrub hedgerows. Therefore, it should be used cautiously so as not to discourage residents with no tall “high-value” trees.

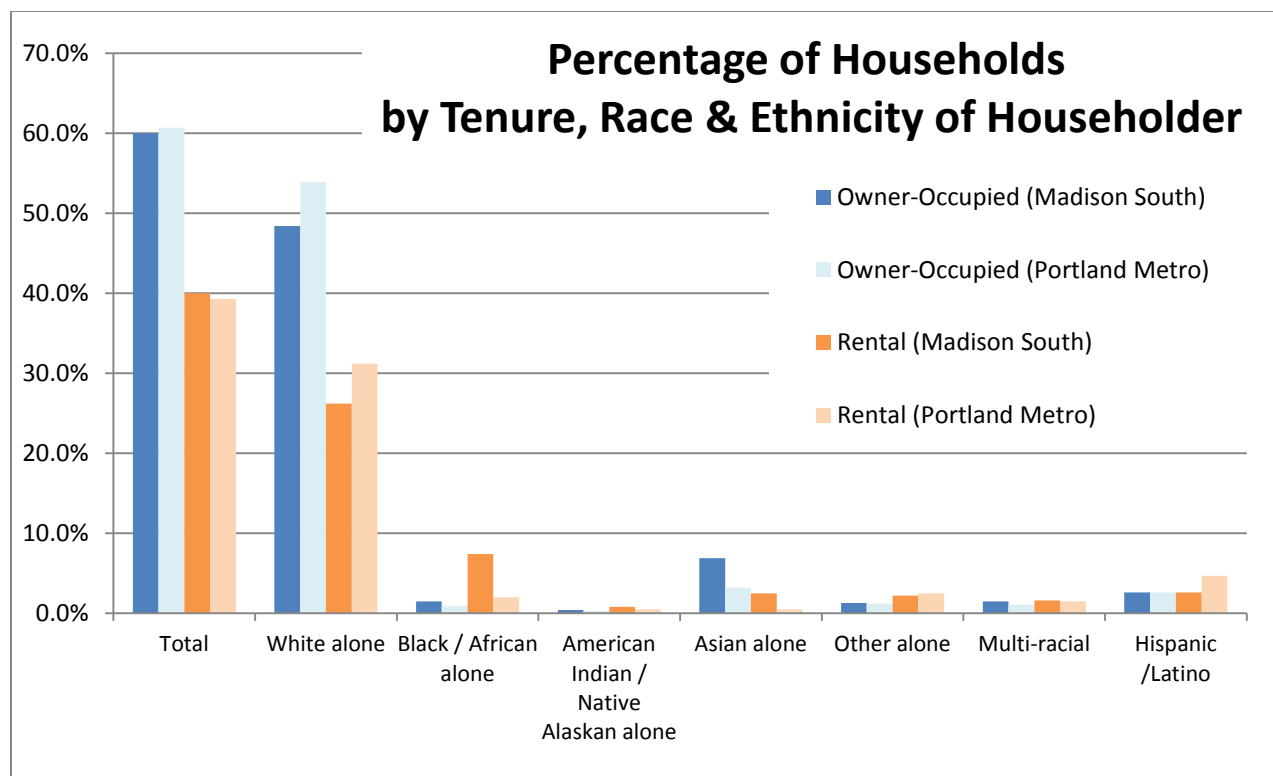


Figure 4 Tenure by Race of Householder (US Census Bureau, 2010) and Tenure by Hispanic or Latino Origin (US Census Bureau, 2010)

In Madison South⁶

Since program participation is primarily limited to homeowners, we need to understand the neighborhood's diversity in terms of tenure-status. The proportion of households owning their homes in Madison South is comparable to the greater Portland Metro area (60.0% vs 60.7%). Also like Metro, home-ownership is not evenly distributed among racial and ethnic groups, with a disproportionate number of Whites and Asians owning their homes and a disproportionate number of Blacks and American Indians renting.

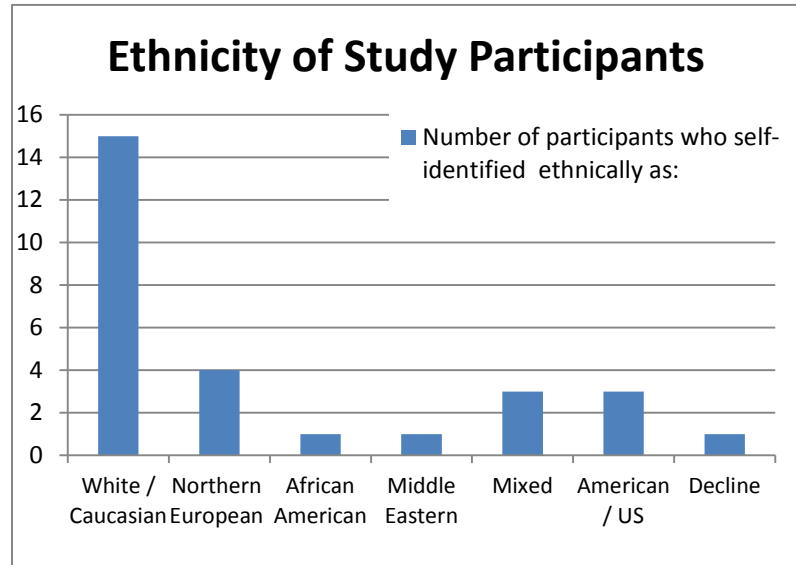
However, Madison South has a unique dynamic that Backyard Habitat needs to consider in terms of strategies for diversifying their base and gaining wide-spread access to yards. Even though home-ownership among African-Americans is on average higher throughout Portland Metro (32.6% vs. 16.5%), a slightly higher percentage of owner-occupied homes in Madison South are owned by African-Americans (2.4% vs. 1.6%) due to the greater concentration living there. A significantly higher number of the neighborhood's owner-occupied homes are Asian owned (11.6% vs 5.3%). All combined, nearly 20% (19.3%) of the owner-occupied homes have bi-racial or racial minority owners. Also significant, even though the neighborhood has a lower than average percentage of Hispanic and Latino residents, a

⁶ By "Madison South" I am referring to census tract 29.03.

greater percentage of them own homes. Consequently, 4.4% of the neighborhood's homeowners are Hispanic-Latino, matching the Metro average.

How does the Study Area Compare?

Since I asked study participants open-ended questions about their ethnic identity rather than copying the Census form's racial category checklist, I cannot easily compare the study participants to neighborhood demographics to see if they were representative. However, we can make some general inferences. If we combine the participants with Northern European ancestry and the "White" responses (19/24), the participant pool closely resembles the neighborhood estimate for the percentage of homeowners that are White (79% vs 82%)⁷.



The study area had a slightly higher rate of owner-occupied homes compared to the neighborhood as a whole (65.4% vs 60%) (City of Portland, 2014). Looking at how tenure is distributed within the study area reveals the statistical impact of apartment complexes. When we exclude the Madison Place⁸ town-home rental complex that comprises most of blocks 14 & 12, the percentage of owner-occupied homes increases to 73.5%. Otherwise, renters and homeowners were fairly well distributed throughout the study area (see Appendix for percentage of owner-occupied homes by block). Many of these renters and homeowners lived in single-family homes with similarly sized yards that are characteristic of the neighborhood (See MetroMaps overlay in Appendix).

Q2 - How receptive are residents to practicing naturescaping and the benefits of program participation?

How do they use their yards?

Participants described a wide range of uses for their yards that often included a mix of human, pet, and wildlife activity. Nearly all participants (26/28), described some use or activity other than

⁷ This statistic is derived by discounting the number of participants that declined or answered "American" or as from another geographical location in the US. i.e. "West Coast".

⁸ For a Google Street-view of Madison Place's luxury plexes, visit <https://www.google.com/maps/@45.54094,-122.576314,3a,19.8y,67.24h,85.02t/data=!3m4!1e1!3m2!1s3idWxsVsOtrIAsoKGL2vog!2e0> The plexes are owned by several owners, however only one unit is owner-occupied (PortlandMaps)

general maintenance that had them spending time in their yards. Half of all participants (14) described “growing food” as a use for at least part of their yard. Other specific uses included “growing flowers” or gardening in general (10), “entertaining” (8), “BBQ” or “eating outside”(9), active games or “kids playing” (8), “relaxing” (6) and having privacy (3).

Pets also factored significantly into how participants used their yards. More than a third of participants (11) described the yard, or at least a portion of it as a place to let the dog out, in some cases precluding other uses. Fewer residents (4) described letting their cats outside. Equally common were chickens (4). Often wryly, participants (5) described neighborhood pets wandering through their yards, hunting, or using them as a litter-box.

Awareness of the presence of wildlife and their use of neighborhood yards for habitat was high. In fact, 86% (24) described wildlife as either passing through, coming for food, or seeking shelter in their yard. Several participants (5) cited “watching wildlife” as a specific use for their yard. More significantly, 54% of participants (15) described doing something to purposefully attract wildlife whether it was hanging a birdfeeder, installing a habitat feature such as a bird bath or house, or planting specifically for humming birds and pollinators. Of these participants, 13 described purposefully “planting” or “maintaining trees” for wildlife; and 4 specified that they either had or intended to use natives.

How do they perceive and value wildlife and their yards and neighborhood green-space?

When expressly asked to quantify their interest in “seeing birds, butterflies, or wildlife in [their] yards or neighborhood”, even more participants expressed high interest with 86% (24) responding “very much” and everyone⁹ else responding “pretty much”. However, many participants made a distinction between desirable “birds and butterflies” and undesirable “rats”, “raccoons”, and “coyotes” often explaining that they were a health-risk or threat to their pets. Some (2) described no-longer composting or using birdseed to discourage “pests”. Some described hawks unfavorably because they were seen as threat to chickens (2) or song-birds (1) and wanted to know ways of discourage them from hunting in their yard. Participants most frequently described trying to attract bees and birds, particularly humming-birds (5). However, many participants also described “enjoying the antics” of squirrels and of putting out feeders.

Participants expressed a slightly less strong belief that the way “we landscape and maintain our yards” matters for the “presence of ...wildlife” with 61% (17) asserting that it mattered “very much”, and everyone else but one saying it mattered “pretty much”. That one person said it only mattered “somewhat”. The participants who described intentionally doing something to attract wildlife in their yard (54%) rated the importance of landscaping at a slightly higher rate (73% gave a top rating of “very much”) than the general group. However, one participant who rated her interest in seeing wildlife as

⁹ Two of these participants rated their interests as “2” or “somewhat” when speaking of wildlife in general. They were among the participants that distinguished between “good” and “bad” wildlife. Both of them said that they were a “3”, or “pretty much” interested in seeing birds and butterflies.

“pretty” high, but believed that our landscaping choices were “very” important to the presence of wildlife, explained that she hadn’t done anything to attract wildlife because 1) she was “not-a yard person”, and 2) was more concerned about the presence of wildlife as a bell-weather for environmental health than as a desire to “sit and watch birds at a feeder”. She later described the crows and other neighborhood wildlife with “interesting social lives” that she enjoyed “observing”, as “opportunistic” and able to “take care of themselves.”

Those expressing both a “very” high interest in watching wildlife, and a “very” strong belief in the importance of yard-care to their presence were disproportionately those who rated their most preferred yard-type as “C” (permaculture or veggie garden – yards) or combination of “C” and one of the other yard-types (See

#2: yard-type that would most like for current yard	#6 gave top rating for interested in seeing wildlife	#7 gave top rating for importance of yard-care to wildlife
A	85% (5/6)	50% (3/6)
B	63% (5/8)	50% (4/8)
C	100% (8/8)	63% (5/8)
A+C	100% (4/4)	75% (3/4)
A +B +C	100% (2/2)	100% (2/2)

Figure 5:

Figure 5). In fact, the participants most likely to give a high rating for each category were those who so strongly wanted their yard to serve multiple functions that they could not choose a single “yard-type” to capture what they “most” wanted their yard to look like.

Many participants (5) volunteered stories of personal encounters with wildlife or specific observations of their behavior in explaining both their interest as well as landscaping choices. One participant described regularly planting fuchsias for a humming bird that only stopped coming to her yard when she “didn’t get to it one year”. Another described installing a “small pond for a pair of mated mallards that visit yearly”.

A participant who grew up in the neighborhood, described fond memories of the wildlife that used to be more abundant, and the awe he and his dad shared at a poignant sighting of a rare indigo bunting at their feeder. He described his commitment to preserving part of his family home for wildlife based on concern for their well-being as well as a need to take care of the environment, and as a legacy of his dad. Similarly, others described gardening as “a way to connect with the Earth” as well as the animals, and of “wanting to learn about natives as a way of connecting to the area.”

Many participants also expressed interest in the neighborhood’s green-space, particularly “the Butte” and Siskiyou Square, often attributing the “huge numbers” of wildlife and “quiet” “secretiveness” of the neighborhood to the large amount of green-space. While participants overall favored Dharma Rain’s development plans, particularly in lieu of the Wal-Mart that could have been built, 39% (11) voiced either awareness of or concern for the coyotes that were “being displaced”. While some, considering them dangerous and a threat to neighborhood pets, preferred that they be “humanely relocated”, other’s appeared to consider them part of the “wildness” that made the area “special”. One described purposely leaving out food for them figuring it was better “than having them eat cats.”

Others described the owls and hawks as a unique part of the neighborhood and attributed their presence to “the Butte” and the neighborhood’s tall firs.

What would they like to do with their yard; to what degree do they find “naturescaped” yards appealing?

As participants wanted a lot of different uses for their yards and thought of different parts of the yard (i.e. front, back) as serving distinct functions, many had a hard time choosing just one desired yard type. When given freedom in describing how they would ideally like their current yard to look, over 50% of participants choose a combination of naturescaped and permaculture yards. Zero participants choose exclusively naturescaped yards, while 75% wanted a yard that included at least some vegetable garden boxes. Having at least some lawn was important to 30%.

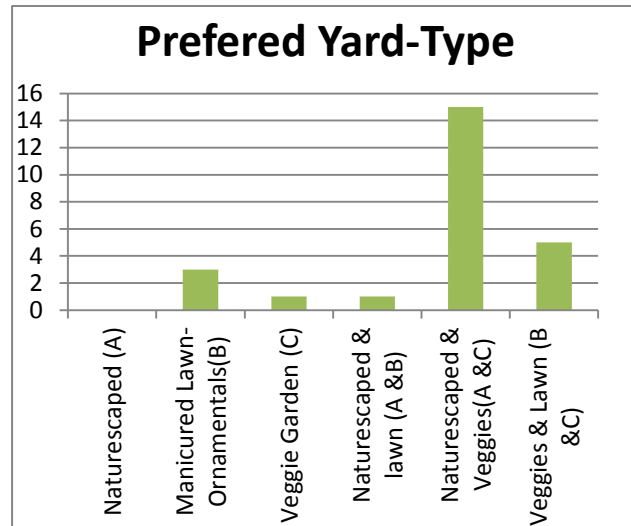


Figure 6

Preferences - drivers

In describing their choices, participants favorably described naturescaped yards as “natural”, “wild”, “free” and “butterfly-bee -friendly”. Some described their intention to “get rid of the [lawn]” so that their yard would require “less maintenance and watering”. The sheet depicting manicured lawns and ornaments was favorably described as “orderly”, “colorful”, “having plenty of space to play” and “pleasing to walk on.” Some described it as “fitting the neighborhood” or “reminding them of where they grew up.” Describing their preference for permaculture or yards growing vegetables, participants cited the desire to grow their own food, “being able to forage”, and “sustainability”. Others described liking the orderliness and “practicality” of the planting boxes and “the use of bark-chips.” Several, in describing their desire for a mixed-use yard, referred holistically and philosophically to the ecological community using terms such as “edibles for everyone”, and “one seed for the bird, one seed for the worm, and one seed for yourself.”

Concerns - barriers

Many participants also qualified their disinterest or conflicted interest in certain yard styles. Lack of interest or concern ranged from practical considerations to active distaste. When choosing a sheet that reflected their preferred yard-type, several participants volunteered what they did NOT want their

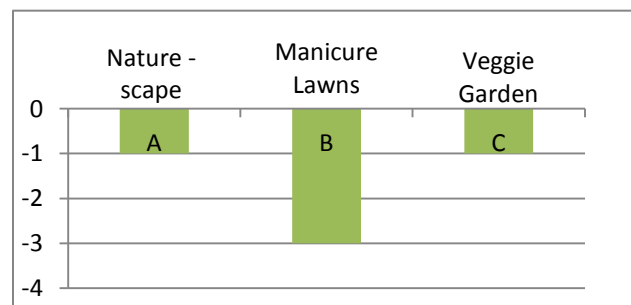


Figure 7 Participants who expressed actively rejected a particular yard-type

yards to look like. Sheet “B” with manicured lawns and ornamentals was most frequently (3) rejected as “unattractive”, “too sterile” or “suburban.” The participant who rejected “A” did not explain why, however other participants qualified their interest in naturescaped yards with “if done-right”, or potentially “messy” and “chaotic.” The participant who rejected the permaculture yard (C) said that they “were too much work”. Several participants who said they preferred the naturescaped or permaculture yards, acknowledged that they would be unlikely to create the look due to time-constraints, “having a black-thumb”, or concerns about maintenance and watering demands.

Degree that Yard-Type Instrument reflected their interests

When asked if there was any other “look” not shown that they would prefer, the 64% (18) answered “no”, that the sheets “pretty much captured it.” Participants who were not satisfied, described the following “looks” or design features that they would want: “Japanese or Mid-century modern”, more “hard-scaping” or “outdoor living features”, “animal friendly yard” i.e. “farm-pets”.

How do they maintain their yards? (Phase 3)

Based on the survey responses, I refined Phase 3’s Likert-scale for drivers and barriers to include any maintenance-related issues that emerged during Phase 2. Due to the limited number of responses for Phase 3, I did not address maintenance as explicitly or in as much detail as I had intended. However, from information that survey participants volunteered and the four interviews, I was able to gather some details about their routines and motives not described above. “Mowing, weeding, and pruning” were yard-routines cited by all interviewees. Two described fertilizing-as-needed. Avoiding the use of pesticides & herbicides was rated as either “3 -pretty important” (2) or “4-very important” (2) among interviewees. A fifth survey participant described being very “anti-pesticide” because of health issues. Health issues, specifically allergies (2), were cited as a reason for reducing the number of flowers or limiting their ability to do yard-work. Having a yard that required “little watering” was “pretty” important to most of the interviewees (3 out of 4). Similarly, having a yard that “required little mowing” was either “pretty” or “very” important to the same three. The remaining interviewee, who described already naturescaping most of her yard, did not object to maintenance demands in order to have the yard that she wanted.

How interested are they in the benefits and goals of the Backyard Habitat Certification Program?

Phase 3 was designed to explicitly gauge support for Backyard Habitat’s ecological goals and interest in participating in the program. Again, due to low response rate, I have limited results to share. Three interviewees gave a top rating¹⁰, saying that they “strongly agreed” that they shared Backyard Habitat’s goal of “conserving land and wildlife by removing aggressive weeds, creating wildlife habitat and gardening responsibly”; the forth gave a lower response of “somewhat agree”.

However the first three showed lower interest in participating in the program, saying that they only “somewhat agreed” in “seeing a benefit for themselves.” All three explained that they had

¹⁰ On a Likert scale of 0-3 with “0” = “strongly disagree” and “3” = “strongly agree”

“already started the process”. One commented that she “wished [Backyard Habitat] had been around 8 years ago when [she] started out” but was “now pretty set.” However, she later volunteered that she would “love to get specific advice for some problem areas.” Another participant explained that she already understood “most of what [she] needed to do”, and “would need to learning more about the program”, but would be interested “if it could help [her] identify specific plants”. The forth participant (who had expressed only moderate support for the goals) did not see a benefit because he “preferred learning independently”.

As a counter-point, a survey participant who did not participate in Phase 3 indicated great interest in the Certification Program saying that she had participated in a similar program in another state and that it would be “fun” to “get a bunch of neighbors together to do it” so that they could “have plant exchanges” and learn together.

Q3- What are the community organizations in the neighborhood that could serve as bridges to a broad neighborhood audience?

When asked questions relating to community resources that they 1) would direct a neighbor to who was interested in attracting wildlife, 2) had used personally, and 3) would recommend Backyard Habitat approach in order to reach interested neighbors, participants listed a wide range of community assets that included civic and non-profit organizations, businesses, special events, demonstration gardens and natural areas, and local knowledge. I have tabulated their responses below revealing 1) their level of awareness of the Backyard Habitat Certification Program and its sponsors; and 2) other community resources that could facilitate learning and access to materials for wildlife-friendly gardening¹¹. While participants varied in how many resources they suggested for wild-life friendly gardening, only one person offered none¹².

Awareness of the Backyard Habitat Certification Program:

39% study participants (11) mentioned Audubon, Leach Botanical Garden, having visited one of their native plant sales¹³, or another form of outreach or service directly associated with Backyard Habitat and its sponsors. The information participants volunteered revealed their level of familiarity with aspects of the program, and the gaps in that knowledge. Audubon had a lot of name recognition with a third (9) of participants mentioning it by name as source for learning about wildlife friendly gardening. A few (3) participants didn’t name Audubon but were familiar with their services¹⁴. Two

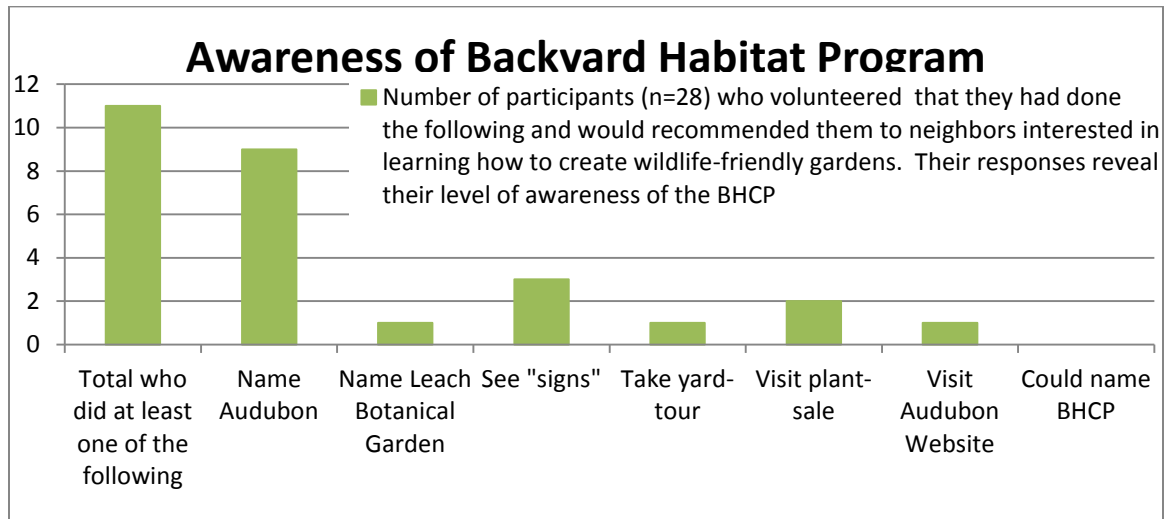
¹¹ For a complete itemized list see Appendix B

¹² Although I tabulated the number of participants that responded a specific way, it is important to remember that this study was exploratory and questions were open-ended. Thus the results capture knowledge and interests that they participants volunteered or that I clarified. Omission does not confirm lack of knowledge except where explicitly clarified.

¹³ Based on the context of their responses, I am certain that these plant sales were associated with Audubon’s sale at their location in Forest Park and at Leach Botanical Garden.

¹⁴ For example, the bird “sanctuary near the zoo”

other participants described “seeing [yard] signs” and “taking a yard-tour”¹⁵ respectively, but neither of them attributed them to Audubon or mentioned Audubon as a source in another context. Audubon is not the sole sponsor of Backyard Habitat. However, it appeared to be the most widely known. No one mentioned Columbia Land Trust.



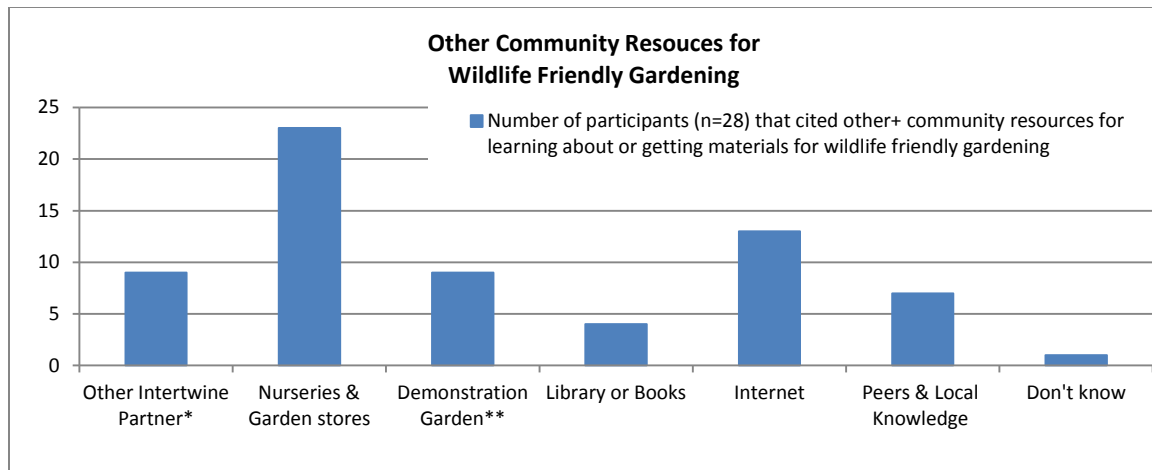
Neighborhood resources for materials and learning:

Participants most frequently (80%) cited nurseries and garden stores as a resource for learning about or getting necessary materials for creating wildlife friendly gardens with half (16) specifically naming one or more local businesses¹⁶. Mentioned in order of frequency were Portland Nursery (10), Dennis’s 7 Dees (4), and Backyard Bird Shop (3)¹⁷. Many participants cited local nurseries or garden centers as a place of learning as well as supplies. Participants explained that at Dennis’s 7 Dees offers design advice and that Portland Nursery and Home Depot offer classes.

¹⁵ The participant described the yard-tour as a “water conservation tour.” East Multnomah Soil and Water Conservation District (EMSWCD) is an Intertwine Alliance member like Portland Audubon and Columbia Land Trust. EMSWCD runs an education program similar to Backyard Habitat, offering naturescaping courses and native plant sales. EMSWCD and Backyard Habitat have co-hosted an annual tour of model yards participating in their programs. Therefore, it is possible that the participant did not attend any Backyard Habitat Certified yards the year that she attended the yard tour. (This year, 2014, even though EMSWCD ran the event, all the shown yards were Backyard Habitat certified. <http://emswcd.org/workshops-and-events/naturescaped-yard-tour/>)

¹⁶ I suspect that nearly all participants would have answered positively if asked expressly about nurseries since several who did not list nurseries as a resource, offered practical advice such as “going out and getting flowers” or “attracting with plants” as a way to create wild-life friendly yards¹⁶. Since all but one participant had answered that our landscaping affects the presence of wildlife either “pretty much” or “very much”, I suspect that nurseries and garden stores were taken for granted as a beneficial resource since there appeared to be wide understanding that what one plants matters.

¹⁷ For a complete itemized list, see appendix B



+ By “other”, categories do not include resources listed above that are affiliated with the Backyard Habitat Certification Program. For example, references to Leach Botanical Garden were not counted under “Natural Areas” because Leach is part of Audubon which runs Backyard Habitat.

*Includes only non-profit and governmental environmental education partners. Does not include business partners that could be listed under other categories such as “nurseries”

**Includes Dharma Zen Rain Center and the Beech St. Community Garden even though they are still in the process of being built. Does not include Leach Botanical garden or yard-tours since those were tallied in *Awareness of Backyard Habitat Program* graph

Peer or locally sourced knowledge emerged as another common way of learning. A quarter (7) of participants answered that a resource for learning about wildlife friendly gardening was seeking out the advice of a neighbor with expertise or “neighborhood knowledge”. One participant listed community centers as places to learn since one could “connect with other residents.” Another described purposely seeking out the advice of a landscaper friend, while others described the process more fluidly. One participant said he would “ask around, and knowledge would flow [his] way.” Interestingly, two of the participants that gave the fewest number of resources for learning about wildlife-friendly gardening cited “asking someone nearby” or “word of mouth” among their answers. This suggests that asking a peer who demonstrates expertise might be an entry point to learning about a topic.

Discussion:

Potential Ecological & Social Impact:

Serving ecological goals

While most of the ecologically highest valued land in Madison South is publicly owned, private property owners control significant habitat in the neighborhood (PortlandMaps, 2014). According to the RCS (Houck & Sallinger, 2013), the highest valued private parcels are the yards and undeveloped lots abutting publicly owned Rocky Butte. However, the Siskiyou Square properties not only provide a large ‘patch value’, but offer key connectivity between Rocky Butte and the Roseway Park & Golf Course

habitat area¹⁸. Neighbors' accounts of coyotes and the abundant wildlife that habit the area further suggest Siskiyou Square's importance. It is one of these two parcels that Dharma Rain Zen Center purchased. Although they plan on reserving 1/3rd of the property wildlife habitat, their development will likely displace some wildlife, at least temporarily. Engaging neighbors in naturescaping their yards and preserving tree-canopy can serve to enhance the Square's patch and connectivity value, ideally allowing the diverse and abundant wildlife that participants described to persist.

Some of greatest value may be getting adjoining neighbors to collectively naturescape their backyards. If they use plants from a similar plant community, such as woodland understory plants in the vicinity of the large Douglas firs, they will enhance its patch value and thus habitat impact (Goddard, Dougill, & Benton, 2009). The RCS filter appears to give lower value to open grassland. However, considering neighbors proximity to Siskiyou's meadow and Dharma Rain's development plans that will reduce its size although enhancing portions of it as native Oak Savannah, Backyard Habitat could facilitate neighbors in meadowscaping sunny parking strips and yards.

Meeting goals to diversify participation

Based on the relative diversity of the neighborhood, Madison South will be a good neighborhood to work within with the goal of broadening participation. However, there are several factors related to tenure that Backyard Habitat will need to consider as they seek access to a wide percentage of yards, to engage a representative neighborhood cross-section, and to diversify their participant base. While the majority of resident homeowners are non-Hispanic Whites (81%), to have wide access to owner-occupied yards, Backyard Habitat needs to address cultural barriers that may limit Asian, Hispanic, Latinos, and other racial and ethnic minority homeowners that control access to the other 19% of yards. Similarly, if Backyard Habitat wishes to engage a culturally representative cross-section of the neighborhood, then they need to figure out how they can make their program more appealing and accessible to renters in the neighborhood.

Using a social-ecological lens to look at how Backyard Habitat's and interested resident's agency is intertwined reveals several factors. In order for Backyard Habitat to increase the amount of naturescaped private yards, they need to inspire and facilitate residents in doing so. In order for that to happen, they need to be known, appeal to resident's interests, and make naturescaping and participating in the program feasible. The study identified some of the drivers and barriers to naturescaping and program participation that will help Backyard Habitat in addressing these three areas for the Madison South neighborhood.

Being Known:

Name recognition for the Backyard Habitat Certification Program appeared to be low to non-existent among participants. In fact, the two people who cited "signs" that they had seen as a possible

¹⁸ Since the Siskiyou Square properties are rated with significantly less highly valued green-space, I suspect that the RCS filter does not reflect Siskiyou Square's connectivity value.

resource “did not know the [program] name¹⁹.” One person even said “I see the signs for backyard habitat, but don’t know” who runs the program. A third of participants (9) explicitly stated that “better outreach” would help be a way for Backyard Habitat to better serve the community, many offering neighborhood-specific suggestions for how to do so.

Several who were already planting their yards with natives for wildlife opinioned that if they had known about the program when they first started landscaping, they would have been interested in participating. However, now that their yards were established, they didn’t see a benefit. Thus not only being known, but being known at the opportune time when homeowners are looking for ideas and materials to help them create a desirable yard, is critical to engaging residents²⁰.

Backyard Habitat’s program design capitalizes on neighborhood knowledge for both visibility and inspiring others to participate. Certified yards get a sign that the resident can publicly display. It was likely one of these signs that two study participants referenced as a source for learning about attracting wildlife. The sign can then serve as a conversation-starter among neighbors as they see each other out in the yard (Clayton, 2007). Backyard Habitat’s annual yard-tour also provides residents interested in the program a chance to get ideas and connect with the yard-host experts. Continuing to look at ways to facilitate the sharing of knowledge at the community level will likely be advantageous for program visibility, communicating the goals and techniques of naturescaping, and inspiring other residents to participate.

By knowing what businesses neighborhood residents use, Backyard Habitat could seek to create mutually beneficial partnerships. Backyard Habitat could approach these businesses about publicizing the program and carrying appropriate native plants. In return, Backyard Habitat could encourage its participants to seek out these businesses. Portland Nursery, which was most frequently mentioned by name, would be an appropriate place to start. While not named by as many, Gateway Fred Meyers could also be a valuable business to approach if it, as opinioned by one participant, serves a broader segment of the neighborhood. Every year Fred Meyers hosts a *Fuchsia Saturday*, filling customers’ planters with soil for free when they purchase one or more plants²¹. One participant suggested that Backyard Habitat table the “well-attended” event handing out fliers and possibly a free plant as a way to publicize their program. Given the high interest participants expressed specifically in attracting humming birds (see Appendix), *Fuchsia Saturday* might be a great opportunity for Backyard Habitat to introduce residents to low-maintenance natives, such as flowering red current, that could attract hummingbirds.

¹⁹ National programs such as Wildlife Federation also certify yards. It is possible that the signs that the participants had seen were for a program other than Backyard Habitat. However, I noticed at least one Backyard Habitat Certified yard within several blocks of these participants’ homes.

²⁰ According to many participants, there has been a recent up-tick in home sales with a lot of new residents moving in. Several of the survey participants I spoke with had recently purchased their homes and were in the process of removing “over-grown areas” or installing significant landscaping. Reaching recent arrivals before they “are set” with plantings that may provide minimal habitat value will may be one of those opportune times to engage residents.

²¹ To learn more about the annual Fred Meyer Fuchsia Saturday, visit <http://thecouponproject.com/fred-meyer-free-fuchsia-planting-event-april-12-2014/> or <https://www.facebook.com/fredmeyer/posts/1015138649233207>

and other pollinators. If Backyard Habitat shows how natives can be used in combination with cultivars such as fuchsias, Fred Meyer, which primarily carries non-natives, may see benefit in collaborating. In fact, it may encourage them to begin to carry natives. In this way, leveraging social-capital can have broad benefits.

The study suggested that Backyard Habitat's efforts to collaborate with fellow environmental organizations are strengthening its mission effectiveness. When listing wildlife-friendly gardening resources, a third of participants (9) listed one or more of Audubon and Columbia Land Trust's Intertwine Alliance²² partners. All but one of those participants cited Friends of Trees (FOT) as a resource that they had used, intended to use, and/or would recommend to someone interested in wildlife friendly gardening²³. Many suggested that Backyard Habitat collaborate with FOT in order to increase awareness of their certification program. One participant that had recently used FOT said that selecting street trees listed as beneficial for wildlife played a significant role in his choice. Participants' responses suggest that these organizations can both increase their visibility and better serve residents by publicizing each other's services.

Two other community neighborhood assets that emerged as significant sources of interest to and potential learning resources for participants were the Dharma Rain's planned garden and restoration protect and the Beech Street Community Garden. While I already knew about Dharma Rain's project, I only learned about the nearby Beech Street Community Garden through resident surveys. Participants described them both as potential demonstration gardens as well as sources of local expertise and communities likely to be interested in wildlife friendly gardening. Because several participants described looking forward to "checking out" their plantings that will be open to the public, I included both with other demonstration gardens and self-guided natural areas such as Forest Park²⁴ and the Arboretum.

However, as communities with specific cultural identities, roles in the neighborhood, and goals beyond wildlife-gardening, Dharma Rain and Beech Street Community Garden are more complex than simply a "demonstration garden". While participants primarily spoke positively of the Dharma Rain development²⁵, several residents volunteered that they hadn't participated in their activities since they

²² The Intertwine Alliance is a coalition of more than 100 prominent conservation, public health, outdoor recreation, conservation education, and transportation organizations in the Portland-Vancouver region. They all share missions to preserve open-space and access to natural areas in order to enhance the social and ecological vitality of the region. By working together to create a network of trails and linked natural areas and to pool social, political, and financial capital when advantageous, they seek to have a greater collective impact.

<http://theintertwine.org/about>

²³ Participants also cited by name Friends of the Gorge (1), Metro(1), and Portland Water Bureau (1) as wildlife friendly gardening resources.

²⁴ Of note, the participant who cited Forest Park as a place for inspiration and specific planting combinations did not describe hiking on interpretive trails. Instead she described looking "to nature's design". It is a good example of how not all demonstration gardens need to provide interpretation.

²⁵ Participants expressed relief that Dharma Rain had purchased the property instead of Walmart. However, many expressed concern for the coyotes and other wildlife being displaced by the development. They appreciated that Dharma Rain would preserve and restore some of the property for wildlife and allow access to the public.

were not Buddhists. Similarly, while not spiritually based, the Beech Street Community Garden may attract a sub-section of the neighborhood with a primary interest in growing food that may overlap, but is not necessarily specific to wild-life friendly gardening. Not all people interested in wildlife friendly gardening may be interested in food-gardening and vice-versa. By approaching and working with both communities, Backyard Habitat increases its chances of reaching a broader proportion of the neighborhood and avoiding branding itself as particular to a specific spiritual tradition (Buddhism) or cultural practice (food-gardening). By collaborating with a range of communities within the neighborhood, Backyard Habitat will not only be able to reach a wider audience, but show how wildlife-friendly gardening could be integrated into different practices and serve different goals. Based on the number of participants that cited either Dharma Rain, the community garden, or another demonstration garden, having physical examples appeared to be a desired way of learning what to plant and how. Facilitating places that want to make such gardens publicly available could be a useful way of increasing visibility.

Being Appealing: leveraging drivers

Desire to Connect and Contribute: the importance of agency

Considering that those who described doing something to purposely attract wildlife tended to rate the importance of yard-care for wildlife slightly higher than others (73% vs 61%), interests and belief in agency seem to be correlated with doing the work of “gardening for wildlife”, corroborating earlier research (Clayton, 2007; Goddard, Dougill, & Benton, 2013). This high interest in “seeing wildlife” and belief in yard-care’s importance also appeared to translate into support for Backyard Habitat’s ecological goals. Although I only collected a few follow up surveys (4), 75% who rated high interest in wildlife and belief in yard-care’s importance “very” strongly supported Backyard Habitat’s goals and methods.

High interest in wildlife also correlated with a receptiveness to naturescaped yards with 83% of those who “most” preferred yard-type “A”, compared to 63% of those who “most” preferred type “B” being “very” interested in “seeing wildlife”. Many described naturescaped yards positively because of their benefits for wildlife, saying they looked “butterfly-bee-friendly”. However, one of the strongest predictors of high interest in wildlife and strong belief in yard-care’s importance, was not primary interest in the shown “naturescaped” yards, but preference for the “permaculture” yards (see figure 5). This suggests that some of the participants that may be the most likely to do the work of “gardening for wildlife” were the ones most interested in growing food for themselves. Among these participants who wanted “edibles for everyone”, the desire to care not only for wildlife, but the ecosystem as a whole appeared to be a strong driver of yard-care choices.

In several cases, participant’s interest in the larger ecological community was paired with an interest in building community in the neighborhood. One participant who had recently moved to the

However, some still saw any development of the property as a loss to some of the “wildness” that made their neighborhood a “special” and “secretive” place with abundant wildlife.

area from out of state, described wanting to “learn about the natives to connect to the area” and then added that she thought it would be fun to get some neighbors together to naturescape their yards as a group activity. While this participant appeared outside the norm in her motivation to champion such a communal effort, many residents appeared to identify with the neighborhood’s unique “wildness”, and expressed a strong communal identity.

Similarly, many people’s interest in and desire to care for local wildlife was strengthened by a particular attachment (Clayton, 2007; Goddard, Dougill, & Benton, 2013) to the animals they had encountered, whether it was the humming bird or mallard pair that “returned every year” or the “displaced coyotes.” Their willingness to do work for these animals, whether it was “planting the fuchsias”, “installing a pond”, or “leaving out food” was based on a desire to meet specific animals’ needs and was reinforced by evidence that it worked.

These findings could inform Backyard Habitat’s outreach and on-going communications in several ways. Communicating not just generally, but specifically how the different aspects of naturescaping can aid wildlife and ecological health will enhance participant’s sense of agency (Wertsch, 1997; Flora, Flora, & Fey, 2004). Speaking specifically about the wildlife dynamics in Madison South will speak to the community’s sense of identity. Stories and research supporting the collective impact of naturescaping will be motivating and add legitimacy. Backyard Habitat could appeal to both the place-based sense of community (Gross & Lane, 2007) and personal connection to wildlife in the area to encourage neighborhood appropriate plantings that could collectively have large patch value. To support this effort, Backyard Habitat could look at ways to facilitate communally-minded champions interested in “building community” (Clayton, 2007; Goddard, Dougill, & Benton, 2013).

Shifting social-norms: “wild” increasingly means you care...but please still keep it “orderly”

In keeping with prevailing research (Nassauer, Wang, & Dayrell, 2009), social norms played a role in participants’ yard-preferences. However, their responses suggested that social norms, at least within the neighborhood, may be shifting away from yards dominated by lawns (Nassauer, Wang, & Dayrell, 2009) to yards with more vegetation variation that serve an ecological or practical benefit. This shift seemed tied to attitudes that naturescaped and permaculture yards exhibited a more socially desirable level of “care” (Nassauer, 1988). However, as one participant who liked the naturescaped yards noted, just because one “like[s] it [doesn’t mean one’ll] do it”. It’s a good reminder that barriers can outweigh drivers. Similarly, while there may be a shift towards having an “ecologically friendly yard”, there was still a strong preference for some lawn for functional purposes and a desire for “neatness” (Nassauer, 1988), particularly in the front yard. This suggests that showing how one can create “order” while naturescaping is still important in appealing to many residents.

Perceived as less maintenance: a way to attract birds without pests

Another shifting perception that appears to be making residents more receptive to naturescaping is the belief that it entails less maintenance (watering & mowing). However, several participants who were naturescaping warned that this attitude may set novices up to fail. One such participant urged conservation organizations to remind residents that natives still need care. It

bothered her to see trees planted by FoT and other plantings dying just because “people don’t think they need to water them because their native”. This comment suggests that the perception that naturescaping is less work may be based more on public messaging than direct experience. However, another maintenance-related concern that emerged as a potential driver was that native plants could serve as a way to attract birds without the mess of seeds that also attract pests.

Healthier for them; Healthier for me:

Personal as well as ecological health concerns were a key driver among participants. In general they associated the naturescaped and permaculture yards with “pesticide and herbicide free” care. For some, creating a healthy yard for themselves and their families appeared as pressing, if not more so, as protecting the environment. For many that voiced health related concerns, or described their motives for minimizing pesticides and herbicides, concerns about their own health and that of the “soil, land, and rivers” were interconnected. Allergies emerged as a health-related issue that served as a driver for some yard choices (removing plants) and a barrier for others (doing desired yard-work). Backyard Habitat could explore creating low-allergen yard designs as a driver that could broaden their base.

Sharing Knowledge & Skills: getting specific knowledge when you need it

I have already discussed the importance of sharing information about the benefits of naturescaping to wildlife, and on-going feedback about the impact that locally naturescaped yards are making to residents sense of agency. However, since knowledge is such an important tool informing both what we want to do and what we can do, educational needs further discussion (Flora, Flora, & Fey, 2004; Wertsch, 1997; Goddard, Dougill, & Benton, 2013). The primary appeal for participating in the yard Certification Program was learning specific knowledge and skills. Whether it was “help” creating a design, addressing a particular “problem spot”, identifying unknown plants in the yard, or knowing what will attract what, study participants sought knowledge tailored to their goals. One participant described “accidentally coming across” Audubon’s native plant sale. He was interested in learning more about native landscaping, however he left discouraged because he already had a design in mind, but couldn’t get specific information on grasses and shrubs that would fit the aesthetic he wanted to create.

By continually looking at how they can tailor education to the interests and activities of residents, Backyard Habitat could increase the number of residents who naturescape and who participate in the Certification Program. A time when residents may be most eager for knowledge is when they are establishing a new yard. Backyard Habitat could look for ways to market to recent home-buyers.

Being Feasible: overcoming barriers

Making naturescaping do-able for the non-gardener & busy resident

Obstacles for many participants that desired naturescaped or permaculture yards, but doubted they would do it, related to not being a “gardener” or “yard-person.” While for some this identity (Gross & Lane, 2007) appeared fixed, for others it was more related to the human and material

resources (Flora, Flora, & Fey, 2004) that they could devote at the time. Some participant's lack of interest stemmed from "having a black thumb", while others liked the naturescaped yards but said that they "wouldn't know where to start" or "how to maintain". Some of these same residents had practical concerns about the expense of watering or being "too busy."

Featuring low-maintenance yards (time investment as well as material) on the yard tours could help interested but wary residents consider naturescaping. Backyard Habitat has requirements for naturescaping a certain percentage of one's available greenspace in order to participate in the Certification Program (Audubon Society of Portland, 2013; Columbia Land Trust, 2014). However, if Backyard Habitat wishes to engage some of the non-gardeners or busy residents in order to expand the patch value in a certain area, they could look at designing a targeted program to encourage residents to plant small clumps of specific low-maintenance plants. Such a packaged "bite-sized" communal effort might make naturescaping seem feasible for these non-gardeners and busy residents. Moreover, such an approach may build their confidence and interest in naturescaping, potentially leading them to plant enough of their yard to get it certified.

Accommodating multiple uses & a variety of looks

One way that Backyard Habitat may increase the number of residents that naturescape in the neighborhood is showing them how they can incorporate it into other uses. One of the uses that many residents wanted was food. Providing information about edible native plants with herbal, medicinal, culinary benefits, may encourage a crossover. Similarly showing how groupings of native plants can be used to attract beneficial insects to the garden, or yard practices that enhance habitat while helping maintain the vegetable bed, may enhance interest in naturescaping. Another dimension to making naturescaping feasible is showing residents how they can design the space to resolve conflicting uses, such as scratching chickens, active dogs, and open space for play²⁶. Another way to make naturescaping appealing to a broad base is show how natives and habitat features can be incorporated into a variety of designs ranging from the "wild", "romantic", and "manicured" that appeal to different aesthetics for structure (Van den Berg & Van Winsum-Westra, 2010). Incorporating a "Japanese", "Asian", or "mid-century modern" aesthetic may be particularly relevant given specific mentions of those "looks" as desirable.

Embracing renters as potential participants

Backyard Habitat's website (Audubon Society of Portland, 2013; Columbia Land Trust, 2014) addresses its program to "homeowners." However, based on conversations with staff (West, N., 2014, phone conversation) as well as from my own experience talking to program participants, the program has certified several rental yards. Officially embracing renters as potential participants creates the opportunity for increasing both the number of yards that Backyard Habitat accesses as well as the

²⁶ Having been on a recent yard-tour, I know that Backyard Habitat is already showing designs for multiple-use. One way they could enhance visitor's understanding of the designs is to not only show the finished design, but explain the design process for resolving conflicts.

diversity of the participant base. In the study area comprising of the blocks immediately surrounding Siskiyou Square, 26% of the single family homes on .07 acre or greater lots were rentals. Considering that a disproportionate percentage of Madison South's racial and ethnic minorities rent, embracing renters as potential participants may increase the degree that they feel welcomed by the program. A simple way to "embrace" renters is to remove any exclusive language from affiliated websites (Columbia Land Trust, 2014; Audubon Society of Portland, 2013). Renters may be less likely than homeowners to participate both if they have less freedom to alter the yard and perceive fewer benefits if they are renting short-term; however, those are issues that they can resolve for themselves.

Overcoming language barriers

Because all of Backyard Habitat's literature and outreach is in English, fluency serves as one cultural barrier. In the Madison South, most residents with limited English speak either Spanish or Vietnamese. 2010 census data indicates that more than 12% of residents speak either Spanish or an Asian language, and that approximately half of those residents speak English "less than well". The 2008-2012 American Community Survey indicates that the majority of Asian speakers are Vietnamese and that the majority of them speak limited English (U.S. Census Bureau, 2012). While the census data cannot

accurately show how many residents with limited English are homeowners and, of those homeowners, their primary language, we can infer that language will serve as a barrier to engaging some homeowners as well as a culturally representative portion of the neighborhood. However, looking at the problem from a different angle suggests that if Backyard Habitat can engage fluent bi-lingual residents, then they may be able to bridge to the wider community. English is most limited among older residents, particularly Vietnamese speakers. Youth and middle aged Vietnamese speakers are fluent in English and could serve as bridges.

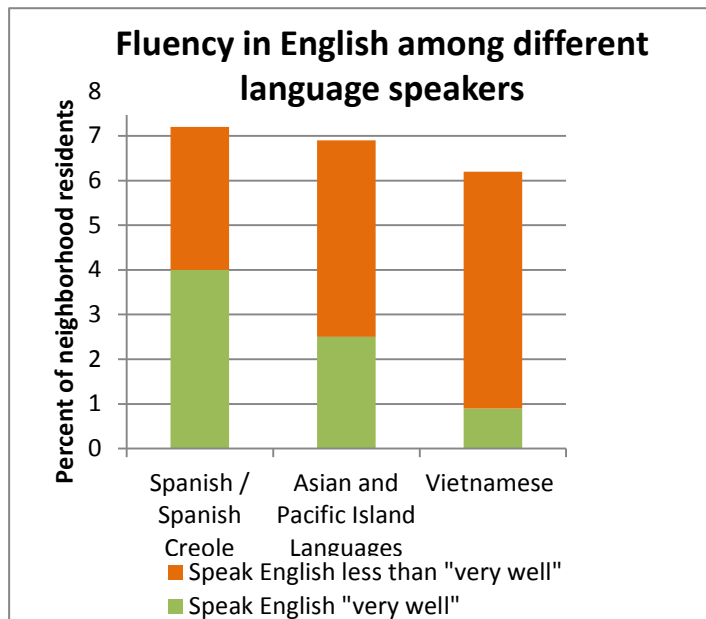
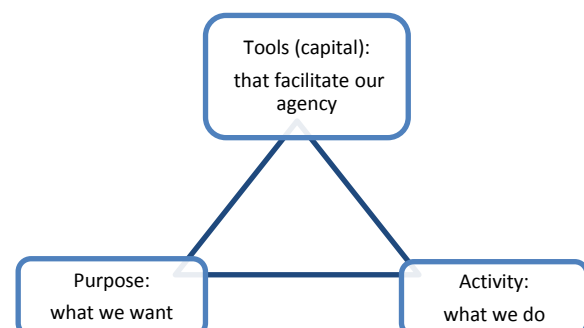


Figure 8 English Fluency among different speakers (U.S. Census Bureau, 2012). "Asian and Pacific Island Languages include Vietnamese speakers."

CHAPTER 4: Summary & Recommendations

Summary:

Urban landscapes are complex social-ecological systems in which the activity of humans



and other living species is informed by each other and their interaction with their environment (Goddard, Dougill, & Benton, 2009; Glaser, 2012; Davidson, 2010). Understanding and affecting the human-nature interaction in urban settings is pressing for conservationists, sociologists, and urban planners concerned with the well-being of both wildlife and humans (Goddard, Dougill, & Benton, 2009; Grimm, Grove, Pickett, & Redman, 2000; Goddard, Dougill, & Benton, 2013).

Backyard Habitat and similar programs that facilitate “gardening for wildlife” have the potential to preserve biodiversity, enhance residents’ satisfaction, and provide important educational experiences that will help us be good stewards in a changing world (Folke, et al., 2002; Goddard, Dougill, & Benton, 2009; Houck & Sallinger, 2013). In order to achieve both their ecological goal of increasing the amount of wildlife habitat on private property, and societal goal of engaging a broad segment of the population, they need to understand the drivers and barriers to participation at both the individual level of the personal experience (Miller & Hobbs, 2002) and the structural level of society (Ribot & Peluso, 2003; Flora, Flora, & Fey, 2004).

This study looked at the Madison South neighborhood in general, and residents surrounding Siskiyou Square specifically as a microcosm for understanding the interplay of different motives and constraints. Below I provide Backyard Habitat specific recommendations about how they could be better known, appealing, and feasible to the residents in Madison South. However, many of the recommendation could be extended to other communities in which Backyard Habitat wants to increase the patch value and size of wildlife habitat, as well as bridging to under-represented populations (Flora, Flora, & Fey, 2004).

The recommendations revolve around the idea that what we do is informed by what we know and the resources, or capital, that we have access to (Flora, Flora, & Fey, 2004; Bourdieu, 1989; Wertsch, 1997; Ribot & Peluso, 2003). Thus Backyard Habitat’s strategies for increasing participation should be based on looking for ways to facilitate desired resident agency.

Limitations of Research

Participants’ preference for “naturescaping”, “permaculture” or food-garden, manicured lawns with ornamentals was based on the photos in the Yard-Type Instrument. The photo sheets did not control many aesthetic and practical variables.

Further Research

Based on the limitations of the research, I recommend further validation of the Yard-Type instrument in order to improve its utility. Do these photos accurately depict what a naturescaped yard in Madison South could look like? How do they compare to what average participants achieve? Are there examples of naturescaped yards not included, that would appeal to a wider demographic?

Recommendations:

Based on survey results and an analysis of neighborhood demographic data, I recommend that Backyard Habitat consider the following strategies in Madison South:

To make good use of this study:

- Use a shortened version of Phase 3's Likert questionnaire to quantify drivers and barriers in Madison South or other neighborhoods in order to inform engagement strategies.
- Tailor advice and knowledge to potential participants needs. Use Phase 3's Likert questionnaire or a modified version during home-visits to catalog participant's interests and concerns.

To be better known:

- Increase the name recognition of the Backyard Habitat Certification Program by prominent use of the Backyard Habitat Program sign whenever possible. For the recent yard-tour of Certified Backyard Habitats run by East Multnomah Soil and Water, the tour website did not feature the Backyard Habitat sign²⁷. Approach EMSWCD about including image of sign and link to program's website on their website. Offer to do the same for EMSWCD's naturescaping courses.
- Approach Madison South Neighborhood Association about distributing an online survey through their *Facebook* page or *Next Door* social media pages to gauge effective outreach strategies in the neighborhood. Survey the level of use of community resources cited by survey participants.
- Approach a range of neighborhood businesses and civic organizations about collaborating either as part of an incentive program, creating a demonstration garden, or community outreach and education. Consider Portland Nursery and the Beech Street Community Garden in addition to Dharma Zen Rain Center as places to start. See Appendix A.
- Collaborate with Friends of Trees about publicizing each other's services.
- Continue the annual yard-tours.



To bridge to under-represented communities:

- Approach community organizations that serve a diverse range or specific under-represented ethnic or cultural groups about creating demonstration gardens or other forms of educational outreach. See appendix .

To be appealing:

- Provide species and community (location) specific knowledge about the benefits of native plants and particular habitat features. Provide on-going feedback about the impact that locally naturescaped yards are making.
- Staff plant sales with knowledgeable volunteers and staff that can answer design questions as well as specific benefits (ecological & human) and needs of plants. Include photos of possible design combinations.
- Expand the variety of plants, particularly grasses, offered through native plant sales.
- Include examples of pairings of beneficial, colorful non-natives with natives as a way of adding more color or visual appeal to the yard.

²⁷ <http://emswcd.org/workshops-and-events/naturescaped-yard-tour/>

- Market to new home-buyers.

To be feasible:

- Create a Facebook Group page that allows Backyard Habitat participants and other interested neighbors to share knowledge, arrange plant exchanges, and inspire one another.

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Appendix: Phase 1, Understanding place & people – Publicly available tools

Tool	Question
MetroMap	What is the census tract for the neighborhood surrounding Siskiyou Square? What are the homes and green space within that census tract? What are the residents surrounding Siskiyou Square? (Q1, phase 1)
American FactFinder 2010 US Census data	What are the percentage of renters and homeowners living in Census tract 29.03 (population 5314)? What are the different reported racial groups living within the census tract? What is the percentage of homeowners compared to renters among the differently identified racial groups? (Q1, phase 1)
PortlandMaps	What Properties within the study area are owner-occupied? (in order to select participant pool) (Q1, phase 1)
Intertwine Alliance's Regional Conservation Strategy online habitat value assessment tool	Where is the ecologically valuable green-space? (Q1, phase 1)
Google Maps, Madison South Neighborhood Association Website, Yellow Pages, & other on-line resources	What are the community organizations (non-profit, religious, educational, civic, commercial, and recreational) that serve Madison South that could collectively serve as a bridge to a broadly representative demographic? What are the media channels and other resources in the neighborhood that Backyard Habitat could leverage to connect with a broad audience? (Q3 phase 1 and 3)

Appendix: Phase 1, Understanding place & people –Ecological Value of Green-Space & Social Boundaries of Madison South Neighborhood

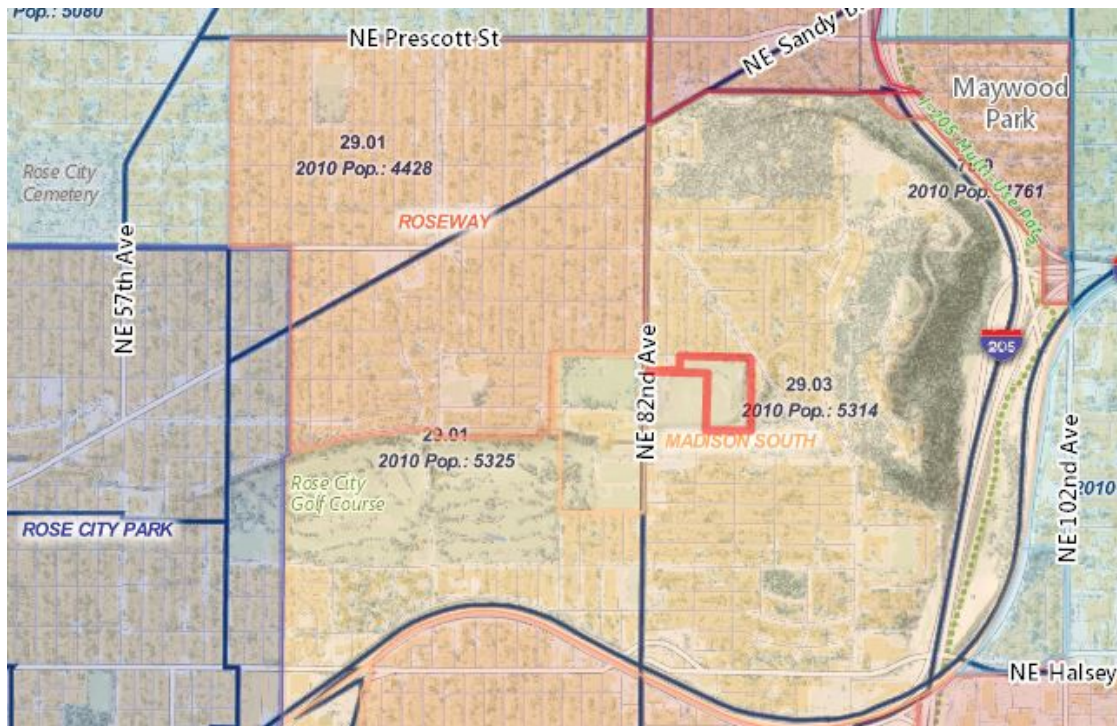


Figure 9 Neighborhood boundaries for Madison South (yellow) and Census tract boundaries (blue). Dharma Rain Zen Center's recently purchased property (red) is in census tract 29.03. (Metro Data Resource Center, 2014)



Figure 10 Green-space in Madison South Neighborhood (red boundary) using Intertwine Alliance RCS-local filter: Image shows how Siskiyou Square (yellow) serves as key connectivity for Rocky Butte Habitat Area and Rose City Golf Course Habitat (Gyokuko, 2014)

Appendix: Phase 1, Understanding the place & people – Study area's percentage of owner-occupied residents by block

Figure 13 Percentage of owner-occupied homes by block:

Based on data from Portland Maps, the rate of home ownership among the residents is 65% (City of Portland, 2014). All of block #14's residents, and 65% of block#12 's residents are part of a HOA managed Madison Park. All but one of the townhomes in the duplex were rented. The limited green-space's landscaping was strictly controlled by the HOA creating a unified look. If we exclude this rental-plex, then the rate of owner-occupied homes in the study area is 73.5%. In other words 26.5% of the single family residents with yards within the study area were rented.

(note: the RCS filter used in this graphic was not available on-line later in the study.)



Block	# homes	#owner occupied	owner occupied
1	12	7	58%
2	24	18	75%
3	34	28	82%
4	20	13	65%
5	6	5	83%
6	22	18	82%
7	17	14	82%
8	37	30	81%
9	12	7	58%
10	17	15	88%
11	31	19	61%
12	23	4	17%
13	15	12	80%
14	20	1	5%
15	19	10	53%
16	0	0	0%
17	9	7	78%

Appendix: Community Resources - Mapped

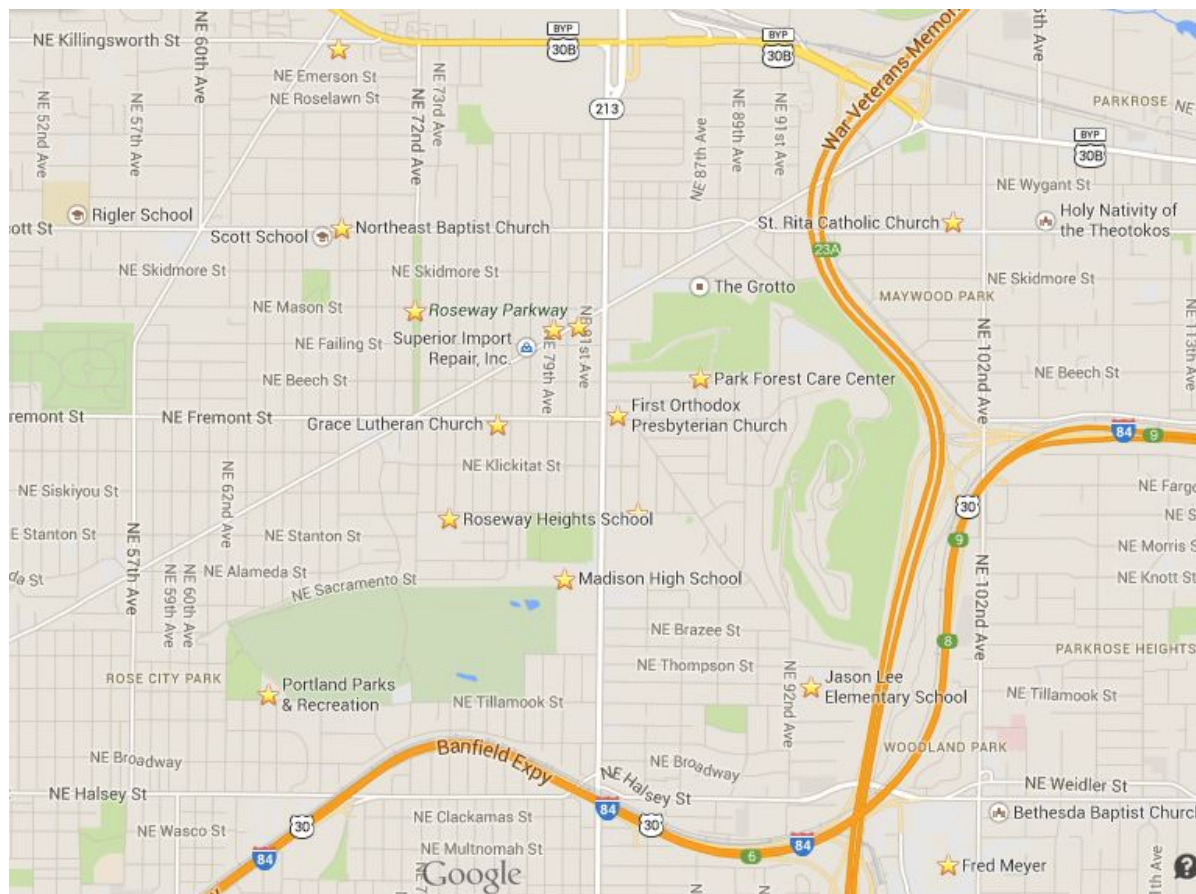


Figure 14 Location of Community Resources (some resources fall outside of area shown)

- Resource cited by survey participant
- Community organization that could serve as bridge to under-represented racial & ethnic groups

Community Garden & Their Partners:

- Beech Street Community Garden (Urban Farm Collective)
8643 NE Beech St
E: urbanfarmcollective@gmail.com
W: <http://urbanfarmcollective.com/ufc-gardens/ne-collective/beece-st/>
S: https://www.facebook.com/beecestreetgarden?hc_location=timeline

Park Forest Care Center

8643 NE Beech St

Portland, OR 97220

prestigecare.com

Key business donor for Beech Street Community Garden. Have the adjacent property.

Schools:

-serve diverse cross-section of community. See enrollment statistics for diversity of student body

- Madison South High school:
● 2735 NE 82nd Ave
Portland, OR 97220
[http://www.pps.k12.or.us/schools/madison/Enrollment statistics](http://www.pps.k12.or.us/schools/madison/Enrollment%20statistics)
Have a native garden already.
- Jason Lee Elementary School
● 2222 NE 92nd Ave
Portland, OR 97220
[http://www.pps.k12.or.us/schools/lee/Enrollment statistics](http://www.pps.k12.or.us/schools/lee/Enrollment%20statistics)
- Roseway Heights School
● 7334 NE Siskiyou St
Portland, OR 97213
[http://www.pps.k12.or.us/schools/rosewayheights/Enrollment Statistics](http://www.pps.k12.or.us/schools/rosewayheights/Enrollment%20Statistics)

Community Centers & Civic Organizations:

- Madison South Neighborhood Association:
Website: <http://www.madisonsouth.org/>
FaceBook: <https://www.facebook.com/groups/125027987552528/>
Nextdoor: <https://madisonsouth.nextdoor.com/login/>
- Multnomah County Library (Gregory Heights):
● 7921 NE Sandy Boulevard
Portland, OR 97213
(503) 988-5386
<https://multcolib.org/library-location/gregory-heights>
Provides some translation services as well as offering community meeting space.
- Portland International Business District
(503) 249-3926
*Hosts annual **Multi-cultural Festival**, noon to 6 p.m. July 10 on the Northeast 72nd Avenue Park Blocks immediately north of Fremont Street. Table space for businesses and public agencies.*
- IRCO Asian Family Center
8040 Northeast Sandy Boulevard
Portland
(503) 235-9396
<http://www.irco.org/who-we-are/our-unique-locations/asian-family-center/>

- Baltazar F Ortiz Community Center
6736 NE Killingsworth St
Portland, OR 97218-3317
<http://www3.multco.us/countyproperties/BuildingGeneralInformation.aspx?bldgnbr=338>

● **Spiritually Based Community Organizations:**

Potentially a resource for reaching civically minded members of different cultural groups. I did not conduct a survey to gauge the diversity of the each congregation. Instead I sought to include at least one place of worship of each sect that I could identify near or within the Madison South neighborhood.

- Dharma Rain Zen Center
Siskiyou Square Development
8400 NE Siskiyou St
Portland, OR 97220

Catholic Charities
El Programa Hispano
2740 SE Powell Blvd.
http://www.catholiccharitiesoregon.org/services_latino_services.asp
Serves Latino and other Spanish speaking families.

First Orthodox Presbyterian Church
8245 NE Fremont St
Portland, OR 97220
<http://www.firstopcportland.org/>

Grace Lutheran Church
7610 NE Fremont St
Portland, OR 97213
<http://www.grace-wels.net/>

Northeast Baptist Church
6701 NE Prescott St
Portland, OR 97218
<http://nepdx.org/eindex.html>

● **Community Newspapers:**

Asian Reporter
922 N. Killingsworth St., Suite 1A,
Portland, OR 97217
<http://www.asianreporter.com/>

Hollywood Star News
<http://star-news.info/2010/06/11/multi-cultural-festival-needs-you/>
Community Newspaper serving North and Northeast Portland neighborhoods that publishes an on-line version and includes a Facebook page

Nurseries:

- Portland Nursery
9000 SE Division St
Portland, OR 97266
and
5050 SE Stark St
Portland, OR 97215
<http://portlandnursery.com/>
Offers classes and design advice as well as some native plants
- Dennis' 7 Dees
6025 SE Powell Blvd
Portland, OR 97206
<http://www.dennis7dees.com/>
Offers design advice as well as plants and landscaping material
- Backyard Bird Shop
1419 NE Fremont St
Portland, OR 97212
<http://www.backyardbirdshop.com/>
- Fred Meyer - Gateway
1111 NE 102nd Ave
Portland, OR 97220
Every April the Gateway and other local Fred Meyers sponsors a Fuchsia Event; when customers buy a plant, they can get free soil to fill a planter.
- The Home Depot - NE Portland
NE Glen Widing Dr
Portland, OR 97220
- Garden Fever
3433 NE 24th Ave
Portland, OR 97212
<http://www.gardenfever.com>

Appendix: Community Resources – Itemized survey responses

	Backyard Habitat affiliated organizations and services	Other Intertwine Alliance Partners	Nurseries & Landscaping related businesses	Demonstration Gardens & Natural Areas	Self-Directed Learning Sources	Peers & Local Knowledge	Other community organizations or Events
Resource (number of survey participants who cited)	Audubon (9)	Friends of Trees (8)	Portland Nursery (10)	DRZC (5)	Internet/Google(13)	Friend or neighbor expert (7)	OSU Master Gardeners (3)
	Leach Botanical Garden (1)	Friends of the Gorge (1)	7 Dees (4)	Beech Community Garden (4)	Library or bookstore (4)	Local pro: landscapers or arborists (2)	Schools or PTA (3)
	“signs” (3)	Portland Water Bureau (1)	Backyard Bird Shop (3)	Arboretum (1)			Garden/Sustainability show (2)
	Plant sale (2)	Metro (1)	Fred Meyers (2)	Forest Park (1)			Farmers’ Market (1)
	Yard-tour (1)		Home Depot (2)				
	Visit Audubon website (1)		Garden Fever (1)				
			Nurseries in general – didn’t specify one by name (7)				

Appendix: Survey Instrument – Yard Photos

Residential survey of home-owner's attitudes and perceptions about their yards and neighborhood green-space: Yard type instrument

----- Sample photos A-----

Figure 15



Figure 16 http://emswcd.org/wp-content/uploads/2013/07/inyouryard_sidebar_yt1.jpg



Figure 17
<http://www.heritageseedlings.com/shop/wpimages/native-landscaping-2005-04-11-01-e-bs-back-yard.jp>



Figure 18 <http://emswcd.org/wp-content/uploads/2013/07/inyouryard.jpg>



Residential survey of home-owner's attitudes and perceptions about their yards and neighborhood green-space: Yard-type instrument
----- Sample photos B-----

Figure 19



Figure 20 <http://tallahasseelawnservices.com/wp-content/uploads/Tallahassee-lawns-yard-care-lawn-services-e1365883201680.jpg>



Figure 21 <http://www.lifeinitaly.com/img/lawns-gardens-1.jpg>



Figure 22



Residential survey of home-owner's attitudes and perceptions about their yards and neighborhood green-space: Yard-type instrument
----- Sample photos C-----

Figure 23

<https://bbbseed2.worldsecursystems.com/blog%20images/front%20yard%20garden2.jpg>



Figure 24

<https://greshamoregon.gov/uploadedImages/Internet/City/Sustainability/raisedGardenBeds.jpg>



Figure 11 <http://amazinghomedesignideas.net/wp-content/uploads/2013/06/Front-yard-vegetable-garden-design-141.jpg>



Figure 25

<http://jellypress.pmhclients.com/images/uploads/garden2.jpg>



Appendix: Phase 2 Survey Instrument- Protocol with corrections

Introductory Script:

My name is _____. I am a graduate student at Oregon State University. For my final research project I would like to better understand what residents in the Madison South Neighborhood want from their yard and neighborhood greenspace. Could I speak to someone who lives here who is 18 or older? (If “yes”) Would you be willing to answer 9 questions? It will take approximately 10 minutes. (If language-differences prove too much of a difficulty, kindly thank resident and end.)

(If answer ‘yes’) Throughout this interview, please talk freely and honestly. I am not looking for a “right” answer. What’s important to me is learning what you think and care about. Participation is voluntary. You can skip questions or stop answering questions at any time. If you decide to skip questions or stop answering questions, I will use the answers that you’ve already given unless you ask me to do otherwise. (Give participant hand-out with PI and IRB contact information)

If you have any questions or concerns about the study, you can reach me, _____ at _____ or my OSU academic advisor, _____ at _____.

If you have questions about your rights as a participant in this study, contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator at (541) 737-4933 or IRB@oregonstate.edu.

Thanks again.

Survey Questions:

Survey& Interview code: Response#/Block #
--

Uses:

- 1. What are the different ways that people and animals currently use your yard?***

Values:

Show participant 3 sheets of examples of yards that are 1) naturescaped, 2) predominantly non-native ornamentals with manicured lawns, and 3) vegetable gardens.

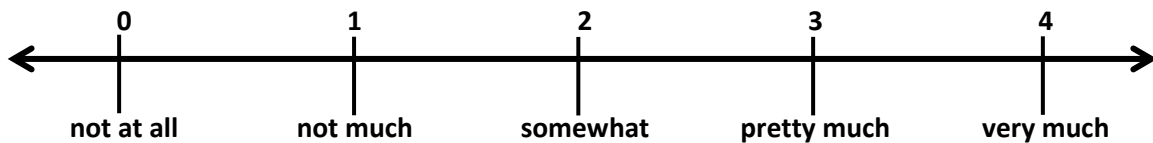
These three sheets show three types of yards

- 2. Which type would you most want your current yard to be like?***

3. *Is there a combination of these yard types that best represents what you would like your yard to be like?*
4. *Is there a type or look not shown that you would like better?*
5. *What do you like about this (these) type(s) of yards that you pointed to (or described)?*

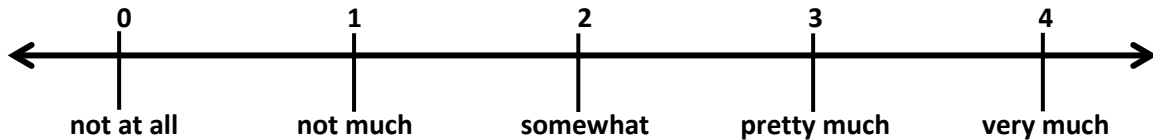
Values Cont:

6. *To what degree do you like seeing birds, butterflies, or wildlife in your yard or neighborhood?*



Perceptions:

7. *How much do you think the way we landscape and maintain our yards affects the presence of birds, butterflies, or wildlife?*



8. *If someone in your neighborhood was interested in attracting birds, butterflies, or wildlife, what organizations, places, or resources could they go to or use to learn more?*
9. *If they expressed interest in Question #6 (a 2 or higher) **Have done any of what you just described?***

Many environmental educational organizations that want to work with residents to provide habitat for wildlife, such as birds, in our neighborhoods, want to reach more people than they currently are. One of the goals of my study is to help environmental education organizations such as Backyard Habitat understand resident's interests and how they could be better served. The following questions are to learn a little more about you? Please only answer what you want to.

Demographic Data:

1. *What languages do you prefer to speak at home?*
2. *How do you identify ethnically?*
3. *How long do you expect that you will live in your current home?*

Less than 1 year	Less than 3 years	Less than 7 years	7 years or more	Don't know
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4. Is there anything else that Backyard Habitat and similar organizations should know about your interests or concerns, *or the issues specific to this neighborhood in order to be more effective at serving residents who might be interested in wild-life friendly gardening?*²⁸

Thank you. Those are all my questions. People can have many different goals or uses for their yards. Sometimes these goals overlap with what the Backyard Habitat and similar organizations are trying to do. From these surveys, I would like to interview several residents more in depth about their interests and the ways they care for their yards. Could I add you to the list of people that I will possibly call in several weeks? That interview will take approximately 10-15 minutes and you can decline at anytime. (If “yes,”) Could you give me a phone number and time when I could contact you ([see attached roster](#)). If you have any questions or concerns about the study, you can reach me or my advisor at the numbers on the sheet I gave you. Thank you very much

²⁸²⁸ Added later since many people were volunteering information about the neighborhood – not just specific to their yards or personal interests.

Appendix: Phase 3 Follow-up Interview & Likert –Scale survey

Introductory Script:

My name is Jinnet Powel. May I speak to _____. I am the graduate student at Oregon State University, who talked to you earlier about your yard. Based on the responses I got from the neighborhood I have some follow up questions about how people maintain their yards and what motivates them to landscape the way they do. Would you be willing to answer some of these questions for my research project? It will take approximately 10 minutes and you can stop at anytime.

(If answer 'yes') Throughout this interview, please talk freely and honestly. I am not looking for a "right" answer. What's important is what you think and care about. Participation is voluntary. You can skip questions or stop answering at any time. If you decide to skip questions or stop answering, I will use the answers you've already given unless you ask me to do otherwise. Do you still have the contact information I gave you during the survey? If not, I can give you that information again if you have any questions about the study at a later time.

If you have any questions or concerns about the study, you can reach me, Jinnet Powel at 503-936 0560 or my OSU academic advisor, Dr. Jennifer Bachman at 541-737-1819.

If you have questions about your rights as a participant in this study, contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator at (541) 737-4933 or IRB@oregonstate.edu

Do you agree to participate?

Survey& Interview code: Response#/Block #
--

Yard Activity:

- 1) ***What are the things that you or someone else does to take care of your yard? (based on the survey responses, this question was redundant and should be eliminated)***

Now I'd like to talk about motives. I'd like to learn what benefits you **would like** from your yard. (Later I will ask whether or not you are able to get them from your current yard and why.) But first, I am going to read you a list of different **motives** that people may have for landscaping and caring for their yards the way that they do. Please answer on a scale of 0-4, whether you would like to do the following with your yard. 0 = strongly disagree 1= disagree, 2 = agree 3 = strongly agree

- 2) ***Likert scale instrument (see attached Likert Instrument)***

You just described the following things as important to you: (list items marked as a 3)

- 3) ***Are you currently able to get all of these benefits from your yard?***
- 4) ***What, if anything is getting in the way of making your yard the way you want?***
- 5) ***Here is a list of common barriers or reasons that may get in the way of people making their yards the way they want. To what degree are the following true for you at this time***

I am now going to describe a program. First, I'd like to know to what degree you share their goals and, second, to what degree you would want to participate in it or a similar program. I am not affiliated with this program or any similar one. So please answer freely. I'd like to learn the degree to which it would benefit you:

The Backyard Habitat Certification Program is a program that works with homeowners to conserve land and wildlife by removing aggressive weeds, creating wildlife habitat and gardening responsibly. A trained technician would come to your home and help you identify invasive or aggressive weeds that should be removed, come up with a planting plan for what native plants would do well in your yard, and identify other ways that you could reduce the need for chemicals, watering, and mowing. Based on this site visit, the technician puts together a report outlining the steps that you discussed. This site visit costs \$25. You'll receive [discounts and incentives](#) for native plants and other materials to help you on your way. A monthly e-newsletter will keep you informed of local events, workshops, plant sales and other great resources. When your yard is certified wildlife friendly, you will receive a Certified Backyard Habitat sign that you can display. It generally takes homeowners 3 months to 1 year to get certified.

- 6) **Based on what I just described, to what degree are you likely to support the goal of conserving land and wildlife by removing aggressive weeds, creating wildlife habitat and gardening responsibly in your yard by doing the work on your own (ie not part of a program)?**
- 7) **Based on what I just described, how interested would you be in participating in the program?**
- 8) **Would you briefly explain why?**

Those are all the questions. Do you have any questions now that I could answer? Thank you very much for your time!

Resident Interview Questions:**9) What are the things that you or someone else does to take care of your yard?****10) To what degree would you like the following to be true in your current yard?***(0 not at all, 1 more not than true, 2 more true than not, 3 very much so)***(Likert scale of yard-design/care drivers)**

	0	1	2	3
Observe birds, wildlife and other parts of nature; Attracting wildlife.				
Keep neighborhood animals out of my yard: cats, dogs				
Keep certain wildlife out of my yard: rats, raccoons, squirrels, coyotes* part of the package				
Have an open place for kids or others to run, play sports or be active				
Have privacy from neighboring yards or street				
Have a patio or other hardscape area to be outside without being on lawn or damp ground				
Have covered area to be outside but out of rain or hot-sun				
Have a place to let/keep dog outside				
Have a place to let/keep cat outside				
Have space for other animals such as chickens				
Have open space to entertain, have people over				
Compost on-site				
Have showy, colorful flowers				
Grow plants for food, veggies/fruits				
Grow plants such as herbs for flavor or medicine				
Have the yard or part of it look neat and orderly				
Have the yard or part of it look wild, or mimic nature				
Have plantings with year-round interest				
Have shade; lots of trees				
Have sun; few trees				
Have a yard that is lush, lots of green, healthy plants				
Have a yard that is sparse, not overwhelming				
Have a yard that is well structured – “modern” looking				
Have a lush, green lawn.				
Have a yard that is chemical free (herbicides and pesticides)				
Have a yard that looks good in the neighborhood; Keeping the neighborhood looking good.				
Having a yard that others will like in case you sell; maintaining the value of your property				
Keep surrounding rivers, soil, and land healthy and plentiful for wildlife and people: maintaining your yard in a way that contributes to the health of the ecosystem				
Connect to the place you live: learning about what grows and lives locally				
Feel connected to cultural traditions: learning about traditional foods, technology, medicines				
Grow plants for crafts or arts (weaving, dyeing)				

Garden or landscaping as way to be creative				
Have a place kids can interact with nature and learn				
Have a yard that is easy to take care of : “takes care of itself”				
Have a yard that requires little watering				
Have a yard that requires little mowing				
Have a yard that requires little weeding				

Are there any other motives you have that affect how you landscape and care for your yard?

You just described the following things as important to you: (list items marked as a 4)

11) Are you currently able to get all of these benefits from your yard?

12) What, if anything is getting in the way of making your yard the way you want?

13) Here is a list of common barriers or reasons that may get in the way of people making their yards the way they want. To what degree are the following true for you at this time

0 = strongly disagree 1= disagree, 2 = agree 3 = strongly agree

	0	1	2	3
There are no barriers; my yard is just the way I want it				
Life- My yard's not important right now. Putting in the effort doesn't make sense right now (moving)				
Space - The space won't work for what I want				
Time- Don't have time for it now.				
Money- Don't want to spend the money on it now				
Knowledge - Don't know how to get it to look the way I want				
Effort- Too much work. Don't want to or can't do the work.				
Skill- Don't have the skills; have a “black thumb”				
Interest - This kind of thing doesn't interest m				
Other that mentioned above: allergies				

14) How likely are you to remove aggressive weeds, create wildlife habitat and garden responsibly in your yard in order to support the goal of conserving land and wildlife. You share the same goal *0 = strongly disagree, 1= disagree, 2 = agree, 3 =strongly agree,*

15) Based on what I just described, how interested are you in participating in this program? You see a benefit from participating in the program *0 =strongly disagree , 1= disagree, 2 = agree, 3 =strongly agree*

16) Would you briefly explain why?