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Using Brownfields to Think Green: Investigating Factors that Influence Community Decision-Making and Participation

Charissa Ruth Stair
Portland State University

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Using Brownfields to Think Green: Investigating Factors that Influence Community
Decision-Making and Participation

by
Charissa Ruth Stair

A thesis submitted in partial fulfillment of the
requirements for the degree of

Master of Science in Teaching
in
General Science

Thesis Committee:
William Becker, Chair
Sybil Kelley
Cary Sneider

Portland State University
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Abstract

Brownfield restoration and remediation is a growing concern across the United States. Brownfields are vacant or abandoned properties with real or perceived contamination. Successfully restoring these properties requires strong stakeholder collaboration, including the local community. The purpose of this study was to explore the complexities of creating a community garden on a residential brownfield site located in a low-income, high-minority neighborhood and to gain a better understanding of how a community based project develops and impacts individuals from the community. Specifically, the study investigated who chose to participate in the project, what motivated individuals to become involved and remain committed, and how individual's understanding of the project's risks and plans changed throughout his/her involvement. The case study followed 17 participants through the first year of the Emerson Street Garden, a brownfield restoration project in the King Neighborhood of northeast Portland, Oregon. Findings showed that individuals were attracted to different styles of outreach materials based on their own personality and preferences. The desire to improve the community was an important motivation for all the participants but personal motivation was not connected to knowledge retention. While the Emerson Working Group was successful at distributing knowledge to all its members, individual's flexibility to new ideas was critical for continued involvement in the working group. In conclusion, the study found that a "one-size-fits-all" method for engaging community members in urban restoration and renewal projects does not exist; however, there are best practices that can be applied to most situations. Implications for practice and further research are discussed.

Dedication

To Sybil, your passion for the Emerson Garden has been a driving force throughout this project and our chats have kept me sane.

To Jefferson, your enthusiasm for the Emerson Garden knew no bounds and your energy and effort shaped what it is today. You will be missed.

Acknowledgments

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Chapter 1: Introduction

Restoration is impossible to separate from culture. It is defined as a cultural act by its very interaction between humanity, the dominant animal in urban ecosystems, and nature (Edgar, 2007). For urban ecosystems, a growing number of restoration efforts center around brownfields. Brownfields are properties that are vacant or have been abandoned because of real or perceived contamination (EPA, 2009). These degraded properties are economic, social, and environmental concerns (Ellerbusch, 2006). Previous research has shown that public participation can have a significant influence on the success of urban restoration efforts, but that shared vision and a concrete understanding of the problem and potential risks are essential in order to meet all the concerns brownfields pose (Solitare, 2008).

Community gardens have been presented as a solution to creating a shared vision and bridging the preference gap between the desire of residents for parks and community amenities, and the prevalent economic agenda of municipalities that focus on commercial and industrial re-use opportunities (DeSousa, 2006; Greenberg and Lewis, 2000). Krasny and Tidball (2009) urge that environmental education programs like community gardening can be a key piece to building a resilient ecosystem. Educational outreach is considered an essential part of restoration efforts, but in their review of the Technical Outreach Services to Communities Programme of the EPA, Ellerbusch, Gute, Desmarais, and Woodin (2006) concluded that access to technical resources has been a barrier for some communities involved in brownfield projects. It is not well understood what types of educational programs actually contribute to a sustainable change in understanding that leads to informed decision-making and behavioral change. Often the methods used fall

short of achieving a sustainable change in participants' thinking and behavior (Tilbury and Wortman, 2008).

Environmental education programs rely on a variety of educational outreach components to distribute information. Print media like flyers, signs, and newspapers, as well as community meetings, clubs and other outreach activities fall into a category of education called free-choice learning. It has been estimated that as much as half of the public's understanding of science comes from free-choice learning programs (J. Falk, 2002). By the very nature of their settings, the learning outcomes of free-choice learning programs must be considered within a web of dynamic social factors. The reality is that the complex changes in understanding that lead to changes in behavior and attitudes can take large spans of time and a multitude of experiences (Storksdieck, Ellenbogen, and Heimlich, 2005).

When examining past brownfield projects, a number of informational/educational issues have been considered. Lack of access to information hampers meaningful participation, but informational resources can be difficult to gather and distribute (Thomas, 2003). The complexity of the information deficit is compounded by the reality that low-income and minority communities host a majority of brownfield locations (Gallagher and Jackson, 2008; Herbele and Wernstadt, 2006). Distributing technical information to these communities can be especially complicated because of language and cultural barriers (Greenberg and Lewis, 2000; Tilbury and Wortman, 2008) and because community members often do not have a lot of extra time to invest in the project (Solitare, 2008). The EPA addressed some of these concerns through their Technical Assistance to Brownfield Communities Program (TAB) and the Technical Outreach

Services to Communities Program (TOSC), funded by the Hazardous Substances Research Centers (Thomas, 2003). These regulations, however, are only applied to EPA projects (Solitare, 2008). With a growing number of private brownfield remediation projects, there is a real need for methods of introducing localized community education to reduce delays and improve community capacity for sustainable environmental problem-solving. Brownfield technical information must be tailored to the highly specific characteristics of the site, which can include political processes involved, property history, previous actions, links to other sites, costs, resources, and specifics of the contamination (Thomas, 2003). In order to make informed decisions, participants need to be able to answer questions such as (but not limited to):

- What are the environmental conditions on the site?
- What are the remediation options for the site?
- What are the relative risks to local residents if there is no remediation?
- What are the relative risks to local residents while the project is occurring?
- What are the risks to local residents from operation of the remediated site?

(Questions adapted from Thomas, 2003)

Emerson Street Garden Project: Problem and Purpose

In order to explore the challenges of disseminating critical information necessary for informed decision-making in a free-choice learning environment, this study followed several community members participating in activities conducted as part of a community garden project planned at a residential brownfield site. The Emerson Street Garden, which began over 16 years ago during a movement to create green spaces and “pocket parks” in urban neighborhoods, was proposed to create a garden for youth on a vacant lot

located in the 800 block of NE Emerson Street in the King Neighborhood of Portland, Oregon.

The Emerson Street Garden is unique because it is a residential property. Most identified brownfields have been in industrial areas. Over 5 million acres of industrial property in urban areas in the United States have been qualified as brownfields (HUD, 2009). Residential properties are not often identified as brownfields because soil testing is not required during transfers of ownership. During the process of implementing the Emerson Street Garden its leaders had to navigate several bureaucratic hurdles, not the least of which was the discovery of elevated lead levels, which led to the site being identified as a brownfield. The current lead levels at the site range from 16 parts per million (ppm) to nearly 670 ppm. The Department of Environmental Quality (2011) has set the maximum allowable limit for lead in residential soils at 400 ppm and the average, naturally-occurring background level for lead in Oregon soils is 17ppm. Due to these standards and concerns, the project partners have set a goal to reduce the lead levels to 50 ppm or below where food will be grown. The Oregon Sustainable Agricultural Land Trust (OSALT) manages the project in partnership with Groundwork Portland and with funding, in part, from the Portland Brownfield Program and the East Multnomah Soil and Water Conservation District. The Department of Environmental Quality (DEQ) approved an experimental remediation plan to move the contaminated soil to a contained area on the property where a phytoremediation test garden would be established with ongoing monitoring. Meanwhile, the leaders of the Emerson Street Garden Project would organize the local community to plan, develop, and use the remainder of the site as a garden and greenspace.

The residential character of the Emerson Street Garden also has implications for its sustainability and community involvement. The Emerson Street Garden is located in the King Neighborhood of NE Portland and is one of 13 neighborhoods that make up the Albina community. Albina's history has been dominated by the exploitation of economic opportunities and the rise and fall of various transportation projects through which improvements for the good of the city resulted in economic losses and housing displacement for many of the low income populations in the community. Due to the difficult history of the neighborhood, an understanding of previous activities is necessary to understand current attitudes toward redevelopment projects and the resulting impact on community involvement.

King Neighborhood was formerly located near streetcar lines and had a diverse demographic profile including a large Russian-German community and many working class Irish, German, and Scandinavian immigrants. Albina has also historically been home to the majority of Portland's African American population, many of whom came to Portland to work in the shipyards and lived in Vanport prior to the historic flood in 1948 (Dixon et al., 1990). Urban renewal projects swept through the Albina area in the 1960's and 70's, leaving behind a legacy of hurt and distrust. "Clearance of blighted areas often resulted in destroying down at the heels but still viable neighborhood areas and displacing its residents with large scale developers and institutional uses as the primary beneficiaries" (Dixon et al., p. 49). One such project that directly impacted the residents living near 822 NE Emerson Street was the Union Avenue Redevelopment Plan. The goals of the project were to "create new economic opportunities for local businesses, enhance the physical appearance of the street and provide housing opportunities in the

surrounding neighborhoods” (Dixon et al., p. 53). As part of the project a median was erected down the center of Union Avenue in order to reduce accident rates and improve the flow of traffic. The median did fix the targeted problems, but it also eliminated the majority of on-street parking, reducing accessibility to local businesses. “The construction of the median strip is perceived by many in the Albina community as one of the factors hindering revitalization of Union Avenue’s business district and the surrounding area” (Dixon et al., p. 53). Because of this history of economic development in the Albina Community, organizers of new property redevelopment projects must acknowledge the damage done from previous projects as a first step in actively engaging the local community in meaningful, productive ways.

Information necessary to engage community members and answer their questions about brownfields and the Emerson site was distributed using several educational tools including flyers, brochures, and presentations during two design charrettes. In addition to educating attendees, the charrettes also provided a venue for community members to be directly involved in designing the garden. Research has shown it is important that community members be able to make sound decisions based on a good understanding of risks and opportunities so that they don’t feel they are simply rubber-stamping pre-made plans (Solitare, 2008). The impact of the educational tools was examined through observations, surveys, and several interviews. Feedback from the surveys and interviews was also used to compare the experiences of the participants to research in other free-choice learning environments, which has shown personal motivation and agenda to be important independent factors in retention of knowledge and involvement.

Tilbury and Wortman (2009) suggest environmental education programs that lead to sustainable practice succeed because they guide the community to develop visioning, critical thinking, democratic engagement and action taking skills. For this to occur in a free-choice learning environment it is important to identify what motivates the population, and observe if conflicting values are acknowledged and accepted to create a stronger community or allowed to fester unaddressed. The Emerson Street Garden brownfield restoration project has provided an opportunity to explore these facets of sustainable practice through hands-on decision-making opportunities along with educational components that aim both to inform and motivate participants by personalizing concerns. This study explored the complexities of creating a community garden on a residential brownfield in a low-income community with a large minority population in order to better understand how a community based project like Emerson unfolds and how the participants are impacted.

Chapter 2: Review of Literature

This exploratory study of the development and sustainability of the Emerson Street Garden Project connects to a diverse set of literature. To gain a better understanding of the research that impacts this study, literature was reviewed in four areas: the current state and characteristics of brownfields, key issues regarding public participation, the role and challenges of technical information dissemination, and factors that influence free-choice learning. Table 1 outlines the progression of the review and key papers for each area. Some papers fall into multiple categories, and will be found in the review area where they are most relevant.

Table 1:

Outline of Key Ideas and Relevant Literature. The bold text indicates reviewed articles.

Brownfields

Prevalence in Low SES
Communities

Ellerbusch, 2006
Gallager and Jackson, 2008
Herbele and Wernstadt, 2006
Solitare, 2008
Zarcadoolas et al., 2001

Economic, Social, and
Environmental Risks

Ellerbusch, 2006
EPA, 1997
Herbele and Wernstadt, 2006
Solitare, 2008

Public Participation

Environmental Justice

DePass, 2006
Ellerbusch, 2006
Gallager and Jackson, 2008
Shulman et al., 2005
Thomas, 2003

Meaningful Participation

Ellerbusch et al., 2006
Gallager and Jackson, 2008
Greenberg and Lewis, 2006
Gute, 2006
Solitare, 2008

Preference Gap (Commercial vs.
Communal)

De Sousa, 2006
EPA, 2009
Holland, 2004

<u>Technical Information Needs</u>	
Importance for Sustainable Decision-Making	Ellerbusch et al., 2006 Thomas, 2003 Solitare, 2008 Zarcadoolas et al., 2001
Review of Current Educational Programs	Gute and Taylor, 2006 Tilbury and Wortman, 2008
Inclusion of Local Language and Cultural Factors	Tilbury and Wortman, 2008 Zarcadoolas et al., 2001
<u>Free Choice Learning</u>	
Individual Motivation and Agenda	J. Falk, 2002 J. Falk, Moussouri, and Coulson, 1998 Storksdieck, Ellenbogen and Heimlich, 2005
Learning in Community	I. Falk, 1997

Brownfields

The remediation of brownfields is a subject of interest across the United States (US) and at all levels of government (DePass, 2006). The US Environmental Protection Agency (EPA) initially defined brownfields as ‘abandoned, idled, or under-used industrial or commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination (EPA, 1997). This definition encompassed anywhere from 500,000 to 1 million sites across the US (Ellerbusch 2006; Solitare, 2005). In 2002, Congress further expanded that definition in the Small Business Liability Relief and Brownfields Revitalization Act, (SBLRBRA) to cover any property “which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant” (Ellerbusch, 2006, p. 559).

In order to better understand the scope of brownfields remediation in the US, Herbele and Wernstedt (2006) examined the EPA task force report, existing literature from both academics and practitioners, and six empirical brownfield studies that

systematically characterized brownfield projects. Several of their conclusions are relevant for this study. Herbele and Wernstedt found that while brownfields can occur in a range of settings, they typically are found in areas with higher concentrations of minorities and households below the poverty level than state averages. Also, while many sites had a history of industrial use and contamination, there were many other non-industrial sources of contamination. The majority of post-redevelopment uses were economy driven. In their review of reports from the IEDC , Herbele and Wernstedt found that 64% of the uses were industrial or commercial, and only 13% were cultural and recreational. Finally, community support was mixed. Garnering community support in settings with distrust because of injustice can slow down the redevelopment process, but the majority of the evidence supports the idea that early community involvement can enhance the project's bottom line. Unfortunately, less than one quarter of the municipal respondents to the USCM survey listed community concerns as an important issue in redevelopment. In conclusion, Herbele and Wernstadt suggested that coordinating brownfield redevelopment of multiple sites could have financial benefits for property values, environmental insurance, public and private financing, and risk sharing.

Ellerbusch (2006) conducted an exploration into the risk inherent in brownfields and redevelopment with a focus on property and community value. He used a series of risk trade-offs from the literature as a framework for risk-to-risk analysis in order to better understand the way risk can shift. He found this connection of risks is an underlying factor in the prevalence of brownfields in socio-economically disadvantaged neighborhoods. Property left to decay lowered the value of neighboring properties, which lead to further abandonment, same as abandoned property that provided a harbor for

crime and other activities drove away those who could afford to leave. Ellerbusch found that studies are often only analyzed for the reduction of the target risk, or in economic terms, and fail to account for transformations of risk. Ellerbusch suggests that community participation may be a useful tool for identifying non-economic countervailing risks. One successful example of community participation he discovered was hands-on participation in community gardens. The gardens stimulated community involvement, but also mitigated other risks by encouraging democratic engagement, boosting self-sufficiency, reducing environmental impacts, and improving economics related to food costs. Ellerbusch concluded that while the temptation to simplify brownfield risks as a financial analysis is great due to the large number of stakeholders that are impacted, without community consultation for non-economic risk identification, the analysis would not be justifiable.

In summary, brownfields are vacant or abandoned properties that have real or perceived contaminants that pose risks to the community. The risks can be economic, social, and/or environmental. Brownfields are often concentrated in socio-economically disadvantaged neighborhoods or near large minority populations. Re-development of brownfields can be complicated by shifting risks that are not always obvious, but community participation can greatly improve the identification and mitigation of many types of risk. Concern about shifting risks is an underlying factor in the environmental justice movement and is an important piece of brownfield redevelopment. Literature discussing the importance of public participation in the decision-making process is presented in the next section.

Public Participation

The evidence that brownfields are connected to health risks, crime, environmental degradation and to socio-economically disadvantaged communities (Gallager & Jackson, 2008; Herbele & Wernstedt, 2006; Solitare, 2008; Zarcadoolas, Timm, & Bibeault, 2001) creates concerns related to environmental justice (Ellerbusch 2006, Gallager & Jackson, 2008; Shulman, Katz, Quinn & Srivastava, 2005; Thomas, 2003). Satisfying the demands of environmental justice requires respecting, listening, and engaging the existing community in the planning of changes that will affect their future regardless of their socio-economic, educational, or cultural characteristics (DePass 2006). One way to uphold the values of environmental justice in brownfields redevelopment is to promote public participation in the decision-making process. In doing so, project organizers support democracy, increase public understanding, empower the community, reduce some obstacles that can block progress, and minimize costs (Solitare, 2008). Perhaps most importantly, involving the community can improve the quality of the decision through the addition of local knowledge, and can increase the legitimacy in the eyes of the public so they are more willing to accept the outcomes (Solitare). Public participation does have potential downsides such as time delays, increased costs, conflict that alienates or fosters intolerance (Solitare), and the multitude of calls for participatory planning have not translated to rewarding interactions and sustainable outcomes (Greenberg & Lewis, 2000; Gute, 2006; Solitare).

To better understand what is involved in successful community participation, Gallager and Jackson (2008) investigated four case studies, as part of a larger study of 50 state brownfields programs, to see how different types of involvement opportunities used

by developers and community support organizations succeeded or failed to increase awareness, build trust, and improve community participation in brownfields decision making. The study used one low participation level program, two medium participation level programs, and one high participation level program from the larger study.

Participation levels were defined as: low- level participation only employed the public record, medium-level participation utilized public record and public notice/hearings/or meetings, and high-level participation included all of the lower level tools along with opportunities for involvement and community participation grants. For each case study, the authors used participant interviews, press releases, photographs, environmental reports, and newspaper articles to document the results of the subsequent community involvement. Their study showed that community involvement, done right, can promote the desired outcomes, but done wrong, can impede redevelopment progress. Successful projects balanced time and resources spent on genuine community involvement with those spent on critical project objectives and timelines. Developers and community support organizations that worked to promote environmental justice were more successful especially in socio-economically disadvantaged communities when they went beyond formal meetings and hearings because public record notices and public hearings required the community members to locate the opportunity themselves and assumed that they would know to look for it. Flexibility and adaptation goes a long way to reach successful redevelopment outcomes, and can pay off in future interactions with that community.

In order to further address the concerns raised by unsuccessful projects, Solitare (2008) explored the conflict between ideal participation and reality in current redevelopment actions and to understand factors involved in creating more effective and

meaningful public participation in environmental decision-making. To explore the conflict, Solitare chose a qualitative method that utilized data from documents, observations and interviews in eight neighborhoods with brownfield redevelopment projects. Aside from individual personality traits and socio-economic characteristics, Solitare identified five situational prerequisites for meaningful participation that should be addressed in future policy decisions. The five prerequisites were derived from literature on public participation in environmental decision and planning and applied to eight case studies in Boston, MA and Houston, TX. The prerequisites outlined were, (1) commitment to involvement by all stakeholders; (2) awareness of opportunities for participation; (3) available time resources to commit; (4) trust in other stakeholders to be honest and fair; and (5) perception that the issue is a problem. The application of these prerequisites to current actions showed that overcoming these concerns requires localized and situation-specific interventions that can blend the perspectives of the developer/governments with the local community for a shared vision of the future.

Since a shared vision is vital to beneficial public participation (Ellerbusch et al., 2006; Solitare, 2008), Greenberg and Lewis (2000) considered that another possible reason for the failure of public participation programs was that community agendas do not always agree with city officials and developers (De Sousa 2006; DePass, 2006; Greenberg & Lewis, 2000; Solitare 2008) and so there was a need for a better understanding of the preferences of the community, and minorities in particular. They proposed a mixed methods study to answer the questions: (1) What are residents' preferences for redevelopment, and (2) Which residents are likely to participate. The study surveyed 200 residents of a largely Hispanic community in Perth Amboy, NJ.

Results of their survey found that in contrast to the redevelopment goals of officials and planners, who want new factories and businesses for economic considerations (Greenberg & Lewis, 2000; Herbele & Wernstedt, 2006), the community preferences were for community facilities including parks and recreational areas (top preference), cultural facilities, and health facilities. The lowest rated options were the commercial uses including warehouses, factories, and stores. Their study provided concrete evidence of a disconnect between the economically driven agendas of brownfield legislation and the community preferences.

De Sousa (2006) proposed that this disconnect between economic benefit-driven development and the preferences of the community for parks and recreational areas could be bridged by the greenspace initiative. In order to present more information concerning the benefits of brownfields to greenspace projects, De Sousa conducted a qualitative study on the quality of life impacts of three brownfields to greenspace projects on the affected communities. The study surveyed a combined total of 479 individuals in the three project sites and used 21 characteristics garnered from literature on quality of life and sustainable communities. The majority of those surveyed focused personal benefits like aesthetics, fitness and social interactions rather than on economic benefits. As with Greenberg and Lewis (2000), De Sousa's study found that 90% of those surveyed felt that greenspaces were a good use for brownfield sites and that the greening of brownfields was viewed as a way to connect people to each other, and connecting people to their environment. Areas like greenspaces were perceived to have a high quality of life and could act to draw people and investors back into a previously abandoned or avoided area in the community.

A movement that ties together community participation and empowerment with greening and quality of life is community gardening. The American Community Gardening Association (ACGA) estimates there are over 18,000 community gardens in the US and Canada (EPA, 2009). As city residents become more aware of the food they eat, they increasingly seek to be more informed as to where their food comes from and often seek local producers. Converting brownfields to community gardens is one popular option because of its support of revitalization of the community, taking an area that had a negative impact and making it an asset to the community (De Sousa, 2006). A qualitative study conducted in the UK by Holland (2004) suggests that the community garden movement is a possible model for linking social and economic policies at the local level.

In summary, community involvement can be an important component to a successful brownfield redevelopment, but steps must be taken to ensure meaningful participation or it can actually become an obstacle to success. In order to ensure sustainable commitment to meaningful participation, all stakeholders must share an understanding of the problem and a vision for the future so they can make sound decisions. Developers and community organizations need to adapt to the specific site needs, and not rely on methods that require the community to educate themselves and uncover their own opportunities to be involved. Neighborhoods have been shown to prefer parks or cultural development over the industrial and commercial plans pushed by municipalities trying to reach economic goals. Community gardening has been shown to be successful in meeting the needs of both municipalities and neighborhoods. Moreover, community gardening also promotes democratic engagement, and empowers neighbors to help improve their own community. However, in order to assist in productive decision-

making, the public needs to have access to information that is often technical and hard to understand. The following section discusses the challenges in meeting the technical information needs of the community.

Technical Information Needs

The Earth Summit in Rio de Janeiro in 1992 produced *Agenda 21*, a framework for sustainability that highlighted communities and community environmental education and other keys to working toward sustainability (Holland, 2004). Tilbury and Wortman (2008) addressed the challenge given in *Agenda 21* and the *World Summit on Sustainable Development Implementation Plan* by reviewing several methods for community environmental education programs currently in use in Australia. The purpose of the study was to assess whether the programs actually led to the long-term sustained change in actions and behaviors called for by *Agenda 21*. The qualitative study looked at samples of programs from three different types of community education programs: community action programs (hands-on volunteering, habitat restoration, tree planting, clean-ups, etc), social marketing programs (television ads, radio, or newspaper ads), and interpretation programs (signs, guided tours, educational materials, displays, and electronic media). Examples of each type were examined for assumptions, successes, and if it led to long-term change in thought processes and behavior. The projects with the best rate of success in long-term change from all three methods, were the ones that focused on learner-centered and action oriented education because they led to increasing awareness of visioning, critical thinking, democratic engagement and action-taking skills. Social marketing was found to be the least beneficial because it has to assume behavior change with no follow up or monitoring and is usually targeted at a very general audience and as

a result does not connect to the learner on a personal level. Ironically, social marketing was found to have the most government funding. In conclusion, the authors highlight the need to shift government funding toward sustainable long-term change and to make all methods more learner-centered including adapting for cultural and linguistically diverse learners.

As part of a review of current issues concerning information requirements and mechanisms for delivery and their role in promoting participation, Thomas (2003) surveyed residents of the Delray neighborhood in Southwest Detroit who had originally been left out of the decision-making process, but were now being included. He identified several questions being asked by the residents that required the dissemination of technical information before they could make educated decisions. The questions were: (1) What are the environmental conditions on the site? (2) What are the redevelopment options for the site? (3) What are the relative risks to local residents if we do not redevelop (and remediate) the site? (4) What are the relative risks to local residents while redevelopment is occurring? and (5) What are the relative risks to local residents from operation of proposed alternative developments? To answer these questions, Thomas found that participants needed access to financial, legal, social, and environmental data in a format that they could interpret and was relevant to their concerns. In conclusion, Thomas found that appropriate information dissemination could help diffuse emotional responses and allowed the sharing of information and reduction of conflict.

Gute and Taylor (2006) chronicled the methods used to promote sustainable brownfields redevelopment including characterizing and communicating risks to the local community. The review covered projects in two neighborhoods, West End and East End

in Bridgeport, CT. At the time of writing, East End was in the beginning stages, and West End was well into the process. In West End, the goal was to expand current athletic fields by incorporating the rest of the block, which held two industrial properties. The project encountered an important breakthrough when they held a community design workshop, which directly engaged the end-users in the planning process and helped to form a strong partnership between stakeholders. The workshop was held in tandem with a series of public safety meetings aimed at assessing and communicating risks. It was necessary to first meet the community's initial concerns about public safety before they were ready to proceed and discuss environmental and health concerns from the chemical contaminants. The authors found that transparency through timely and accurate disclosure of all potential risks was essential to maintain trust and provide the community with the information to make empowered decisions. The West End project also reached out to the impacted schools by engaging science students in documenting the risk assessment/communication process and holding a career day for the professionals to share their experiences with students. Students and staff were also included in the design and planning stages. Gute and Taylor concluded that all stakeholders (especially end-users) should be involved from the beginning and at each decision-making step, that transparency in reporting environmental data is essential, that the community's initial concerns must be considered before broaching new risks and threats, and the focus of outreach and education must assist the community to understand the remediation process and how remediation strategies will include both future use and current risks.

Zarcadoolas et al. (2001) also found that the push to promote public involvement has not included the creation of decision-making tools that are readable and reflect the

concerns of the residents. To meet this concern they partnered with residents of two minority communities in Providence, Rhode Island with current or proposed brownfield redevelopment projects to create a guide to health risks associated with brownfields. The team included health experts, literacy and design experts, representatives of community groups and developers, and 10 community residents. They used focus groups and interviews to explore perceptions of the neighborhood and environment, understanding of pollution and toxins, and views on the brownfield sites including how to get information about the sites and their concerns. All sessions were videotaped and audiotaped and a synopsis of the session was distributed to the participants. The team then collaborated to construct the content and assess the language and layout used. This method of collaboration, which they call “cooperative composing,” allowed the team to evaluate how residents interpreted the information and to identify further questions the information raised. In conclusion, Zarcadoolas et al. found that cooperative composing demystified the science and made it more approachable allowing the residents to “own” the information and utilize it better.

In summary, being personally involved in hands-on or action oriented programs can lead to an appreciation of the need to restore degraded land, but maintained involvement also requires a true understanding of risks and the restoration process and the incorporation of visioning, critical thinking, democratic engagement and action-taking skills. Participants also require a good understanding of the technical information concerning brownfields if they are to be meaningfully involved in the decision-making process and acquire a sustainable attitude toward environmental problem-solving, but disseminating that information is still challenging, especially in light of the need for

transparency between stakeholders at each step in the process. This requires educational components that meet the specific needs of the community including language and cultural issues. The next section reviews research into factors that influence the effectiveness of free-choice learning programs including the individual's personal motivations and agenda and learning as part of a community

Free-Choice Learning

Free-choice learning includes programs and institutions that support continuous learning outside the school or workplace. Some programs include museums, television and radio, print media, and community groups and clubs. Free-choice learning was once overlooked in educational studies but there is a growing awareness that as much as half of the public's understanding of science comes from free-choice learning (J. Falk, 2002). By the very nature of their settings, the learning outcomes of free-choice learning programs must be considered within a web of dynamic social factors and the reality that the complex changes in understanding that result in changes in behavior and attitudes can take large spans of time and a multitude of experiences. (Storksdieck, Ellenbogen, & Heimlich; 2005).

One social dynamic that has received attention is the ability of visitor's pre-visit agendas to directly influence their learning from free-choice learning programs. To explore the significance of visitor agendas on learning outcomes J. Falk, Moussouri, and Coulson (1998) conducted an investigation with 40 randomly selected adult visitors to the Geology, Gems, and Minerals exhibit at the Smithsonian Institution's National Museum of Natural History. In order to detect the influence of pre-visit agendas on learning, the team created two instruments—one tool to measure visitor learning and one to measure

visitor agendas. Visitor personal agenda was further separated into two subdivisions: motivations for visiting and strategies for organizing their visit. The six motivational categories identified for the study from previous research were: place, education, life-cycle (his parent took him and now he is taking his child), social event, entertainment, and practical issues (entrance fee, weather, driving distance, etc.). The categories for strategy were: unfocused (no plan), moderately focused (general plan but flexible), and focused (specific plan). The study found that there was a significant relationship between learning gains and three of the motivation categories—high educational motivation, high entertainment motivation, and low practical issues motivation. High education and entertainment motivation were found to be independent and resulted in higher learning gains regardless of other motivational factors. Education and practical issues were found to have a strong inverse relationship. The study also compared each motivation with the length of time spent in the exhibit because length of stay has been shown to have a direct relationship with learning. Only high entertainment motivation was shown to result in a significantly longer length of stay. There was also a significant relationship between strategy and length of stay. More focused strategies resulted in longer length of stays in the exhibit, and visitors with a highly focused strategy showed greater learning gains. The final result of the study was that social group also had a significant effect on learning. Individuals who visited alone showed higher learning gains than those who visited with a group. J. Falk's assessment of visitor learning and behavior supports the idea that Free Choice Learning is influenced by visitors' strategies and motivations and that these factors, along with social group dynamics, are important to consider in designing Free Choice Learning programs.

The influence of social group dynamics on free-choice learning was also explored by I. Falk (2007) who proposed that learning in a community setting requires a different approach than the traditional method of looking at group learning as a sum of isolated individual behavior and understanding and could be used to help define sustainability. I. Falk defined community learning as learning events shaped around shared value-sets, where the overall purposes for the learning events were identified and shared community values. The study examined how valued knowledge and skills were socially constructed through a review selection of learning communities that had been previously classified based on sustainability. The study found that learning as a community or group was highly dependent on the social and economic dynamics of the community including the speed of change, capacity for growth, distribution of knowledge, collaboration, technology, and flexibility. Because of this, a measure of community learning could be used as a proxy for social capital and sustainability. The knowledge and skills that were valued was determined by the group's underlying values and common purpose for learning, as well as the results of interactions between unshared values. I. Falk concluded that community learning is driven by how the community responds to the interactions of shared and unshared social values.

In summary, free-choice learning in a group or community is greatly influenced by both the personal agendas of individuals within the group and whether those values are shared by other members of the community.

The purpose of this study was to observe how a residential brownfield restoration and community garden project like the Emerson Street Garden develops and to explore the experiences of participants. Building on the work of Zarcadoolas et al. (2006), this

study investigated the effectiveness of several educational components used in combination with a design planning workshop to impact participant's understanding of risks, and intent to act. This study also compared participant feedback with ideas from other free-choice learning research including the findings of J. Falk, et al. (2007) regarding the impact of motivation and agenda on learning outcomes and how they translated from a museum environment to a community project.

Chapter 3: Research Methods

This study explores the complexities of implementing a community garden at a residential brownfield site in low-income neighborhood with a high minority population. It uses an exploratory case study design to investigate how this type of project grows over one year and how the project impacted individuals from the community including: who chose to participate, what motivated individuals to become involved and remain committed, and how the individual's understanding of the project's risks and plans change throughout his/her involvement. The study took place in the King Neighborhood in NE Portland, Oregon, and followed 17 participants during one year, from April, 2010 to April, 2011. The participants involved in the study joined at varying times, some are still involved and others are no longer involved in the Emerson Street Garden project. The Emerson Street Garden project is ongoing and began prior to this study.

Although the study follows an exploratory case study design, several questions were raised from the literature and used as a lens through which the data collected during the study was analyzed. Thomas (2003) and Zarcadoolas et al. (2001) raised the question: *How do educational outreach components impact the participant's understanding of conditions at the site, remediation options for the site, understanding of risk at the site before, during, and after remediation, and intent to act.* Another question was drawn from the work of J. Falk, et al. (1998, 2002, 2010) regarding the influence of personal motivation and prior agenda: *How do personal motivations, prior agenda, and view of community impact retention and application of knowledge that result in a sustainable project.* A final question arose from the work of I. Falk (1997) concerning learning in

community and sustainability: *How do shared values and the distribution knowledge impact the Emerson Street Garden working group and the potential for the future inclusion of local schools and kids clubs?*

Population

This study was conducted in the King Neighborhood in NE Portland, Oregon, and centered around the brownfield site at 822 NE Emerson Street. An exploratory case study was designed to gain insights and perspectives that spanned generations and ethnicity. As such, outreach efforts for involvement in the Emerson Street Garden project were targeted in the 5-10 blocks surrounding the site, but was open to any interested individuals within King Neighborhood or outside the neighborhood. 822 NE Emerson falls within Multnomah County Tract 33.01 of the US Census data.

In 2000, there were 3,223 individuals living in the census tract containing the Emerson Street Garden. The majority, 48%, were African American with the second most common ethnicity, White/Caucasian, coming in at 28%. The 2010 census which was being conducted at the same time as this study showed a reversal in numbers with 56% White/Caucasian and 25% African American and an overall population loss of 235 down to 2,988 (Friesen, 2011). The demographic changes in US Census Tract 33.01 can be seen in Table 2. The increasing numbers of whites moving to the King Neighborhood as shown by US Census data from 1990 to 2010 can also be seen in Figure 1.

Table 2:

Population Changes Tract 33.01 from 1990 to 2010 (Friesen, 2011).

Demographic Group	1990 US Census		2000 US Census		2010 US Census	
	N	%	N	%	N	%
White/Caucasian	745	28.3	897	27.8	1661	55.6

African American	1601	60.9	1553	48.2	742	24.8
Asian/ Pacific Islander	45	1.7	100	3.1	52	1.7
Latino	133	5.1	426	13.2	359	12.0
Native America	65	2.5	32	1.0	12	0.4
Multiracial	---	---	209	6.5	151	5.1
Other	41	1.5	6	0.2	11	0.4
Total	2630	100	3223	100	2988	100

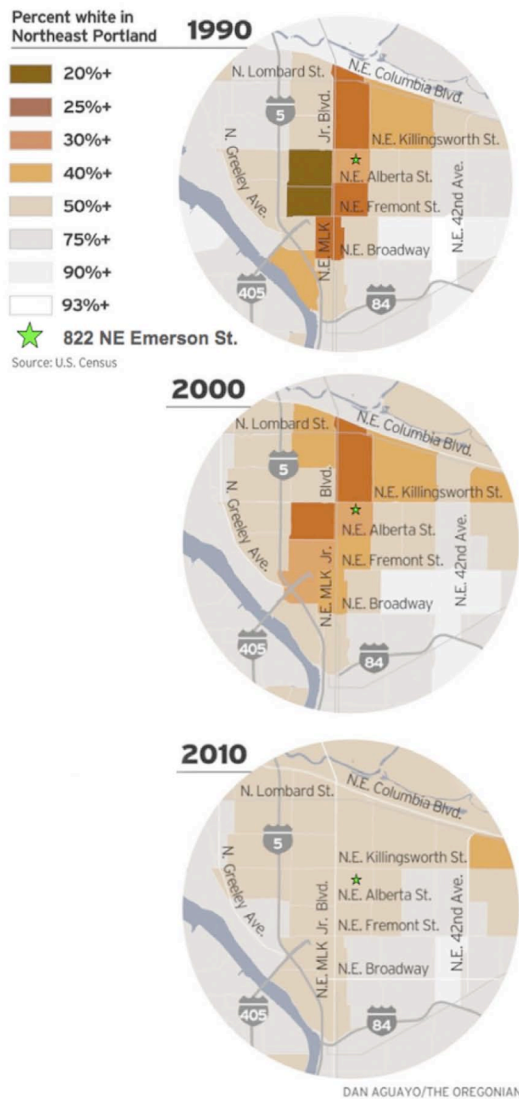


Figure 1: Percent White Population in NE Portland Communities. The shift toward lower concentrations of minority groups since 1990. (Figure adapted from Hannah-Jones, 2011)

Participants

Everyone participating in the Emerson Street Garden project was invited to participate in this study. Attendees at the design charrettes were offered the opportunity to complete the post-charrette survey and/or to be interviewed about their experience. The final survey was offered to individuals participating in the working group for the Emerson Street Garden one-year after the design charrettes.

While approximately 60 individuals attended the charrettes, 11 participants completed the post charrette survey, and of those 11, eight also participated in the interview process. Additionally, two individuals chose to be interviewed but did not complete the survey. The one-year follow up survey was offered to 16 regularly-attending members of the Emerson Working Group who were present at the April, 2011 meeting. Of those 16, eight voluntarily completed the online survey. The total number of participants involved in the study was 17. Further details describing the participants will be presented in the results; however, it is important to note that the individuals who volunteered to participate in this study did not accurately represent the ethnic profile of the neighborhood or Emerson Working Group in general. Of the 17 participants 12 were women, and of those women nine were Caucasian, one was African American, and two were Asian (specifically Korean). There were five men who volunteered to participate in the study, four were Caucasian and one was African American.

The study was originally intended to be a pre-post assessment of the knowledge gains displayed by participants after attending the design charrettes. However, as the project and study developed, it became clear that a case study design was more appropriate to uncover participants' ideas and understandings related to brownfields and

the garden project. Interviews and field notes provided richer insights and a more comfortable context for participants to share. This was in part because many individuals seemed reluctant to participate in the study. Residents of King Neighborhood, like those in many high-poverty, high-minority urban communities have faced a long history of marginalization and exploitation. These historical, social, and cultural experiences contributed to an underlying sense of distrust among community members. The case study approach helped alleviate these issues.

Activities and Data Collection

During the year that the study was conducted, several activities took place as shown in the timeline in Figure 2. None of the participants were involved in all of the activities, but each participant was involved in at least two activities.

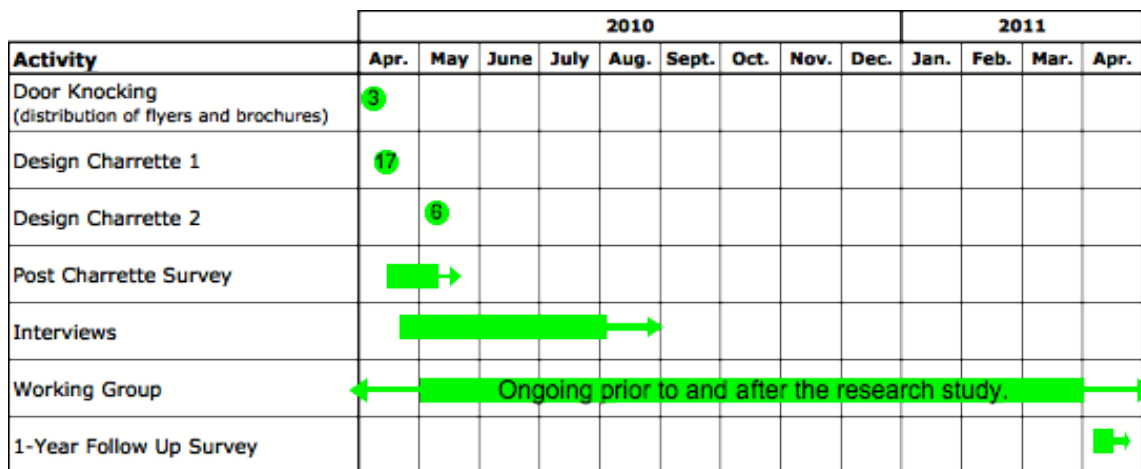


Figure 2: Timeline of Activities During the 1-Year Study. Numbers indicate the date of one-time events.

Door-Knocking. The first activity was a door-knocking event held on April 3, 2010, during which flyers and brochures were distributed to local residents and left at local businesses, and members of the working group had an opportunity to encourage

neighbors to join the project. Observations made during the door knocking focused on response attitude, response characteristics from ethnic groups, and the number of people who responded that they intended to attend a charrette or would like more information about the project.

Flyers. The purpose of the flyers was to announce the project to the neighborhood, raise awareness of the problem, and to invite the community to participate in the charrettes. On the flyer the site was described as a vacant lot/brownfield that needed a transformation to be clean. It designated the goal of creating a community garden and the focus of working together and importance of input from the reader. Flyers were distributed to 162 residences and also to local businesses. Variations of the flier included both color and black and white versions of both an English flyer and a Spanish flyer (Appendix C-1). The flyer included a map of the site location and a picture of a previous gardening activity with children at the site. The children in the picture were all of African American decent.

Brochures. The brochure was distributed to neighbors who answered their door during the door knocking, and to local businesses and organizations. The brochure briefly described the dream of a community garden that began in 1995, explained the current lead contamination concerns and the source of the contamination. It did not specifically mention the terms brownfield or phytoremediation, but talked about contamination and explained the process of moving the soil and using plants to clean up the lead. Like the flyer it included information about the charrettes and focused on the importance of the readers input and community participation. Unlike the flyer, it was only printed in color and in English (Appendix C-2).

Design Charrette 1. The first design charrette was held at the Blazers Boys and Girls Club, which is within walking distance of the site. A total of 34 individuals attended the first charrette, including two youth, four children, and five seniors. During the charrette, a presentation was given that explained the history and current conditions at the site, as well as the risks and proposed remediation process. This was followed by a World Café style discussion about the site design and vision for how the garden should be used.

Design Charrette 2. The second design charrette was focused especially on seniors and a shuttle was provided to encourage attendance. The second charrette was held at the Multicultural Senior Center, which is a little further away from the site but still within walking distance. Approximately 30 individuals attended the second charrette, the majority of whom were seniors. Some participants at the second design charrette had also attended the first. Charrette 2 followed the same format as Charrette 1—a presentation that explained the history and current conditions at the site, as well as the risks and proposed remediation process, followed by a World Café style discussion about the site designs and the vision for how the community should use the garden. The main difference in the second charrette was that three potential site designs that had been developed from ideas generated at the first charrette were also presented to be part of the discussion.

Post Charrette Survey. A survey was given after each of the design charrettes. It was designed to assess the participant's understanding of the project including brownfields, potential risks, and community gardens. The survey contained questions to assess knowledge gains, understanding of risks, intent to act (continued participation), and personal motivations, as well as questions regarding demographics. The survey also

asked questions related to the individual's preferred method for receiving information. The survey used a variety of structured and unstructured question response formats including fill in the blank, single and multi-option check the answer multiple choice, Likert response, and free response. The survey was provided in paper form with a pre-addressed/stamped envelope for return, or the individual could provide their email address for a link to an electronic version of the form.

Interviews. Individual interviews were offered to anyone completing the survey or who declined the written survey but wanted to participate in an interview. The interviews took place in the participant's home or personal choice of location. The interviews looked at the design and impact of the educational components, personal motivations for participation, view of the community, concerns about the project, and suggestions for future activities. The interviews were semi-guided with free response questions.

Working Group. The Emerson Working Group (EWG) is a group of individuals representing different stakeholders in the project including the property owners (Oregon Sustainable Agricultural Land Trust, OSALT), community organizers (Groundwork PDX), neighbors, and local schools and organizations. The group was already meeting before the project started and they planned and implemented the door-knocking campaign and design charrettes. Anyone is welcome to join the EWG, and members are not elected or appointed. The EWG is responsible for making decisions about the final design and uses of the garden, including organizing the ground breaking, digging/planting parties, and inclusion of local schools. The areas of responsibility for the EWG were developed

from feedback collected during the charrettes and incorporated into a concept map as show in Figure 3.

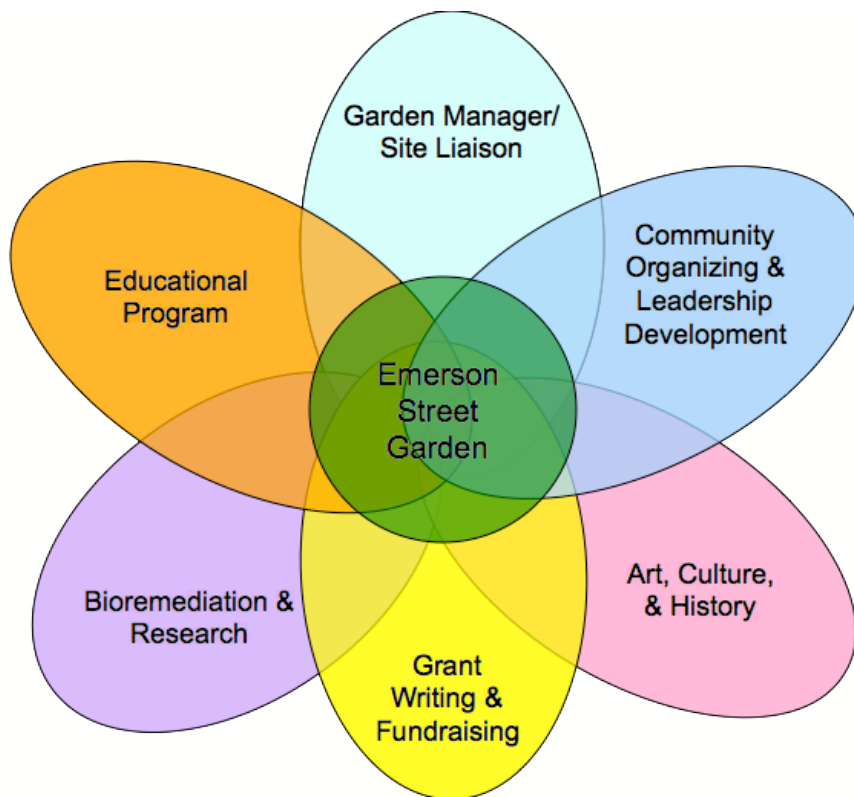


Figure 3: Concept Map of Working Group Responsibilities.

1-Year Follow Up Survey. A final survey opportunity was offered to the Emerson Working Group one year after the design charrettes. It was designed to assess the understanding of individuals still participating in the project one year after the original activities. In particular, the survey focused on retained knowledge, personal agenda, and shared/unshared values relating to education and other project goals. The survey opportunity was presented at an EWG meeting in April, 2011 and offered via email to anyone on the EWG. The survey was conducted using an online service. The one year follow up survey (Appendix A-3) included structured dichotomous (true/false)

questions with free response follow up questions, uni-dimensional continuous scale response questions, and free response questions.

Data Preparation and Analysis

The study had three phases of data analysis. The first phase was open coding during which each of the survey responses and interview transcripts were reviewed to look for re-occurring keywords and ideas. These concepts were then used in a second, axial coding process where comments and ideas were organized based on the themes that had been identified from both the data and the literature. Six colleagues independently reviewed the same randomly selected interview transcript to check for consistency of the identified themes. Finally, the responses were then aligned with the questions raised in the literature and themes from the axial coding. The emerging motivational themes were also compared to the six motivational categories for free-choice learning in a museum environment identified by J. Falk et al. (1998). As a result, five motivational categories for the study were identified with some overlap and some expansion from J. Falk's six categories. The levels for prior agenda used in this study (unfocused, moderately focused, and focused) were also compared to and adapted from J. Falk. Samples of the coding processes are provided in Appendix B.

Chapter 4: Results and Findings

During the course of this study a variety of activities were conducted as part of the Emerson Street Garden Project. The study participants were given the opportunity to reflect on those activities through a post charrette survey, an interview, and a follow-up survey given one year after the initial charrettes. Their feedback was analyzed in order to better understand the evolution of a community garden project on a residential brownfield in a low-income community with a large minority population and the impact on individuals participating in the project. Questions from the literature focused the investigation on (1) the effectiveness of several outreach activities, (2) the impact of personal motivations and prior agendas on understanding of the project's risks and plans and on the individual's continued involvement, and (3) any changes in the participant's understanding of the project's risks and plans throughout his/her period of involvement. All participation was voluntary and varied based on the individual. A summary of activity participation by each individual is shown in Table 3. All participants have been given a pseudonym to maintain confidentiality.

Table 3:

Participation in Activities by Study Participants

	Door Knocking	Design Charrette 1	Design Charrette 2	Post Charrette Survey	Interview	Working Group	Follow Up Survey
Kelly	✓	✓	✓	✓	✓	✓	
Emily		✓		✓	✓		
Amy		✓	✓	✓			
Debbie		✓		✓			
Jenna		✓		✓			
Jane	✓	✓	✓	✓	✓		
Stanley		✓	✓	✓	✓	✓	✓
Sheila		✓	✓	✓	✓	✓	✓
Lynn		✓	✓	✓			
Sally			✓	✓	✓		
Carol		✓		✓		✓	✓
Nathan		✓			✓	✓	✓
James	✓	✓	✓		✓	✓	
Robert						✓	✓
John						✓	✓
Linda						✓	✓
Susan	✓	✓	✓			✓	✓

Door Knocking

The door-knocking event took place on April 3, 2010. Overall there were no strong negative responses to the proposed garden. However, the door-knockers did encounter hesitancy from neighbors without strong English skills. Despite having a flyer in Spanish, communication was difficult because project representatives only spoke English. One surprising observation was that there had been a considerable change in demographics from the census data collected in 2000. This observation was confirmed by the 2010 census data that clearly showed a shift in diversity (Hannah-Jones, 2011; Friesen, 2011).

Impact of educational components. Research by Thomas (2003) and Zarcadoolas et al (2001) prompted the consideration of how educational outreach components impact participants' understanding of conditions at the site, remediation options for the site, understanding of risk at the site before, during, and after remediation, and intent to act. Two educational components were used during the door knocking activity: the flyer and the brochure (Appendices C-1 and C-2).

Flyer. Flyers were distributed during to the door-knocking to all local residences visited and left at local businesses. When reflecting on the flyers, several participants recalled seeing the flyer, but only Nathan remembered receiving it at his home, the others only mentioned seeing it before or at the charrettes. Several participants suggested that the flyer could have been clearer about what exactly would be happening at the charrette and what its purpose was. Additionally, Emily and Sally pointed out that the flyers could have been distributed over a much larger area. Only Nathan attributed the information presented in the flyer as motivation for him to attend the charrette. The most influential information he recalled from the flyer was that the project was in his neighborhood and about gardening.

Individuals found different versions of the flyer more appealing. Sally appreciated the warmth and neutrality of the colored flyers referring to them as looking "very professional" and "not amateur looking." In contrast, Nathan preferred the black and white version because "When I see something all flashy and color I think it is Comcast trying to sell me something," and "the fact that it looked sort of grassroots might have actually attracted my attention a little bit." All the interview participants spoke English and only Jane commented that the Spanish flyer was "necessary."

Overall, none of the participants linked the flyer to specific information they learned about the site, except that the plan was to have a community garden. The term brownfield did not spark any curiosity except with those who already knew what a brownfield was, and no one else understood the phrasing on the flyer to mean that the site was contaminated.

Brochure. The brochure was distributed to neighbors who answered their door during the door knocking, and also to local businesses and organizations. Jane credited the brochure as the most useful method for learning about the project because it had more information than the flyer, but felt that both served their purpose. Nathan also found the brochure to be useful for getting information because “it allow[ed] me time to think about it.” Several participants mentioned seeing the brochure at the meeting, but did not spend much time reading them. Sally, for example, said she “didn't see any written materials prior to coming to the design forum, and then while I was there I briefly looked over a couple of things...I kind of wish in retrospect I had retained any of the written materials to actually really read them.... None of the written materials got my full attention at any point.”

Overall, only Jane reported that she took time to read the brochure carefully and she did not specifically mention what information she learned from the brochure as opposed to the other educational components.

Design Charrettes

Unlike lecture style public meetings, the design charrettes were intended to involve the community in active decision-making, as well as provide information and an opportunity to ask questions and voice concerns. Feedback from the study participants

regarding the design charrettes related to several questions raised in the literature about the impact of educational components, motivation and agenda, and shared values.

Impact of educational components. Like the flyer and brochure, one goal of the design charrettes was to increase the awareness of the risks involved with brownfields and the lead contamination at the Emerson Street Garden site. Three individuals that reflected the types of responses shared by the study participants' were Nathan, Jane, and Sally.

Nathan. Nathan was born in Portland and bought a house in this neighborhood about seven years ago. He heard about the project from the flyer and attended both of the charrettes. When asked about why Emerson Street Garden was considered a brownfield, Nathan specifically mentioned the lead contamination in the soil and commented that there were probably other contaminants too. He had heard of brownfields before, but didn't have a lot of experience with them. He mainly knew about them from learning about their impact on property values while he was looking to purchase his house. He mentioned a property right across from his house that he considered a brownfield, but he didn't know if it had actually been classified as one. Nathan also mentioned two other lots previously used as industrial properties that were considered to be brownfields. He later clarified that the properties were condemned, and he wasn't sure if being a condemned property was the same as being a brownfield. Both properties have since been redeveloped. In his interview, Nathan remembered asking about what remediation process was being considered, and whether the contamination accumulated or dispersed. However, he felt he was better equipped to understand the technical details because of his educational background and did not know if everyone at the forum would have

understood terms like legal limits, background levels, and parts per million. He could see “that maybe some people didn’t feel comfortable with the 7 parts per billion in the background level being normal,” (the actual background level reported in the presentation was 17 parts per million). He felt that the original owners should be responsible for clean up as much as possible, but that brownfield redevelopment is really a social issue. He plans to remain involved as long as he is in the neighborhood.

Jane. Jane is 56, Caucasian, and has lived in her house that is within walking distance of the Emerson Street Garden site for about five years. She first learned about the project from a sign at the site and had been attending the working group regularly before the forums. She was part of the planning team, and attended both charrettes. During the first charrette, Jane said she didn’t pay much attention to the presentation because she had heard a lot of the information before. She was also distracted by the sound in the gym. There was a storm and it was difficult to hear. At the second charrette, she could hear a lot better and felt the presentation was helpful and that the presenter did a good job explaining. Jane acted surprised when asked if she felt she was given the truth about the contamination concerns, as if she hadn’t considered that the presenters would be ambiguous about the risks. She felt the information was clear that there was some contamination and that the goal was to “reach below the average.” She did mention later that she had tried to get more information from the Groundwork website at one time during her involvement in the project but couldn’t find any. The charrette did present some information that she did not know previously and “brought some things to light that [she] wasn’t familiar with.” When asked what it meant to say that the Emerson Street Garden is a brownfield, Jane was able to recall pieces of the definition used in the forum

presentations, but did not mention specifically lead contamination. She said that the Emerson Street Garden site was considered a brownfield because “It has been abandoned or neglected to the point of . . . it’s been shown to have contamination and therefore, . . . it isn’t just up for grabs, it needs to have some process.” She remembered hearing the term brownfield before but didn’t really know what it entailed until she began working on the Emerson Street Garden project. When asked about other possible brownfields in her neighborhood, Jane said she was sure there were others. Although she couldn’t identify a specific site, she described several locations that had “a lot of debris and old buildings . . . weeds and some of them are you know, trashed . . . some of them have become dump sites.” Jane was also very concerned about the sites being places for drugs and homeless camps. She wasn’t interested in working on another brownfield site. She hoped someone else would, specifically Groundwork and the city, but she was more concerned about Emerson because it is in her “clutches” and she “can get to it.” Jane has learned a lot from being involved in the project and Charrette 2 provided some new information. She had a good idea of the basic definition of a brownfield, but was clearer about the risk from degenerate activities from the abandonment of the site than from the lead contamination. She planned to stay involved in the project because she had invested a lot in it up to this point, but wasn’t interested in any similar projects outside her immediate influence.

Sally. Sally is 34, Caucasian, and does not live in the neighborhood, but was interested in community development and working with seniors. She heard about the project from an organizational email and attended the second charrette. When discussing the presentation at the charrette, Sally said she thought it was fairly informative. She

mentioned seeing “the exact lead levels that are on the site and how that compares to . . . the normal background and what . . . the EPA consider[ed]” to be acceptable. She felt that was good information to have at the charrette because “it’s not information [she] has at her fingertips.” She mentioned specifically remembering that information because it was the context for the project and why the project was important. She also “didn’t feel like there was anything being held back” about the risks involved. Some of the risks she felt were uncertain because they hadn’t reached that point in the project. For example, she mentioned not knowing the actual risks of lead in food grown at the site since nothing had been grown yet to be tested. She assumed the risk to children in homes with lead paint would be a lot higher than “being in a developed garden site where all your materials are separated by some kind of barrier.” Without a barrier to quarantine the contaminated soil she felt there would be a “more uncomfortable level of risk” and that the project shouldn’t move forward without one. Her only concerns regarding future risks were wondering if plants outside the remediation area would be tested for lead, as well as whether there would be further “testing done on the soil prior to people actually starting to grow food there.” Since Sally doesn’t live in the neighborhood she wasn’t “thinking that this is going to be a long term commitment for [her].” As a result she didn’t take any notes, which she felt would have helped her remember more information. She has thought about applying it to her own neighborhood, but admits her interest is mostly “intellectual curiosity.” She felt it was “highly likely” that there were other brownfields in the neighborhood, but didn’t think they would be brownfields for the same reason as Emerson Street Garden. She thinks the state and federal government need to provide support for cleaning up brownfields and that Portland should “adopt some kind of

property owner assistance to promote clean up of residential properties” since “property owners chose not to test” and “pass the contamination to the next owner.” Overall, Sally learned enough specifics about the project from the charrette to understand its importance, but because she wasn’t planning to stay involved, she didn’t try to remember any details. She understood the basic plan, and some of the remediation process, but was still concerned about risks from the operation of the completed garden.

In summary, compared to the brochure and flyer, participants were able to recall considerable amounts of information from the design charrettes. Most of the information retained by participants concerned the actual design, history, and plans for the project. Only a few recalled details of the clean up process, brownfields in general, or risks from lead specifically as they related to the Emerson Street Garden. The majority of participants, 8 of 13, said that the charrettes were their favorite activity and way to receive information. However, several expressed concerns about the staff-participants to neighbor-participants ratio, and whether the second charrette was necessary.

Motivation and Agenda. Interview and survey feedback from the participants was also examined to assess how personal motivations, prior agenda, and view of community impact retention and application of knowledge that result in a sustainable project. J. Falk et al (1998, 2002, 2010) found that gains in new knowledge for visitors at a science museum were significantly correlated to specific personal motivations and the intensity of the visitor’s prior agenda. To investigate whether personal motivations and agendas affected individuals involved with the Emerson Street Garden, participants were asked several questions about why they came to the charrette(s) and what interested and concerned them about the garden. This information was then compared to their

understanding of conditions at the site, brownfields and lead contamination, and their projected continued involvement in Emerson and similar projects.

For this study, personal motivations were grouped into five categories: community, education, place, affiliation, and recreation. When or if a motivation was expressed considerably more times than the rest, it was considered to be the primary motivation for that individual. The community category represented a wide variety of responses that involved improving the community. They included bringing people together, empowering the community, safety concerns (drugs, vandals, theft, homeless), or the demographics of the project area (people of color, low socio-economic district, and seniors/children). The education category represented motivations that centered around interest in technical or research aspects of the project (phytoremediation, brownfields, urban planning), and the desire to educate themselves, their children, and/or others about environmental sustainability and where food comes from. Place refers to whether an individual lived/worked in the neighborhood, had a personal connection to the neighborhood (used to live there/ family lives there), or had the desire to stay informed because of the proximity of the project site. Recreation refers to motivations involving experience or interest in gardening and social networking. Affiliation refers to individuals who were in the Emerson Working Group, or affiliated with a stakeholder organization. All of the participants expressed a combination of these motivations, notably all participants mentioned being motivated by community. An overall summary of responses for each motivational category drawn from both the survey and the interviews is shown in Figure 4.

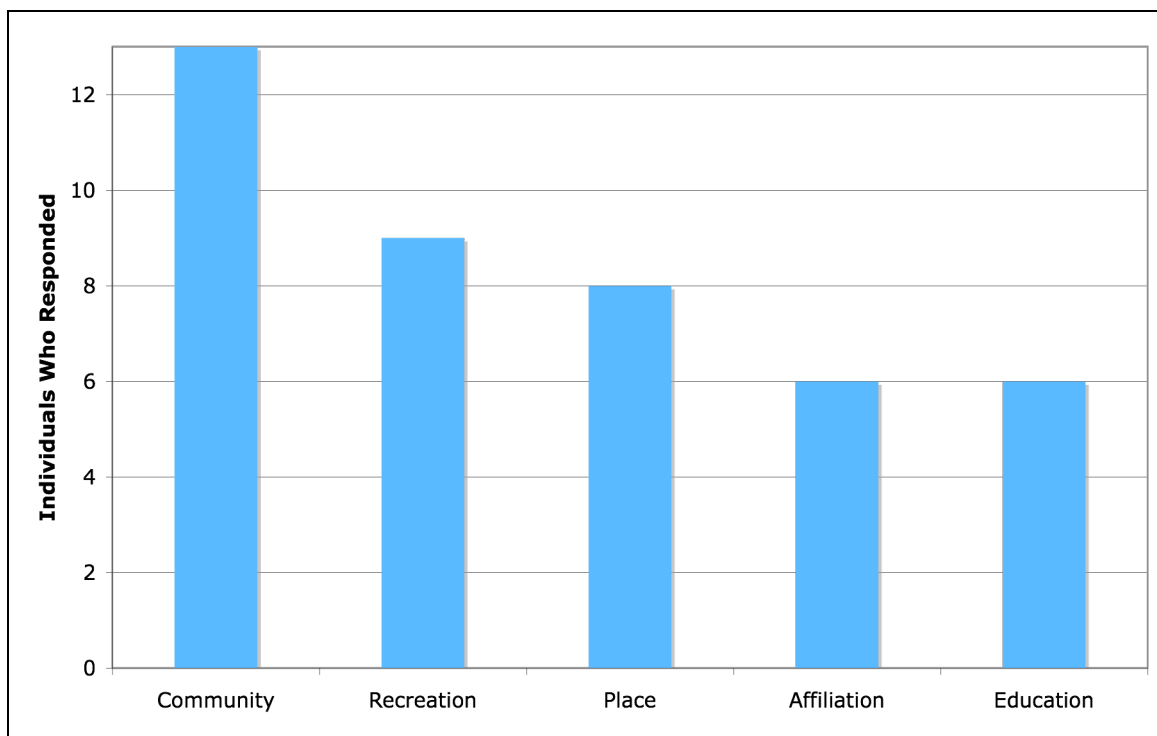


Figure 4: Responses for Each Motivational Category (n=13).

Prior agenda refers to the participants' purpose for attending the charrettes and was broken down into three categories: focused, moderately focused, and unfocused. An individual with a focused agenda had a specific goal or purpose for attending, such as to facilitate, because they were part of the EWG or affiliated organization, or to learn about a specific subject like phytoremediation. A moderately focused agenda refers to an individual who had an idea of what would happen at the charrette or plan for the project, but didn't have a specific purpose for attending. Finally, an individual with an unfocused agenda had no real idea of what the project entailed, and came to the charrette simply because someone they knew was going/invited them, or they saw a sign on the sidewalk the day of the meeting. An overall summary of the participants' prior agenda drawn from both the survey and the interviews is shown in Figure 5.

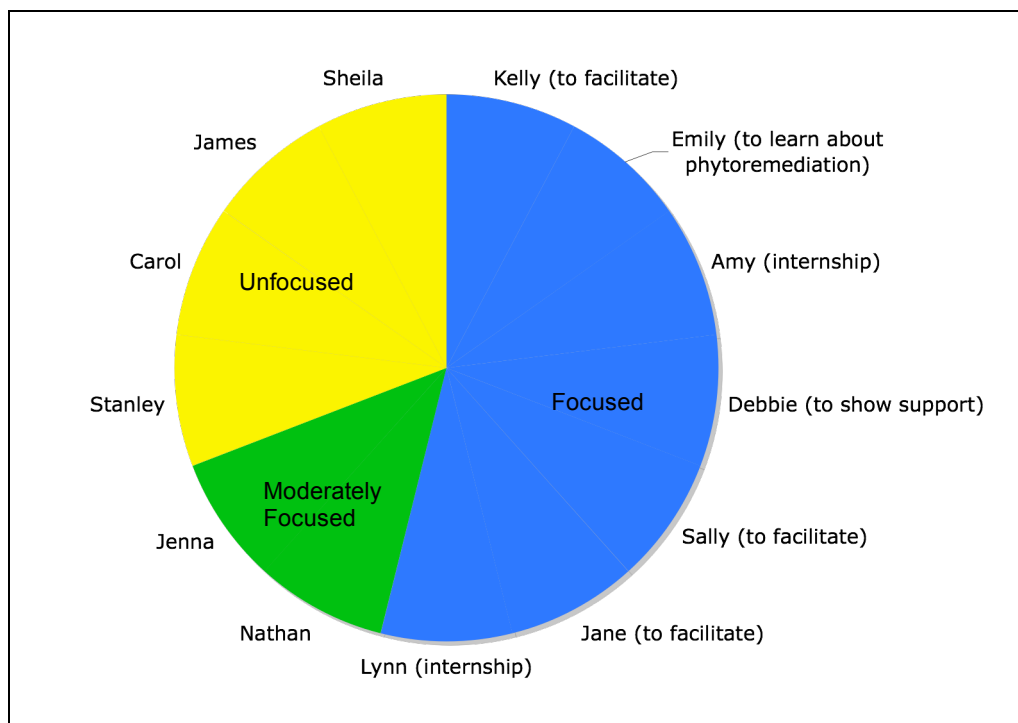


Figure 5: Participant's Level of Prior Agenda. For individuals with a focused prior agenda their purpose for attending is in parentheses.

Three individuals that represented the types of responses of the study participants' responses were James, Sheila, and Emily. Their experiences are detailed below.

James. James heard about the project from the door-knocking and was motivated to attend by a desire to improve the community and by recreation, because he was interested in gardening. James was impressed by “the enthusiasm of the door-knockers.” When describing the door-knocking, he explained there was a knock on his door and “two bright eyed and bushy tailed young ladies said, ‘Would you like to be involved in a community garden?’ The fact that they were committed to doing this, in itself was motivational.” While he didn’t have a focused agenda for coming to the charrettes, he attended both. James remembered a lot of the history of the site that was presented and

the long process the founders had to undergo to begin the project. “Slogging through 15 years of city and state regulations and approvals and financings . . . it was very inspirational, that we could do this for her, that we could make her dream come to pass.” James was very passionate about being committed to a cause and spoke a lot about racism and the history of the community. He understood the concept of lead contamination from the lead paint and wondered about other possible contaminants like asbestos and arsenic. He couldn’t remember the word phytoremediation and didn’t say anything about the clean up process or future risks. He also had a confused idea of brownfields, at one point comparing them to superfund sites later saying that a brownfield caused the dust bowl, and still later that it was a synonym for ghetto. When asked about his continued involvement, James said, “I talk a lot” and “can make people start thinking about stuff.” He wasn’t ready to commit to the Emerson Working Group because he wasn’t sure what direction the group would take or if the project would fade out, but said he was “willing to go along with it.” Unlike most of the other participants, James felt that the city and other government agencies are not “going to step in” and that “remediation for brownfields is a community affair.”

Sheila. Sheila was motivated by community, place, and recreation. She said she “wanted to participate and do something for the neighborhood.” She thinks “people should get involved in their community and see what they can do.” The project appealed to her because she lives within walking distance of the garden and can “go look at it.” She feels “this neighborhood is full of drugs and it is nice to see people doing, and getting together, in something positive.” Before the charrette she didn’t know anything about Emerson or brownfields. This is her first time gardening at her apartment. She “didn’t

think [she] wanted to do it, but [she's] really enjoyed it.” Sheila had a somewhat clear idea of what a brownfield was—she knew it had to do with contamination, and that lead was a concern—but she couldn't explain why Emerson was a brownfield. She was also confused because someone had told her lead “doesn't go to the plants.” She wanted to continue to be involved with the project and was willing to do anything. She didn't think she would get involved in any other brownfields because she didn't know enough about them. “I question everything and hopefully when I get enough information I can make the right decision, but if I don't have enough information see, I can't do it because I don't have the facts.” Sheila was considered to have an unfocused prior agenda because her attendance was motivated by general curiosity and a desire to meet some more neighbors rather than a specific interest in phytoremediation or desire to get involved in the project.

Emily. Emily was motivated primarily by education and community, with some influence from place because she lived in the neighborhood. She learned about the project through Groundwork and attended the first charrette because she was interested in learning more about phytoremediation. “[There are] a lot of brownfields in this city” and they aren't being cleaned enough; “I think it is still pretty toxic.” She had a focused agenda for coming to the charrette, first she wanted to learn more about phytoremediation, and second she had made some materials for the event and “just wanted to be present.” She said she “wanted to actually talk to [the project leader] more and see how they are going to use [phytoremediation] and find out more specifics about that.” She was not interested in the idea of the garden, and said, “if it was a regular Growing Gardens program or something else [she] probably wouldn't go because it's just gardening ... but this is more about brownfields and so it is a little bit richer for [her].”

Emily had worked with brownfields previously, and she had a high understanding of what a brownfield is and where they are normally found. As a result, she found it interesting that the Emerson Street Garden site was “in a residential area” rather than in a “commercial strip” or “industrial site.” She understood that while “no one is walking around eating soil” there was still some risk to the community if the site was not cleaned up. Like many of the others, Emily also felt that the government needed to take some responsibility for brownfields because while personal responsibility would be nice, the owners can be hard to find.

In summary, all the participants were motivated by community, even if it wasn't their primary motivation. One interesting outcome was that the combination of a primarily community motivation and an unfocused agenda appeared to correspond with a relatively poor overall understanding of the three subjects: the Emerson Garden project, brownfields, and risks from lead (Stanley, Sheila, James), see Table 4. Only four participants (Jane, Sally, Kelly, and Nathan) had a high overall understanding of the three areas. Their understanding was impacted by the length of involvement as well as previous education and experience.

Table 4:

Summary of Interview Participants' Motivations, Agenda, and Understanding.

Participant	Motivations	Agenda	Understanding
Jane	Community Place* Recreation*	Focused	Emerson – High Brownfields- High Risks from Lead – Good
Stanley	Community Place	Unfocused	Emerson – Poor Brownfields – Poor Risks from Lead – NA

Sally	Community* Education	Focused	Emerson – High Brownfields – High Risks from Lead – High
Emily	Community* Place Education*	Focused	Emerson – Good Brownfields – High Risks from Lead – NA
Kelly	Community* Place Affiliation	Focused	Emerson – High Brownfields – High Risks from Lead – NA
James	Community* Place Recreation	Unfocused	Emerson – Poor Brownfields – Poor Risks from Lead – Poor
Nathan	Community Place Education Recreation	Moderately Focused	Emerson – Good Brownfields – High Risks from Lead – High
Sheila	Community Place Recreation	Unfocused	Emerson – Good Brownfields – Poor Risks from Lead – Poor

* The primary motivation if identified.

Working Group

Shared Values. In his research concerning learning in community and sustainability I. Falk (1997) identified shared values as a critical piece for successfully achieving goals when working with a community or team. This study questioned how shared values developed or did not develop among the Emerson Street Garden working group (EWG) and the implications for future inclusion of local schools and kids clubs. Participants were surveyed and interviewed regarding their opinions on the value of the garden for a variety of uses including academic education, community education, community gatherings, and greenspace. Feedback from the design charrettes, surveys, and interviews was analyzed to explore how the values of the participants on the EWG developed and interacted.

In order to understand the different value sets initially held by the community, the design charrette participants were asked about their vision for the garden. Several goals for the Emerson Street Garden project were identified from the responses given by the table groups. The goals included growing food, education, networking, community space/improvement, and a place to showcase the history of the neighborhood. A summary of the feedback from the charrette can be found in Table 5.

Table 5:

Summary of Feedback from Charettes about Community Vision for the Garden

Theme	Responses
Education	Education: Learning garden for kids from neighborhood schools
	Multi-sensory
	Visually impaired, tactile
	Multi-use (sensory garden/play)
	Hold Classes
	Teach people aspects of gardening, soil knowledge, etc
History of Project and Neighborhood	Honoring the historic community and the development of Emerson Garden
	History sharing (can be part of story sharing)
	Interpretive panels so people know the history of the garden
	History of garden now and the brownfield
	To add to honoring the neighborhood
	Document where we started, before and during pictures
	Naming of garden to reflect history
	History of King
Community involved in creating the history/story, do them periodically, original owners	
	Before and after pictures
Community Space/ Improvement	Art
	Little stage
	Tool Library on site
	Community/Public Art
	Protect health of people and environment
	Full grown, beautiful if it is maintained and taken care of properly
	Popular place, adults and kids in neighborhood and community hang out having a good time
	Annual gathering and celebration
	Temporary portable tent during harvest time and other gatherings
	Senior community would frequent to visit and can work on waist high raised beds
	(Community security - Weekly volunteers checking early and late and on rotation so it is constant)
	Story telling and signing (ASL) around the fire pit, dance, music, art and puppet shows ongoing and annual

Growing Food	Update garden every 3 years or so according to industry standard (going greener)
	Sharing a percentage of produce with community especially multi-unit residents that have less or no access.
	Utilize website to garden organizing watering, general upkeep, etc. People could provide their input.
	Organic Only gardening
	No GMO! [Genetically Modified Organisms]
	Attract Bees
	Pollinator attractor
<hr/>	
Networking	Food: Connected to King Farmers' Market, give away excess food at King Farmers market.
	Seed Library
	Connection to Tool Library
	Link to Growing Gardens Website
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	Corporate sponsorship to keep consistent funds for garden
	Connecting with other community gardens within a 1-mile radius to do collaborative work/events and cooperative exchange
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After the design charrettes, the Emerson Street Garden working group (EWG) was developed to take charge of creating policies and procedures for the garden, reaching out to the community, and planning for future use and programs at the garden. The membership in the EWG fluctuated over the following year, adding new members and losing some. To gain a deeper understanding of how shared values and personal motivations shaped the EWG and its vision, a survey was conducted one year after the implementation of the design charrettes. Eight EWG members participated in the follow up survey. The survey had two purposes for assessing shared values. First, it examined the motivations of EWG members to re-assess the vision and values expressed during the charrettes. Second it focused on how highly the EWG members prioritized education, and their opinion regarding the recipients and content of educational programs in the garden.

The motivations expressed by the EWG were community, place, education and recreation. Contrary to the charrette surveys and interviews at the beginning of the project, none of the follow up survey participants expressed being motivated by

affiliation, although Susan did mention she would like her participation in the garden to be part of her professional portfolio. Also, although one participant did not mention community as a motivation for his/her involvement, community remained a primary motivation. A second motivation tied with community for most influential. Place was also identified by seven of the eight participants, followed by education that was mentioned by three participants. The least common motivator was recreation. This was surprising since it is a garden project and recreation was the second most common motivation according to the original survey and interviews. A summary of participant motivations is shown in Table 6.

Table 6:

Summary of Participants' Motivations from Follow-up Survey.

Participant Alias	Motivations Expressed
Carol	place
Susan	community, education, and recreation
Linda	community and place
John	community, place, and education
Stanley	community and place
Sheila	community and place
Robert	community and place
Nathan	community, place, and education

The evolution of each participant's motivations and values over the year was varied. Feedback from survey responses and interviews with Jane and Stanley display the diversity of experiences resulting from personal values and motivations over the year since the design charrette.

Jane. Jane was an original member of the working group whose main priority was gardening. When asked about her plans for future involvement Jane replied, “I’ve gone back and forth, but yeah I’ve signed on and gardening is my passion.” During her interview she repeatedly expressed frustration with the lack of neighborhood participation at one point saying, “I wrack my brains on how to get the neighbors to sign on, but what you see is what you get. You can lead a horse to water but you can’t make it drink.” However, once more neighbors began to participate, she struggled to assimilate the other visions for the garden. She felt many of the brainstorming ideas that grew out of the design charrettes were outlandish and unrealistic, and that not everyone was willing to admit the reality of the situation including drugs, homelessness, and racial tensions. While she mentioned wanting to improve the community, she did not want simply a park or community gatherings space, and felt that such a space would only encourage vagrants and drug dealers to use the space. She also said: “I find it a little frustrating because there is always an underlying agenda that is political” and that she was offended by the use of the phrase “people of color” on the flyer. She felt “that ‘neighbors’ would have been adequate.” She “felt that it was selfish to target a specific race and [that she] likes to think we are all neighbors and we are all welcome” and that the phrase was a political buzz word just used for politicians. In the end, Jane was unable to resolve her growing personal concerns and frustrations and dropped out of the project. Jane did not participate in the follow up survey.

Stanley. Stanley grew up in the neighborhood and although he no longer lives there himself, he still has relatives in the area and feels a strong connection to the place. Unlike Jane, Stanley is not a gardener, nor is he interested in the day-to-day workings of

the garden. When asked why he was involved he said, “I became involved in the garden as a way to give back to the community. I saw some of the blight in urban areas and I never really liked what I saw: excess garbage, old tires, little kids playing in those areas. All of these situations made me think that something should be done...I think that to me it is an exercise in power, especially the city government...but it’s also a chance to see how common people can react with that power, especially in connection to their neighborhood.” Stanley remembers growing up during the period of the urban renewal projects in the 1960s and 70’s and recalled that “while they had some problems, it was a pretty good area.” He sees the historical Union Avenue Redevelopment project as a “plan to destroy the neighborhood . . . and drive out businesses.” Because of his view of previous projects he plans to stay involved in a support role and wants to be sure this one is done differently so that it actually improves the neighborhood.

Education was one of the original uses envisioned by the community participants, even though only a few of the participants were personally motivated by education. EWG members were surveyed to get a better understanding of their opinions about education. All the participants placed education near the top of the priority list. John and Stanley were the only participants who specified what goal should have a higher priority. John felt education should be “second or third on a list of priorities that would also include community development and environmental restoration”. Stanley said he “would put education right behind upkeep. If the project is not kept up, then education becomes mute”. A summary of the participants’ responses regarding how to prioritize education is shown in Table 7.

Table 7:

Summary of Participant Prioritization of Education at the Garden.

Participant Alias	How would you prioritize education?
Carol	high
Susan	pretty high
Linda	first or second
John	second or third
Stanley	second
Sheila	first
Robert	top
Nathan	at the top

Participants were also asked about their opinions regarding the content, recipients, and facilitators for educational programs at the garden. Gardening, environmental issues, and community building were each mentioned by three different participants.

Brownfields, ecology, and “anything” were suggested by two participants each.

Participants also thought the garden would provide an opportunity to teach philosophy and health/nutrition. A summary of participant responses is shown in Table 8. There was also a variety of response for who should be taught at the garden. Five participants felt that children should be the recipients. Three of those five only mentioned children. Other participants felt anyone should be allowed to learn at the garden or specified members of the community. Only Stanley mentioned that the garden should be used to teach those outside the community. He felt the community should be first “then neighborhood developers, then possibly school groups.” It is interesting to note that both individuals who said anything should be taught also felt anyone should be taught. Four participants mentioned experts should be responsible for teaching at the garden, similarly, four

participants also felt that the community should be responsible for facilitating the educational programs. Three participants said the schools should be responsible for the programs. Again, two participants felt that anyone should be allowed to teach. Only Stanley mentioned responsibility being at the municipal level.

Table 8:

Summary of Participant Views Regarding Content, Recipients, and Facilitators.

Participant Alias	What should be taught?	Who should be taught?	Who should facilitate/teach?
Carol	environmental issues	children	experts
Susan	gardening brownfields environmental issues health/nutrition	everyone, focus on youth	experts first and eventually previous recipients
Linda	anything	anyone	community members
John	philosophy gardening ecology community building	children, community	school teachers, experts, anyone
Stanley	brownfields community building	community, neighborhood developers, school groups	schools, the city, community
Sheila	community building	children	experts
Robert	anything	anyone	anyone
Nathan	gardening ecology environmental issues	children	community and local schools

In summary I. Falk (1997) suggested the shared value-set could influence learning outcomes for teams/communities. The participants shared many of the same motivations for being involved in the Emerson Street Garden project. Community and Place were

both mentioned by all but one or two participants as reasons they were involved. It was also important to notice how diverse values appeared to impact continued involvement. Jane and Stanley both said they were motivated by community and place, but Jane was unable to adapt as the project vision expanded to include other neighbor's ideas. Jane was mainly connected to the project through the gardening vision, while Stanley was not set on any one vision as long as the outcome improved the community. None of the current working group said that their motivations had changed, but they still prioritized education even if it was not a motivation for their personal involvement. However, when asked how they would rank education on a list of priorities, all the participants placed it at or near the top. They also felt that the community should be the main recipient of educational opportunities, specifically children and youth, and that schools as well as community members should play a role in teaching not just experts.

Distribution of Knowledge. A second critical piece for successfully achieving goals when working with a community or team from the work of I. Falk (1997) was even distribution of knowledge. According to I. Falk (1997), a second critical element for achieving goals when working with a community was the even distribution of knowledge. The current study investigated whether the Emerson Working Group was successful in distributing knowledge among its members. To answer this, the follow up survey participants were asked about their understanding of risks and conditions at the Emerson Garden site now versus one year ago. They were asked to rate their own understanding using the scale shown in Figure 6. All eight of the participants rated their understanding of the conditions and risks at the Emerson Street Garden site to be a 3 or higher, while six of the eight participants rated their understanding at a level of 5 or

higher. A rating of a 5: Medium-High was the most common self-selected rating, and differs from 3 and 4 by having not only a grasp of some details, but also the confidence that they could explain it to someone else.

- 1 (No idea, I just guessed)
- 2 (Low, sounds familiar, but I'm not certain)
- 3 (Med-Low, I think I understand the ideas, but not the details)
- 4 (Medium, I understand, but I couldn't explain it to someone else)
- 5 (Med-High, I could explain it briefly to someone else)
- 6 (High, I could explain it in detail to someone else)
- 7 (I'm an expert)

Figure 6: Rating scale for level of understanding from 1-year follow up survey.

Three participants (Nathan, Sheila, and Susan) reported no change in their understanding from one year prior. Robert and Carol said that they had moved from a medium low understanding to a medium high understanding. Stanley had the highest jump in understanding from a level 1(No Idea), to a level 5. John increased one level from a 4 to a 5, and Linda had the lowest current rating but increased from a 1 to a 3 over the year's time. Linda had only recently joined the working group. A summary of participant understanding is shown in Figure 7.

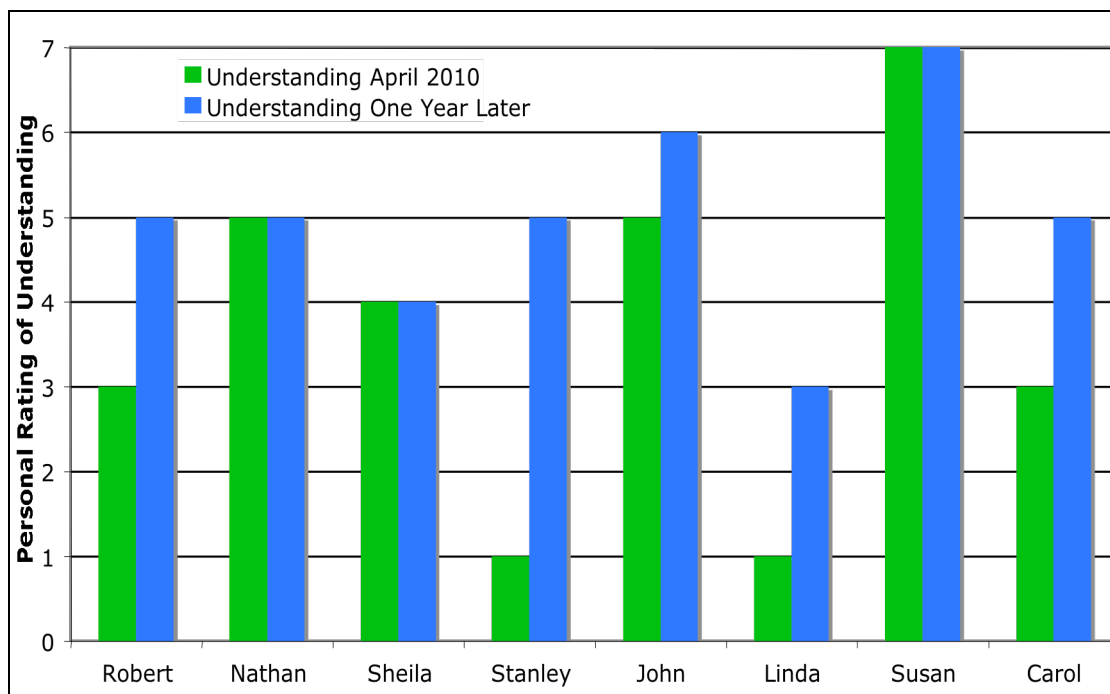


Figure 7: Changes in working group members' level of understanding over one year.

In summary, the Emerson Street Garden working group had been successful at encouraging all their members to learn more about the project, risks, and conditions and had a medium-high average for their self-selected level of understanding. Regardless of their self-rated understanding, all but one participant recalled that the site was contaminated and needed treatment, and six specifically mentioned lead. Only Susan considered herself to be an expert. Susan is also the original founder of the Emerson Street Garden and the acting Project Manager.

Chapter 5: Conclusions and Implications

The purpose of this study was to explore the complexities of creating a community garden on a residential brownfield in a low-income community with a large minority population. In order to better understand how a community-based project like Emerson evolves, feedback from 17 participants was used to investigate how the project impacted individuals from the community including: who chose to participate, what motivated individuals to become involved and remain committed, and how the individual's understanding of the project's risks and plans change throughout his/her involvement. Along the way, several important ideas emerged including reactions to several questions raised from the literature.

Conclusions

Low-income and minority communities host the majority of brownfields in the USA (Herbele & Wernstadt, 2006; Gallagher & Jackson, 2008). Gallagher and Jackson (2008) showed clearly that community involvement can be an asset or an obstacle to redevelopment of brownfields. In particular, to be successful, project managers need to go beyond formal meetings and hearings because activities like public record notices, and public hearings require community members to locate the opportunities themselves and assume that they would know where to look for them. Evidence from the study supported this claim. During this study many participants said that they were drawn to the project by face-to-face communication with a neighbor, friend, or project representative. In contrast, very few participants actually took time to read any of the written materials. The study results also support the idea that one size does not fit all when it comes to strategies of engagement, especially print media. Participants held directly opposite viewpoints

when it came to preferences and what attracted them to the flyers. Nathan for example, was drawn to the black and white, home-grown feel of the flyer he received, where as Sally said the color flyer caught her attention because it looked professional. While it may be tempting to make one version of a flyer and only mail information or put an insert in a newspaper, findings from this study suggest that taking the time to create a variety of materials and talk to people face-to-face can have big pay offs when it comes to engaging the community.

The category of free-choice learning represents a wide range of learning environments. Studying individuals visiting a science museum or participating in a community garden already pre-selects certain motivations and characteristics. While some of the motivational categories identified in this study were also expressed by visitors to the science museum (J. Falk et al., 1998), there was minimal overlap and no evidence to support a connection between learning gains and any specific personal motivations as observed by Falk. While these results might have been different had more individuals participated, this study found that there was a spectrum of learning gains even though individuals participating in the Emerson Street Garden project expressed similar combinations of motivations and some motivations were expressed by most if not all of the participants. This lack of connection may be due to the variation in purpose; the express purpose of the design charrettes being to increase engagement in the EWG and its programs. J. Falk et al. also found a connection between an individual's level of focus for their visit to the museum and the size of learning gains. As with personal motivations, this study found no data to support the connection between the level of focus and higher learning gains that was observed by J. Falk. Due to the diverse nature of free-choice

learning programs, conclusions from one environment cannot necessarily be directly applied to another free-choice learning environment. More research is needed in order to begin to identify commonalities and best practices in these highly varied learning environments.

This study also explored the impact of shared values on the working group membership. Shared values and the ability to assimilate new ideas in order to make a vision that comes from all the members was an important factor in continued involvement. One individual who was passionate about the idea of gardening was not able to assimilate the community improvement vision of other neighbors and after several conflicts chose to no longer participate in the project. This individual's experience perhaps points to the need to spend time building a set of shared values among the Emerson Working Group members.

I. Falk (1997) suggested several important characteristics of knowledge found in successful and sustainable projects/communities. These included the dissemination of knowledge throughout the team, not held by one individual, and that knowledge should be holistic rather than focus on a single area of specialization. The Emerson Working Group has been successful at encouraging all their members to learn more about the project, risks, and conditions and had a medium-high average for their self-selected level of understanding.

Recommendations

Future Research and Programming. Feedback from this case study has raised several questions that require further research. First, although the project took place in a diverse community, there was minimal involvement by minorities, and no involvement

by non-English speaking residents. In order to be successful at including and educating the entire community, additional outreach efforts need to be considered and further research is needed concerning to determine the effectiveness of these methods for engaging the minority community in both the Emerson Street Garden Project and in future research studies.

A conclusion from this case study was that one size does not fit all when it comes to educating and improving awareness in a community setting. However, the feedback did show that participants shared many of the same motivations. More research is needed to see if designing materials and activities around common motivations would increase participation and lead to the development of shared values necessary for ongoing involvement and participation. Since the mission of the project is to include all members of the community it will be important to assess whether or not this goal is met, or whether the project only reaches a specific profile of individual. A similar goal of the Emerson Street Garden Project is to increase awareness and understanding of brownfields, especially in residential areas. It will be important to assess if the project has been able to increase to overall awareness of brownfields for the whole community or only for those community members directly involved in the project.

Many free-choice learning activities rely on similar one-time workshops or activities. An important question raised from this study is: How can we encourage retention of information from one-time events like the charrettes? A set of best practices for one-time outreach events would be valuable to many community development projects but should never take the place of long-term projects with multiple outreach events. Perhaps more importantly, the question of how to increase and encourage ongoing

participation is an important question for Emerson as well as most grassroots, community-based programs and project. Findings from this study, in alignment with I. Falk (1997) suggest that the development of shared values among the organizational membership might be a critical component.

Methodology. Several important ideas emerged from this case study in regards to methodology. First, because of the hesitancy of the community to trust outsiders it was vital that the researcher gain their trust. It is the opinion of the researcher that much of the information gained from the interviews would have been lost if the participants had not considered her a friend. To be considered a friend the participants had to know her, to share experiences with her at the design forums, working group meetings, and through other activities. She had to prove that she was interested in their lives, not just their involvement in her research. It is critical not to underestimate the power and importance of just spending time with people. Second, in-depth surveys take time, and a much greater response rate occurred when the survey was provided online.

Limitations

There were two main limitations that arose during this study. The first limitation was that the methodology chosen did not allow for adequate analysis of learning gains by the participants during individual activities. One surprise was the unexpected lack of details provided by the survey and interview participants. This lack of detail made it difficult to evaluate the true knowledge gains and in some cases, to separate them from prior knowledge. The initial survey was designed to draw out pre/post style information by asking participants to identify what they knew before or learned at the meeting, but future studies will need to be even more specific while still trying to avoid feeling like the

participants are taking a test. A possible solution would be to adapt the Personal Mean Mapping (PMM) methodology used by J. Falk et al. (1998) in their museum studies. This methodology was developed to address the flaw in traditional methods that assume all participants begin with a comparable level of knowledge. Instead the PMM “is designed to measure how a specified educational experience uniquely affects each individual’s personal conceptual, attitudinal, and emotional understanding” (J. Falk et al, p. 108). PMM methodology was not chosen for this study because it requires a pre and post-test or interview and targets a one-time learning event. The PMM methodology also requires considerable time commitment from the participants. Unlike J. Falk’s large population of museum visitors, community projects like the Emerson Street Garden have a limited population to draw from and as a result require participation from a greater percentage of the target population. Due to the length and setting of the design charrettes, it was concluded that a greater number of participants would agree to a single post assessment than to a more time intensive pre/post method. This leads to the second major limitation, the small sample size. Limited involvement, especially from those representing the minority groups within the community, restricted the researcher from drawing many definitive conclusions. A shorter post-survey may also have encouraged greater participation. Nonetheless, this case study, provided a snapshot of 17 participants’ experiences in one project and taken together, these stories provide useful information for the ongoing development of the Emerson Street Garden, as well as insights for future research.

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APPENDIX A: Survey Instruments

A-1: Post Charrette Survey with Cover Letter/Informed Consent Form

Using Brownfields to Think Green: Impact of Educational Outreach Components on Environmental Problem-Solving Capacity

Dear Potential Participant:

My name is Charissa Stair, and I am a graduate student at the Center for Science Education at Portland State University. I am conducting a study how well educational outreach components of the Emerson Street Garden Project inform and motivate the recipients to be involved in environmental problem solving activities, and I would like to invite you to participate.

You are being asked to participate because you attended the Emerson Street Garden design forum. As part of the study, I am interested in your opinions and attitudes about the recent educational outreach in your neighborhood, and hope that the information I collect will help us to better understand how to inform and motivate neighbors during restoration projects. If you decide to participate, you will be asked to complete a written survey, which involves answering questions about your knowledge of the Emerson Street Garden Project, understanding of risks, intent to act, and opinions about outreach materials. It should take approximately 10 minutes to complete.

You may not receive any direct benefit from taking part in this study, but the study may help to increase knowledge that may help others in the future.

Any information that is obtained in connection with this study and that can be linked to you or identify you will be kept confidential by removing all names and contact information before the survey data is entered into a computer database. Your participation is voluntary. You do not have to take participate in this study and you may withdraw from this study at any time without affecting your relationship with Portland State University, or the Emerson Street Garden Project.

If you have concerns about your participation in this study or your rights as a research subject, please contact the Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 600 Unitus Bldg. Portland State University, (503) 725-4288 / 1-877-480-4400. If you have questions about the study itself, contact Charissa Stair at (503) 557-8323 or through the Center for Science Education at Portland State University.

Your signature indicates that you have read and understand the above information and agree to take part in this study. Please understand that you may withdraw your consent at any time without penalty, and that, by signing, you are not waiving legal claims, rights, or remedies. The researcher will provide you with a copy of this form for your own records.

Signature

Date

If you are under 18, Parent or Guardian consent is required for your participation in this study.

Signature of Parent or Guardian

Date

Part 1: Information about You

1.1 What is your age? _____

1.2 What is your gender? _____

1.3 What best describes you?

- White/Caucasian Black/African American
 Hispanic/Latino Asian
 Native American/Alaskan/Native Islander
 Other: _____

1.4 How long have you lived in the neighborhood?

- Less than 1 year 1-3 years 3-5 years
 5-10 years More than 10 years: _____
 I do not live in the neighborhood.

1.5 What best describes your home?

- Apartment House Other: _____

1.6 What is the highest education have you completed?

- Some High School High School Diploma
 Some College or Trade School Trade License
 College Degree Some Graduate School Graduate Degree

1.6 Do you/ have you ever grown your own food?

- Never have/ Not Interested
 Never have/ Interested
 Did/ Do not now
 Do currently

Part 2: Information about the Emerson Street Garden Project

2.1 What do you know about the Emerson Street Garden Project?

2.2 Why did you come today?

2.3 What are your interests in the garden?

2.4 Do you have any concerns about the garden?

2.5 Who will you talk to/ What will you do about your concerns?

2.6 What do you know about Brownfields?

- Knew Before
- Learned Today

2.7 What do you know about Lead in soils?

- Knew Before
- Learned Today

2.8 Would you like to continue to be involved in the Emerson Street Garden Project? If yes, How?

Part 3: Outreach Activities

3.1 Where did you receive information about the Emerson Street Garden Project? *(Check all that apply)*

- | | |
|--|--|
| <input type="checkbox"/> Flyer | <input type="checkbox"/> Tri-fold Brochure |
| <input type="checkbox"/> Word of Mouth | <input type="checkbox"/> Project Representative at _____ |
| <input type="checkbox"/> Cable Access | <input type="checkbox"/> Website |
| <input type="checkbox"/> Design Forum | <input type="checkbox"/> Newspaper: _____ |
| <input type="checkbox"/> Other: _____ | |

3.2 Which activity was **most** appealing to you?

- Flyer
- Project Representative
- Website
- Last Month's Meeting
- Tri-fold Brochure
- Cable Access
- Newspaper
- Tonight's Meeting

3.3 What did you **like** about it?

3.2 Which activity was **least** appealing to you?

- Flyer
- Word of Mouth
- Cable Access
- Tonight's Meeting
- Tri-fold Brochure
- Project Representative
- Website
- Newspaper

3.3 What did you **not like** about it?

3.3 How informative was each activity? *(Please circle the number that best represents each activity. 1= To much information and 6= Not enough information)*

	<i>To Much</i>				<i>Not enough</i>	
	1	2	3	4	5	6
Flyer	1	2	3	4	5	6
Tri-fold Brochure	1	2	3	4	5	6
Project Representative	1	2	3	4	5	6
Cable Access	1	2	3	4	5	6
Website	1	2	3	4	5	6
Tonight's Meeting	1	2	3	4	5	6
Newspaper	1	2	3	4	5	6

Part 4: Opportunity for More Involvement in this Study

I would like to thank you for participating in the written survey portion of this study, and invite you to participate in an interview to discuss your answers, more opinions, and suggestions for future projects. Several options for interviews are available:

- You can be interviewed as an individual.
- If you came to the study with your family, you can be interviewed with them as a group.
- If you are 65 or older, you can be interviewed with a focus group of your peers.
- If you are under 18, with parental permission you can be interviewed with a focus group of your peers.

If you are interested in participating in any of the interview options, please provide me with your name and contact information. I will contact you this week to explain the process and set up an interview time.

Name

Phone Number

Email or Street Address

A-2: Interview Guide with Informed Consent Form

Using Brownfields to Think Green: Impact of Educational Outreach Components on Environmental Problem-Solving Capacity

Dear Participant,

You are invited to participate in a research study conducted by Charissa Stair, a graduate student from the Center for Science Education at Portland State University. The researcher is investigating the outcome of outreach activities from the Emerson Street Garden project. You were selected as a possible participant in this study because you attended an Emerson Street Garden design forum.

If you decide to participate, you will be interviewed to assess your current understanding of information related to the Emerson Street Garden project and your opinions about the outreach activities. While participating in this study, it is possible that you may encounter minimal risks associated with travel in your neighborhood. In order to maintain confidentiality, if this is a group interview we ask that you not repeat any names or opinions expressed by other individuals. You may not receive any direct benefit from taking part in this study, but the study may help to increase knowledge which may help others in the future. Furthermore, we hope that this will increase your understanding of environmental projects in our local community.

Any information that is obtained in connection with this survey and that can be linked to you or identify you will be kept confidential. This information will be kept confidential by coding responses to remove names and contact information before entering the survey information into a database. Your participation is voluntary. You do not have to take participate in this study and you may withdraw from this study at any time without affecting your relationship with Portland State University.

If you have concerns about your participation in this study or your rights as a research subject, please contact the Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 600 Unitus Bldg. Portland State University, (503) 725-4288 / 1-877-480-4400. If you have questions about the study itself, contact Charissa Stair at (503) 557-8323 or through the Center for Science Education

Your signature indicates that you have read and understand the above information and agree to take part in this study. Please understand that you may withdraw your consent at any time without penalty, and that, by signing, you are not waiving legal claims, rights, or remedies. The researcher will provide you with a copy of this form for your own records.

Signature _____ Date _____

If under 18, Parent or Guardian consent is also required.

Parent or Guardian Signature _____ Date _____

Interview guide for Using Brownfields to Think Green: Impact of Educational Outreach Components on Environmental Problem-Solving Capacity

Greet each potential participant.

Thank them for the opportunity to tell them more about the project and give them the informed consent form. Read the consent form aloud and summarize it for them. Then give the participant(s) time to ask any questions they have. When you have answered the questions, give each participant the opportunity to decline to participate. If they decline, thank them for their time and end the interview. If they agree to the interview, have them sign two copies of the consent form (one for you and one for their records) and thank them for being willing to participate. Remind them that the interview is voluntary and they can choose to stop at any time, or choose not to answer any question they do not feel comfortable with.

Outline for questions: Other questions may arise out of the conversation.

1. How long have you lived in the neighborhood?
2. How has it changed?
3. Do you have any concerns about your neighborhood (environmental, social, or health)?
4. Have you acted on your concerns?
5. The Emerson Garden site is considered a brownfield, what does that mean to you?
6. Where did you learn about brownfields?
7. Do you think there are other brownfields in your neighborhood?
8. Who do you think is responsible for cleaning up local brownfields?
9. Several educational components have been used to inform the neighborhood about the Emerson Garden Project, what do you remember seeing?
10. What made it memorable?
11. What did you like about the _____ component?
12. What didn't you like?
13. Was any component more useful for getting information?
14. Do you have any suggestions for making a better educational component?
15. What made you want to go to the design forum?
16. Did any of the activities help you decide whether or not to go?
17. If yes, what influence you?
18. What can you tell me about your experience at the forum?
19. How do you feel about the future of the Emerson Garden project?
20. Will you be involved?
21. If yes, why do you want to be involved?
22. If you were concerned about another property, or environmental issue, would you want to do anything?
23. If yes, what would you do and why?

Allow each participant to answer the question as completely as they choose. After the interview, thank them for their time.

A-3: 1-Year Follow Up Survey with Cover Letter/Informed Consent Form

Using Brownfields to Think Green: Impact of Educational Outreach Components on Environmental Problem-Solving Capacity

Dear Potential Participant

My name is Charissa Stair, and I am a graduate student at the Center for Science Education at Portland State University. I am conducting a study how well educational outreach components of the Emerson Street Garden Project inform and motivate the recipients to be involved in environmental problem solving activities, and I would like to invite you to participate. You are being asked to participate because you have attended the Emerson Street Garden working group or participated in previous activities with the study. As part of the study, I am interested in your opinions and attitudes about the Emerson Garden, and hope that the information I collect will help us to better understand how to educate and motivate neighbors during similar projects.

If you decide to participate, you will be asked to complete a written survey, which involves answering questions about your knowledge of the Emerson Street Garden Project, understanding of risks, motivation, and opinion about educational programs. It should take approximately 10 minutes to complete. You may not receive any direct benefit from taking part in this study, but the study may help to increase knowledge that may help others in the future.

Any information that is obtained in connection with this study and that can be linked to you or identify you will be kept confidential by removing all names and contact information before the survey data is entered into a computer database. Your participation is voluntary. You do not have to take participate in this study and you may withdraw from this study at any time without affecting your relationship with Portland State University, or the Emerson Street Garden Project.

If you have concerns about your participation in this study or your rights as a research subject, please contact the Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 600 Unitus Bldg. Portland State University, (503) 725-4288 / 1-877-480-4400. If you have questions about the study itself, contact Charissa Stair at (503) 557-8323 or through the Center for Science Education at Portland State University.

Your signature indicates that you have read and understand the above information and agree to take part in this study. Please understand that you may withdraw your consent at any time without penalty, and that, by signing, you are not waiving legal claims, rights, or remedies. The researcher will provide you with a copy of this form for your own records.

Signature and Date:

If you are under 18, Parent or Guardian consent is required for your participation in this study.
Signature of Parent or Guardian and Date:

Emerson Garden 1-Year Follow Up Survey:

1. Briefly explain why are you involved in the Emerson Garden?

2. Have your motivations changed since you became involved?

3. What are the environmental conditions at Emerson? Where did you learn about them?

4. True or False: There are risks to local residents if there is no remediation. If True, **Explain?**

5. True or False: There are risks to local residents from the remediation process. If True, **Explain?**

6. True or False: There are risks to local residents from operating the garden. If True, **Explain?**

7. Rate your current understanding of the conditions and risks at the Emerson Garden site.

- 1 (No idea, I just guessed)
- 2 (Low, sounds familiar, but I'm not certain)
- 3 (Med-Low, I think I understand the ideas, but not the details)
- 4 (Medium, I understand, but I couldn't explain it to someone else)
- 5 (Med-High, I could explain it briefly to someone else)
- 6 (High, I could explain it in detail to someone else)
- 7 (I'm an expert)

8. Rate your level of understanding one year ago of the conditions and risks at the Emerson Garden site.

- 1 (No idea, I just guessed)
- 2 (Low, sounds familiar, but I'm not certain)
- 3 (Med-Low, I think I understand the ideas, but not the details)
- 4 (Medium, I understand, but I couldn't explain it to someone else)
- 5 (Med-High, I could explain it briefly to someone else)
- 6 (High, I could explain it in detail to someone else)
- 7 (I'm an expert)

9. How has your understanding of brownfields changed? Where did you learn the most?

10. What do you think people should know about the Emerson Garden?

11. Do you think the Emerson Garden should be used for education?

12. Where would you put education on a list of priorities for the Emerson Garden? Who should the Garden focus on educating?

13. Who should the Emerson Garden focus on educating?

14. What should be taught?

15. Who should be responsible for the teaching?

APPENDIX B: Coding Guides

B-1: Post Charrette Surveys

1. The Forum/materials:

Purpose for attending:	Resident (5)	Non-resident (6)	Total (11)
community building	4	4	8
member of interested organization	0	3	3
to be informed about activities in the neighborhood	1	1	2
gardening	1	1	2
because I was invited	0	1	1

Quotes:

- To be active in a positive community event to get neighbors more involved
- Vacant lots are not good use for community especially in residential neighborhoods. Important for this space to become active ? Gathering space
- I am partnering with GWP to conduct my Americorps CAP project in conjunction with the Emerson St. Project.
- I'm a board member of Groundwork PDX
- Learn more about project history and future plans
- Support community. Have a love of gardening. I am part of working group.
- I came because I was invited by Cassie Cohen.
- I came because I am interested in things that bring the community together - for all of our benefit.
- I'm doing an internship with the Urban League of Portland, an organization involved with the project. I'm also a passionate gardener
- I favor inclusive planning processes, especially physical design ones. I have worked with older adults before and appreciate the attempt to include their voices.
- The garden is in my neighborhood.

How did you hear about the Emerson Garden?	Resident (5)	Non-resident (6)	Total (11)
Project Representative	2	2	4
Word of Mouth	1	3	4
Design Forum 1	1	1	2
Flyer	1	1	2
Sign at site	2	0	2
Email	0	2	2
Design Forum 2	0	1	1

Website: Groundwork	0	1	1
Through another organization	0	1	1
Tri-fold Brochure	0	0	0

What activity appealed to you the most?	Resident (5)	Non-resident (6)	Total (11)
Design Forum 1	2	2	4
Project Representative	2	0	2
Design Forum 2	0	2	2
Tri-fold Brochure	2	0	2
Word of Mouth	0	1	1
Flyer	0	1	1
Email	0	1	1
No answer	0	1	1

Quotes:

(Design Forum 1/2)

- It had a good presentation!
- Interactive component
- I enjoyed engaging with community members
- Interactive, inclusive
- its creative

(Word of Mouth)

- It was very personal
- It is welcoming to hear from people I know

(Project Representative)

- She was very personable/knowledgeable and invited me to join/help out with boy and Girls club visits and other activities

(Brochure)

- That the committee was really interested in my input and involvement.
- brochure was informative.

What activity was least appealing to you?	Resident (5)	Non-resident (6)	Total (11)
Project Representative	0	1	1
Flyer	1	0	1
Other: Time use at Design Forum	1	0	1
Website: Groundwork	1	1	2
No answer	1	5	6

Quotes:

(Website)

- I did not see a lot of Groundwork Portland finished or ongoing projects
- Not a lot of information or pictures of their projects

(Flyer)

-Could have been more descriptive

(Forums)

-Time shorter due to kids and other activities when we plan

-would have liked to connect more with other folks at the event-break up the tables

-have more people to do tables, small setting, have a hands on demo, local veggies, local fruit, floral arrangement

-did not feel another design forum was necessary

2. Continued interest/ Concerns

What are your interests in the garden?	Resident (5)	Non-resident (6)	Total (11)
community building	3	4	7
gardening/food	2	1	3
connect to nature	2	0	2
science of phytoremediation	0	1	1

Quotes:

- Having something nice that people will value and appreciate plus participate.
- Community action and building
- I would like to help get the garden started and to help improve the community.
- I'm interested in community directed land use and management.
- Science of phytoremediation.
- Getting it installed. Help with maintaining. Growing food number "1"
- I would like to see the neighborhood wuse the garden as a resource. A way to connect with past, present, and future. As well as get some food.
- Because is a good thing, seeing plants grow, seen the fruits of our work is a beautiful thing.
- Everything-I even like to weed!
- As a facilitator and champion of inclusive urban planning.
- to add to the neighborhood.

Concerns:	Resident (5)	Non-resident (6)	Total (11)
no concerns	2	1	3
who benefits	1	2	3
long term sustainability vs. fad	1	1	2
lack of community involvement	1	1	2
maintenance	0	1	1
contamination	0	1	1

Quotes:

- That it may not have long-term success could be fad or due to the green/sustainable
- that it serves people who don't have access to land, low-income, or other resources.
- I am concerned that not enough of the community is involved in the project.
- That it encourage social connecting and community empowerment. Not become another element of gentrification.
- The up keep, monies, participation by neighborhood who will be in change there has been little community interest/participation.
- My concerns are about vandalism and neglect. These types of things start out great but peter out kind of quickly without strong funding.
- no, can't wait until it starts
- The lead contamination - but think turning the land into clean space is fantastic.
- The questions of access needs to be addressed. I foresee potential conflict if those who participate now aren't able to access the asset in the future, or if those who didn't participate in planning process get access while others do not.

Continued Involvement	Resident (5)	Non-resident (6)	Total (11)
maintenance	3	1	4
any way/ yes, but don't know how	2	1	3
supportive/stay informed	1	1	2
planning	1	1	2
technical consulting	0	1	1
education	0	1	1
facilitating/ office work	0	1	1

Quotes:

- Grass root level - on going
- Support, do not like to garden
- Yes, I would like to keep volunteering and I would like to take on one aspect of the project
- Simple supportive through my role with Groundwork PDX
- continue providing technical consulting
- In any way needed, I am limited as for physical input
- Yes, I would like to be kept informed about other meetings and the "kick off" date of the gardens.
- How I don't know yet, but I am sure the is something the I be able to contribute.
- Education, gardening/garden maintenance
- Yes I am interested in that. Being a facilitator again, participating in event planning, doing office work, etc. . .

-Yes-perhaps volunteering or being involved in development decisions/plans

3. Knowledge gains

Knew about Brownfields before forum	Resident (5)	Non-resident (6)	Total (11)
contamination	1	2	3
can be found everywhere	0	1	1
concentrated in low-income communities	0	2	2
abandoned lots	0	2	2
none/ no answer	3	2	5

Quotes:

- Didn't talk about much.
- They are contaminated areas in need of cleaning/redevelopment. They are usually concentrated in low-income communities.
- They're everywhere . . . Often unknown and unaddressed
- Have worked on other BFs
- Vacant lots (abandoned) possible contaminated
- Absolutely nothing :-(
- Brownfields are urban sites that have contaminated soils (or perceived to be contaminated) that need to be removed or processed prior to redevelopment. Not all brownfields exceed EPA standards for contamination, simply testing to see if soils are contaminated can trigger an array of regulations and responsibilities that can intimidate property owners and reduce their interest in redevelopment. Many brown-fields offer opportunities for creative design and increased urban density as infill development projects.
- Only what I learned from the development meeting at the girls and boys club.

Knew about Lead in soils before forum	Resident (5)	Non-resident (6)	Total (11)
danger to kids	3	0	3
contamination in food/ if ingested	1	1	2
higher in industrial/urban areas	0	2	2
lead in soils	0	2	2
lead paint	0	1	1
no answer	1	0	1
other	1	0	1

Quotes:

- A little it sounds scary to some about food going in the school.
- Knew more about human contact in Lead and danger esp. w/kids

- Lead can get into soils through a variety of sources generally lead paint in cities. Lead is dangerous if ingested.
- It's a huge problem in Milwaukee, Wisconsin
- Have dealt with lead in soils at other sites - very common contamination.
- Not good, health hazard especially in early child development. Can be treated/removed.
- I know lead is higher in urban areas because of industrial pollution.
- a fair amount.

Learned about Lead in soils at forum	Resident (5)	Non-resident (6)	Total (11)
contribution from a house burning down	0	1	1
numerical data from Emerson site	0	1	1
EPA's acceptable levels	0	1	1
danger to children	0	1	1
leach into soils and absorbed by plants	0	1	1

Quotes:

- Never thought about the impact of a house burning down on lead contamination.
- Some of my knowledge is prior knowledge, but certainly all knowledge related to the amount of lead and the source of lead at Emerson Garden site is from the presentation event. Lead in soils can be dangerous to children, and it can leach into groundwater, as well as be absorbed by plants grown in lead contaminated soils. I was surprised at how high EPA's acceptable level was. It was interesting how varied the levels of contamination were throughout the site.

B-2: Interviews

Sample of Coding:

① Perspective on community

1. "only neighbor", "only immediate neighbor" - ? disappointed in her neighbor's lack of interest? (lonely/isolated?)
2. "no one was there to help as far as community, immediate neighbors" "It was just unfortunate that they didn't have more help." [Door knocking]
3. thought the spanish flyer "was necessary"
4. Frustration, tired, hopeless - "I wrack my brains on how to get the neighbors to sign on, but... you see what you get. You can lead a horse to water, but you can't make it drink." Her neighbors can't see what a great idea it is...
5. Community is stagnant, not together/connected
6. Disillusioned from past experiences with unsuccessful activities in the community.
7. Concerned about the garden becoming a place to loiter. "Vagrants" "We do have drug activity in this neighborhood" again, adds weight to her concerns by intimating it is shared by others. "It's ~~is~~ a pretty prevalent so that is a concern by a few of us. (thinks others are ignoring this concern)
8. Says "things can change ..." but doesn't sound certain, like she really believes it.
9. Current neighbors not interested in a community garden.
10. Heads in the sand regarding reality of drugs, homeless, and tensions

2) Personal Motivation

1. Proximity? "Immediate neighbor."
2. "I believe in community" - Wants to see a more "ideal community"
3. gardening - "I think [community gardens] are vitally important."
4. "gardening is my passion"
5. "I love people."
6. volunteer / invests her time because she believes growing food is an important movement.
7. This project is of interest because of proximity. "In my immediate yeah. It's in my... clutches there. I can get to it." (Difficulty with mobility)

3) Certainty of self / commitment to project

1. Took steps to find out more - website, phone call, attending...
2. Concerned about leadership, project future
3. "I've gone back and forth, but yeah I've signed on"
4. "Hoping [growing food] is not a fad"
5. Not interested in getting involved with another project, interest in this one because it is in her world.

4) Knowledge: Brownfields / Technical Info

1. Attempt to recall the formal definition given during presentation
2. Had heard the word before, but "didn't know what that really entailed."
3. Identifies brownfields with lots containing "debris and old buildings."

⑤ Forum Reflections (and other activities)

1. Door knocking: mostly recalled that the staff did all the work, she was the only neighbor.
2. Liked tri-fold best - more information, but "I think they both served a purpose."
3. Felt materials were adequate, lack of turnout/success blamed on stubborn attitudes of neighbors (choice-drink analogy)
4. Staff vs. neighbors - participation/attendance at forums
5. Budget concerns - over calculated participation, failure of staff to see the (to her obvious) lack of community interest. "ignored the... numbers"
6. "Over ~~the~~ world" - "a little confusing" "complex, complicated for just ordinary us everyday people signing on." "Not that we're dummies or anything it's just, you know..." Intimidated by personal lack of education (compared to staff).
7. "Again, staff did/were most the participants" "there wasn't enough of us to generate that... to make it work."
8. Poor planning of staff: sound in gymnasium "maybe research your places."
9. 2nd forum - space "big improvement"
10. Unsure about transparency of concerns: doubt about GW.Pdx - lack of info on ~~the~~ website, (needs to see it herself ^{to be sure})
11. Clear about process and goals, agrees with goal.
12. Still concerned about neighbor involvement.
13. Who will take charge? Who is in charge now?
14. Doesn't agree with the "parks environment" pitched by some other participants. (Tries to add weight to her concern by not being the sole opposition: "myself and others...") ~~really~~ concerned that the "garden will be hijacked and taken in a different direction"
15. Frustrated by a perceived underlying political agenda - lobbying for money.
16. Felt left out/insulted by the targeting of "people of color" on the flyers (again, drew ^{the} support of "we") politically motivated.
17. Talked to a staff member about #16. but felt they never really answered her.
18. sad that there aren't more neighbors
19. Current staff no longer connected to desire of current neighbors
20. Lack of research on attitudes of current neighborhood.
21. Seniors just there for the food.
22. 2nd forum: duplicate of #1, no progress made.

23. outlandish ideas, not kept to realistic options

APPENDIX C: Educational Tools

C-1: Flyer

Jardín Emerson Street

Queremos escuchar su voz

Por favor ayúdenos a crear una visión y diseño para el Jardín Emerson Street en 822 NE. Juntos, nosotros transformaremos este libre y contaminado lote en un vibrante, limpio y verde espacio comunitario

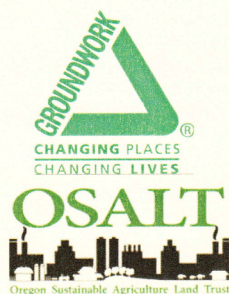


Por favor acompáñenos a dos venideros, foros comunitarios para el diseño del jardín

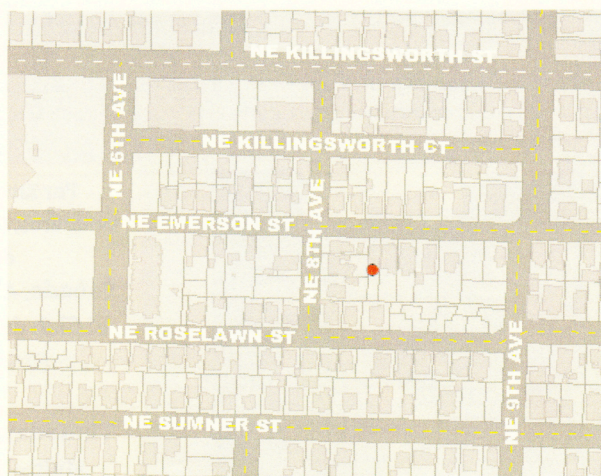
Sabado, Abril 17 - 1:00-4:00 pm
El Club de Blazer's Niños y Niñas
5250 NE MLK Jr. Blvd.

Thursday, May 6 - 6:00-8:30 pm
Multi-Cultural Senior Center
5325 NE MLK Jr. Blvd.

A participar en el foros comunitarios, por favor contacto Cassie Cohen de Groundwork Portland a (503) 662-2590 o cassie@groundworkportland.org.



el Jardín Emerson Street es 822 NE Emerson St., 4 cuadras al este de la MLK, 2cuadras al sur de Killingsworth y 4 cuadras al norte de Alberta



ANOTAR: Jardín Emerson Ceremonia para las familias y la comunidad —
June 26th - 1:00 pm en 822 NE Emerson

Emerson Street Garden—Brownfield to Greenfield

We want your voice to be heard

Please help create a vision and site design for the Emerson Street Garden ...
Together, we will transform this vacant lot/brownfield site into a vibrant, clean & green space.



PLEASE JOIN US FOR EITHER OR
BOTH UPCOMING DESIGN FORUMS

Saturday, April 17; 1:00-4:00 p.m.
Blazer's Boys & Girls Club
5250 NE MLK Jr. Blvd.

Thursday, May 6; 6:00-8:30 p.m.
Multi-Cultural Senior Center
5325 NE MLK Jr. Blvd.



The Emerson Street Garden is Located
approximately:
4 blocks east of MLK Jr. Blvd;
2 blocks south of Killingsworth Ave. and
4 blocks north of Alberta



SAVE THE DATE: Emerson Street Garden Groundbreaking Ceremony—
June 26; 1:00 p.m. at the site

C-2: Brochure

..... The Soil



In 1995, neighbors of 822 NE Emerson started talking about turning the vacant lot into a community garden where they could gather together, grow food, and teach their kids about gardening.

Fourteen years later, in October 2008, Multnomah County donated the empty lot to Oregon Sustainable Agriculture Land Trust (OSALT), making that dream one step closer to reality.

OSALT will make sure that the garden is protected for use by future generations of neighbors. Groundwork Portland and the neighbors will work together to make sure there's something worth protecting.

Emerson Street Garden

822 NE Emerson St.



Groundwork PORTLAND

in a community-based nonprofit that believes everyone has a right to a livable community, with shared spaces that bring the community together, produce food, beautify the neighborhood, provide family-wage jobs, and serve as an educational tool to engage youth. Groundwork Portland works to organize communities of color, low-income communities, and youth around vacant land in their communities, plan for its cleanup and redevelopment, and access the resources necessary to transform the land.

In Partnership with:

City of Portland Brownfield Program
Oregon Tradeswomen, Inc
GeoEngineers
TestAmerica

With Funding from:

East Multnomah Soil and Water
Conservation District's Partners
In Conversation Program

Groundwork PORTLAND

503.662.2590
2407 SE 49th Avenue
Portland, Oregon 97206
cause@groundworkportland.org
www.groundworkportland.org



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OSALT



Oregon Sustainable Agriculture Land Trust

Groundwork PORTLAND

CHANGING PLACES
CHANGING LIVES

You Are Invited To Participate

Voice your ideas & design EMERSON GARDENS

- What plants and flowers should be grown?
- How else might the space be used & who will use it?

2 COMMUNITY DESIGN FORUMS:

April 17th, 1:00-4:00 pm May 6th, 6:00-8:30 pm
Blazer's Boys & Girls Club Multi-Cultural Senior Ctr.
5250 NE MLK Jr. Blvd 5325 NE MLK Jr. Blvd.

GROUND BREAKING CEREMONY:

June 26th at 822 NE Emerson St. -- 1:00 pm



Everyone
has the right to a livable community.
Groundwork
PORTLAND



Blazer's Boys and Girls Club are the first gardeners at Emerson Street Garden

Let the Life Back In

After years of dreaming about the garden, it's time to get dirty. Groundwork Portland and OSALT will work with neighbors to design the garden and begin an annual growing season that will benefit generations to come.

The community garden will be placed in the front part of the site until the lead is cleaned up in back. Ideas for the garden so far are fruit trees, perennial plants like blueberries and grapes, and places for annual vegetable crops. Let us know what you want to grow!



Get the Lead Out

Several decades ago, the house at 822 NE Emerson burned down, leaving behind lead contamination from paint and pipes. Lead is a common contaminant on city lots, but it's not safe at high concentrations, especially in places where kids play and food is grown.

Groundwork Portland, OSALT and our community partners will move the contaminated soil to the back of the garden and work together over the next five years to clean up the lead with a combination of plants and composting. Careful monitoring for lead in soil and plants will be conducted throughout the cleanup process.

C-3: Presentation from Charrettes

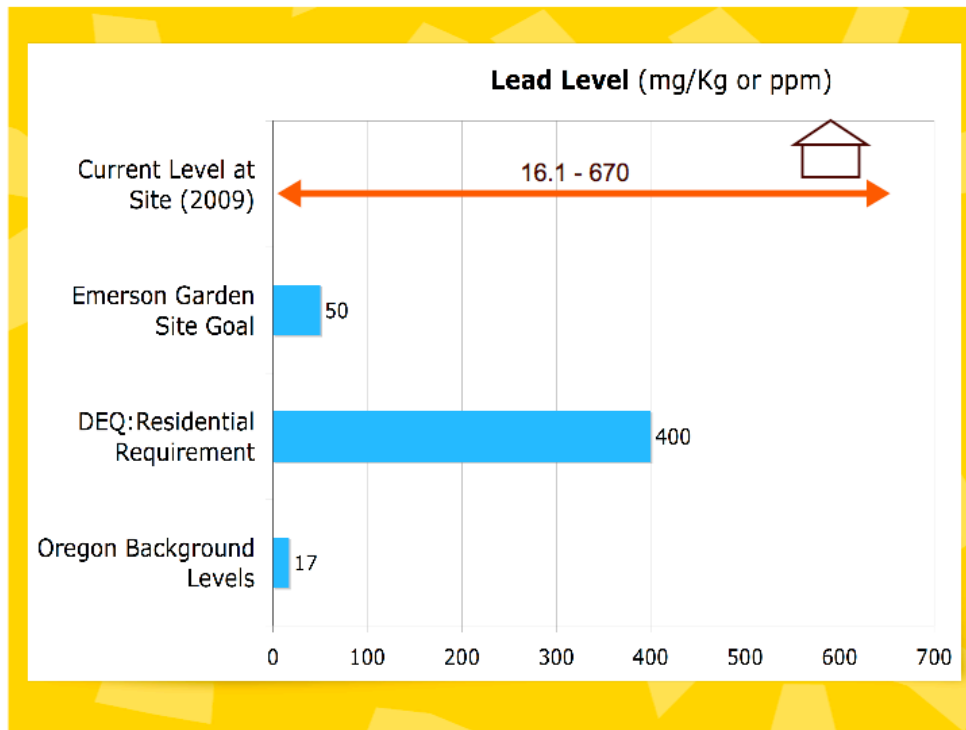




What are Brownfields?

- ⇒ Brownfields are vacant or abandoned properties with real or perceived contamination.
- ⇒ The garden site is considered a brownfield because of the level of Lead in the soil.





Where did the Lead come from?

- In the US, Lead can be found in paint used before 1977 and some other building materials.
- Lead from the paint and other materials from the house was introduced to the soil when the house burned down.
- Lead and tiny pieces of paint still remain in the soil today. Especially where the house stood.



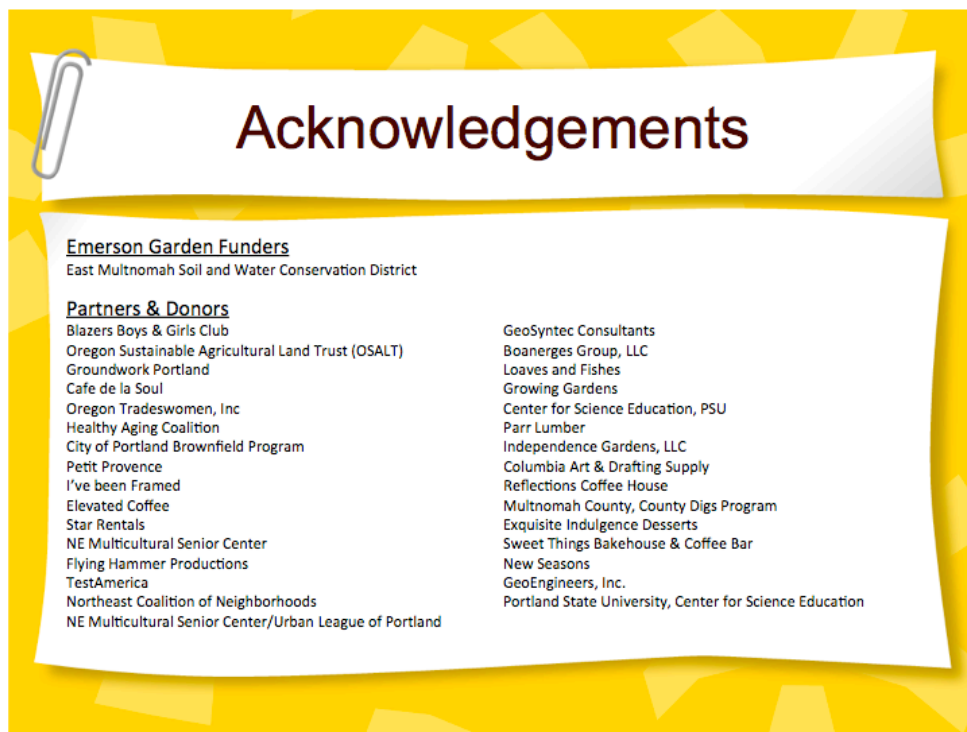
Is the site safe?

- ⇒ **Yes**, it is safe to work at the site. There is **no risk** from touching the soil, walking through the site, or from the water or air.
- ⇒ **No**, it is not safe to eat the soil. There is **some risk** for eating plants that take up Lead.



How do we make it safe for food?

- ⇒ Saturday we will remove and contain the top 1-inch of soil over entire site and the top 3-6 inches in area around where the house had been.
- ⇒ We will begin gardening with raised boxes, and clean soil/compost from OSALT. We will use cover-cropping and soil-building in other areas.
- ⇒ We will use phyto-remediation (using plants to dilute Lead naturally over time) to make the contaminated soil safe to use in the garden.



Acknowledgements

Emerson Garden Funders
East Multnomah Soil and Water Conservation District

Partners & Donors

Blazers Boys & Girls Club	GeoSyntec Consultants
Oregon Sustainable Agricultural Land Trust (OSALT)	Boanerges Group, LLC
Groundwork Portland	Loaves and Fishes
Cafe de la Soul	Growing Gardens
Oregon Tradeswomen, Inc	Center for Science Education, PSU
Healthy Aging Coalition	Parr Lumber
City of Portland Brownfield Program	Independence Gardens, LLC
Petit Provence	Columbia Art & Drafting Supply
I've been Framed	Reflections Coffee House
Elevated Coffee	Multnomah County, County Digs Program
Star Rentals	Exquisite Indulgence Desserts
NE Multicultural Senior Center	Sweet Things Bakehouse & Coffee Bar
Flying Hammer Productions	New Seasons
TestAmerica	GeoEngineers, Inc.
Northeast Coalition of Neighborhoods	Portland State University, Center for Science Education
NE Multicultural Senior Center/Urban League of Portland	

Additions for charrette 2

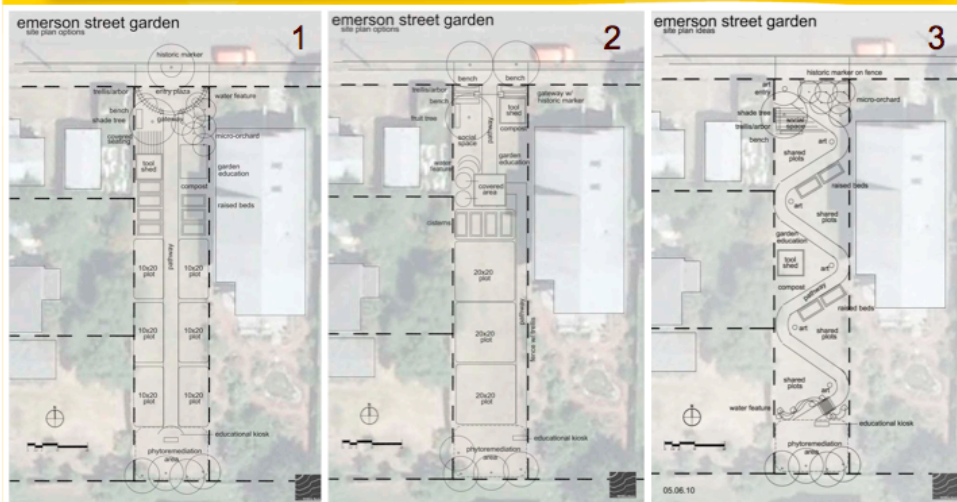
Design Forum 1 on April 17

➔ There is a summary of the highlights from the first design forum on your tables. (Bright Green Paper) Please take a moment to read it! Feel free to make suggestions and comments.

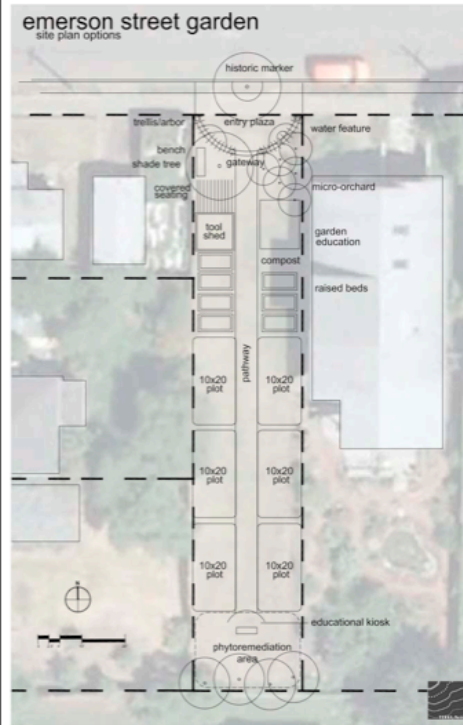


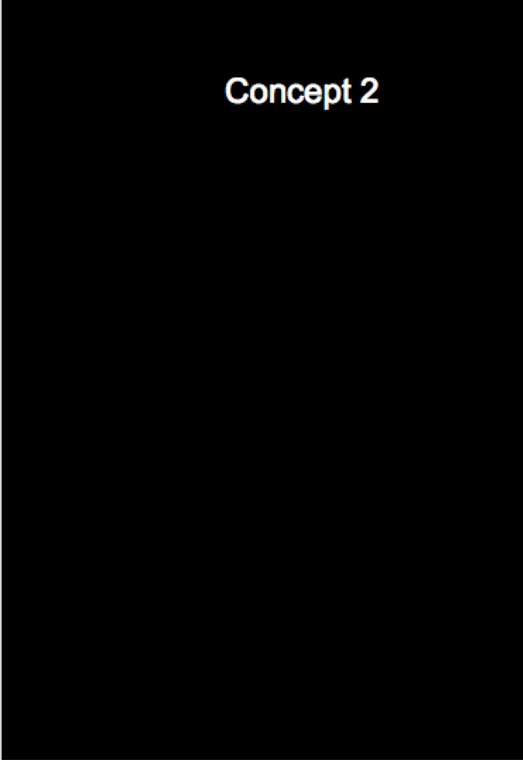
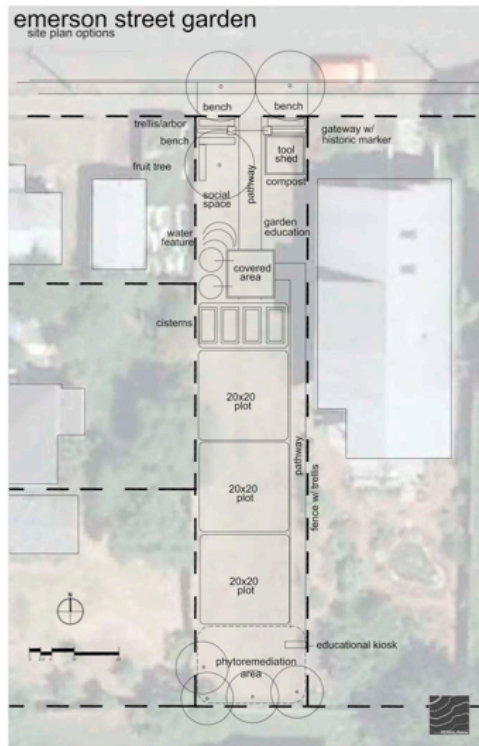
Site Plan Concepts

Based on feedback from Design Forum 1

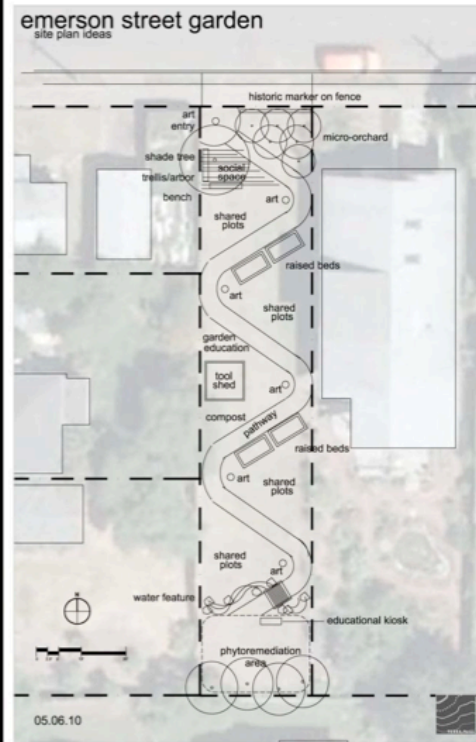


Concept 1



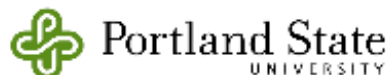


Concept 3



APPENDIX D: Human Subjects Approval

D-1: Original Approval



Human Subjects Research Review Committee

Post Office Box 751
Portland, Oregon 97207-0751
503-725-4288 tel
503-725-3416 fax
hsrrc@lists.pdx.edu

April 22, 2010

To: Charissa Stair

From: Nancy Koroloff, HSRRC Chair

Re: Approval of your application titled, "Using Brownfields to Think Green" (HSRRC Proposal # 101276).

Dear Charissa,

In accordance with your request, the Human Subjects Research Review Committee has reviewed your proposal referenced above for compliance with DHHS policies and regulations covering the protection of human subjects. The committee is satisfied that your provisions for protecting the rights and welfare of all subjects participating in the research are adequate, and your project is approved. Please note the following requirements:

Changes to Protocol: Any changes in the proposed study, whether to procedures, survey instruments, consent forms or cover letters, must be outlined and submitted to the Chair of the HSRRC immediately. The proposed changes cannot be implemented before they have been reviewed and approved by the Committee.

Continuing Review: *This approval will expire on April 22, 2011.* It is the investigator's responsibility to ensure that a Continuing Review Report (available in ORSP) of the status of the project is submitted to the HSRRC two months before the expiration date, and that approval of the study is kept current.

Adverse Reactions: If any adverse reactions occur as a result of this study, you are required to notify the Chair of the HSRRC immediately. If the problem is serious, approval may be withdrawn pending an investigation by the Committee.

Completion of Study: Please notify the Chair of the Human Subjects Research Review Committee (campus mail code ORSP) as soon as your research has been completed. Study records, including protocols and signed consent forms for each participant, must be kept by the investigator in a secure location for three years following completion of the study.

If you have questions or concerns, please contact the HSRRC in the Office of Research and Sponsored Projects (ORSP), (503) 725-4288, 6th Floor, Unitus Building, 4th & Lincoln.

Cc: William Becker

D-2: Annual Review and Renewal Approval



Human Subjects Research Review Committee

Post Office Box 751
Portland, Oregon 97207-0751

503-725-4288 tel
503-725-8170 fax
hsrrc@lists.pdx.edu

April 6, 2011

To: Charissa Stair

From: Mary Oschwald, HSRRC Chair

Re: HSRRC renewal of approval for your project titled, "Using Brownfields to Think Green"
(HSRRC Proposal # 101276)

As part of the Committee's continuing review, the Human Subjects Research Review Committee has reviewed your above referenced project for compliance with Department of Health and Human Services policies and regulations on the protection of human subjects.

The Committee is satisfied that your provisions for protecting the rights and welfare of all subjects participating in the research are adequate. **Your project is renewed and this approval will expire on 4/22/2012.** Please note the following policies:

1. If the project continues beyond the expiration date, the investigator needs to submit a *Continuing Review Report* form two months before the expiration date. The form is available at www.rsp.pdx.edu/compliance_human.php and in the Office of Research & Sponsored Projects.
2. To add this project's continuing review to the HSRRC/IRB meeting agenda, please refer to the HSRRC/IRB meeting schedule. Submit the report, and the required number of copies, by the submission deadline that is approximately two months before the project's expiration date. The HSRRC/IRB needs two months to do a continuing review of the project, so it is extremely important that you meet the committee's submission deadline.
3. If this project finishes before the expiration date, please contact the HSRRC administrator so that the file can be closed and records updated. It is the investigator's responsibility to keep the approval status current. If the project's approval expires while the project is active, the investigator must complete a new application and submit it for a new HSRRC review. In addition, any data collected after the expiration date cannot be used in the research. Please don't let this happen!

If you have questions or concerns, please contact the HSRRC in the Research and Strategic Partnerships (RSP) office, 503-725-4288, Unitus Building, 6th Floor, 4th and Lincoln Streets.

cc: William Becker