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What Is Urban Environmental Stewardship? Constructing a Practitioner-Derived Framework

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Abstract

Agencies and organizations deploy various strategies in response to environmental challenges, including the formulation of policy, programs, and regulations. Citizen-based environmental stewardship is increasingly seen as an innovative and important approach to improving and conserving landscape health. A new research focus on the stewardship of urban natural resources is being launched by the U.S. Forest Service in the Pacific Northwest region.[2] Early scoping efforts are addressing various scales of human systems ranging from individuals to organizations to the entire positive "footprint" of stewardship on the land. This report addresses a fundamental need—to understand and describe civic environmental stewardship in urban settings. Stewardship has been described and defined in diverse ways within a variety of contexts, including the philosophical literature of environmentalism, agency program descriptions, and outreach by sponsoring organizations. Constructing a framework to convey the layered meanings of stewardship will help to focus and guide future research. A cognitive mapping technique was used to elicit responses to the question "What is environmental stewardship?" Semistructured interviews were conducted with representatives of nine Seattle environmental organizations, a group of practitioners who collectively represent over 100 years of experience in the field. Program planners and managers have particularly direct experiences of stewardship.

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[2] This publication is one of a series of scientific and technical reports produced by the Green Cities Research Alliance, a research program based in the Puget Sound region, where more than 80 percent of the population lives in urbanized areas. The collaborative partnership includes the U.S. Forest Service, universities, nongovernmental organizations, and local government agencies. Research efforts focus on the social environmental situations of urbanized areas, and products will help promote more sustainable urban landscapes and more livable cities. More information is available at http://www.fs.fed.us/pnw/research/gcra/.

Cognitive mapping enables participants to explore, then display, their particular knowledge and perceptions about an idea or activity. Analysis generated thematic, structural representations of shared concepts. Results show that the practitioners have multilayered perceptions of stewardship, from environmental improvement to community building, and from actions to outcomes. The resulting conceptual framework demonstrates the full extent of stewardship activity and meaning, which can aid stewardship sponsors to improve stewardship programs, leading to better experiences for participants and higher quality outcomes for projects and environments.

Keywords: Stewardship, urban environments, community-based organizations, natural resources management, civic ecology, social ecology.

Rationale for Studies of Civic Environmental Stewardship in Cities

Scientific and popular publications highlight many landscape-scale environmental concerns and challenges, particularly in urban areas. The human impacts in such situations are often assumed to be negative. Many ecologists describe human populations as somehow separate from ecosystems, and identify them as the source of negative anthropogenic effects. Yet solutions and remedies for declining ecological systems, particularly in cities, must involve and be integrated with human systems.

Government agencies identify and formulate policy to address environmental issues and concerns, but lack adequate resources (particularly in current economic conditions) to comprehensively restore or mitigate environmental systems. Citizen-based stewardship activity is increasingly acknowledged by scientists and policy-makers as a viable strategy to address ecological concerns (Brinkley et al. 2010, Wolf and Kruger 2010). Agencies often endorse stewardship (such as the Puget Sound Partnership and the Environmental Protection Agency's Everyday Choices) as a means to promote and conserve ecosystem health.

There have been few evaluations of stewardship participation or outcomes in the urban context.

There are extensive anecdotal reports of grassroots environmental stewardship (Hawken 2007), yet there have been few systematic evaluations of participation or outcomes within the urban context. Across cities, thousands of citizens commit to working in association with organizations and agencies on behalf of environmental recovery and health. However, little is known about the consequences of this ecologically based civic-engagement activity, including the scope, spatial distribution, and characterization of such activity.

In recent years, environmental stewardship has become a substantial public response at the grassroots level. Within the Puget Sound basin and Seattle metropolitan region, this phenomenon is the basis of a multiphase scientific program to

determine the stewardship "footprint" and assess the level to which citizen-based stewardship provides an effective response to ecological concerns (GCRA 2010, Wolf et al. 2011).

This report describes an early effort in that scientific program. Its purpose is to generate a working framework of civic stewardship concepts and outcomes that can serve as the basis for research questions and hypotheses. The term "stewardship" is currently applied to a variety of intentions and practical settings, which can confound potential research questions, analyses, and results. Imbedded within any conceptual model should be an understanding of geographic and social scales, participant variability, and expected land or resource outcomes. Refinement of the meaning of stewardship will be beneficial not only to future research within the Seattle area, but also to other researchers and practitioners working with and studying these themes. Shared definitions will also facilitate comparisons of stewardship across scales, cities, and time.

Stewardship occurs across the entire landscape gradient, from wildlands to urban areas, and is conducted on both public and private lands. The scope of this report is civic urban stewardship, that is, volunteer efforts by citizens on public or quasi-public lands within higher density urban areas. Citizens of all ages volunteer for projects and work on lands they do not personally own. Such projects include park management, open space restoration, street tree planting, and development of community gardens.

This civic activity is managed by key individuals who work within formal and informal organizations. Drawing on their professional experience and volunteer interactions, these committed practitioners can offer important insights. Their perceptions, obtained in a structured interview process, were used to derive a preliminary framework of stewardship definitions and research questions. This report is organized as follows. First, the emergence of urban-based research is described, including the value of constructing frameworks to explore new scientific realms. Informal stewardship definitions are presented as one inductive framework, followed by additional evidence that supports a multidimensional stewardship framework. Cognitive mapping theory and method were used in a preliminary data collection approach. The responses of expert informants are characterized. Finally, analysis across cognitive maps supports a civic stewardship framework, followed by a presentation of conclusions and implications.

Background

The U.S. Forest Service's Role in Urban Forestry Research

For more than a century, the U.S. Forest Service has been a recognized leader, domestically and internationally, in the science and management of natural resources, particularly forests. Within a general conservation ethic, the agency develops, implements, and adapts resource planning and best management practices. Although the agency's historic focus has been primarily wildland and rural landscapes, U.S. demographic conditions have changed markedly during its tenure. The growth of urban areas in the United States has been dramatic. Today, 80 percent of the Nation's population lives in metropolitan areas that occupy less than 20 percent of the land area (Auch et al. 2004).

In recent decades, the agency has responded to population and land use trends, generally on a region-by-region basis. Several Forest Service research stations, reflecting regional urban growth trends, now include urban forestry and urban natural resources stewardship in their research and management mission. Some national forests now interact with and attract urban-based constituents. Since the early 1990s, the Forest Service State and Private Forestry branch has supported urban programs within its Urban and Community Forestry program. Additionally, urban conditions have appeared in U.S. Forest Service strategic plans (USDA FS 2007), articulating the need for urban research and explicitly delineating the goal of engaging urban America with Forest Service programs.

The Puget Sound watershed is the initial focus area for the Pacific Northwest urban research.

Urban-based research is now just emerging in work by the Pacific Northwest (PNW) Research Station, and such efforts are timely. The Seattle/King County metropolitan region is a startup center for this research, and serves as the focal area for a program that may address the entire Puget Sound watershed. The Puget Sound estuary and surrounding urbanized watersheds now support a population of 4.1 million, and are expected to attract an additional 3 million residents in the next 20 years. Seattle grew at least 30 percent per decade between 1940 and 1970. King County ranked 18th among all U.S. counties in absolute population gain between 1970 and 1990, and Pierce County (containing Tacoma) ranked 54th. New settlements included more inland suburbs and exurbanization on the islands of Puget Sound. As the cities continued to expand, a low-density "urbanscape" has formed, extending from Olympia, Washington, in the south to Vancouver, British Columbia, in the north (Auch et al. 2004).

Urban natural resources research needs were recently compiled and assessed based on input from stakeholders and professionals across the U.S. Pacific Northwest region (Wolf and Kruger 2010), and results serve to inform a regional approach to urban natural resource science. Stewardship is one element. The

U.S. Forest Service has long supported stewardship research and programs, yet a review of agency publications[3] displays a historical emphasis on wildland and rural landscapes, as well as on private landowners within such areas as watershed and riparian management, forest management by family forest and nontimber landowners, habitat conservation, rangeland management, fire hazard reduction, wilderness values, naturalness in protected areas, and recreation on public lands. Because both the landscape and social conditions of civic stewardship in cities differs from other settings along the urban to wildland gradient, a conceptual framework can be a valuable tool to organize ideas and research questions, and to recruit nontraditional partners needed for successful research in cities (Brinkley et al. 2010, Svendsen and Campbell 2008, Westphal 2003).

Conceptual Framework

Within the sciences, the conceptual framework has become a ubiquitous approach to organize the theoretical basis of a study or research program. Yet the fundamentals of how a framework is devised and used are rarely articulated. As we embark on a new research program, expansive in knowledge-building scope and landscape geography, we are faced with choices about the sources and constructs that may inform research efforts. A multiphase, formative approach based on inductive inputs is our preliminary (and a common) means of framework construction.

What are the characteristics of frameworks, and what purposes do they serve? Considering the increasing complexity of information and experience surrounding any human endeavor, conceptual frameworks are useful in professional realms. Within a Web search that focused on professional practice, we found that frameworks serve multiple and diverse functions for any group of people who need a shared basis for decisionmaking and action, such as a partner-shared project or a workplace. Within the professional and management context, a conceptual framework can serve as:

- A shared and clearly articulated set of assumptions, values, and definitions to guide work and activity.
- A condensed outline of key learnings gained from past experience and practice.
- A set of coherent ideas or concepts organized in a manner that provides a common vocabulary and is easy to communicate to others.
- An overview of ideas and practices that guide how work is planned.

[3] A review was conducted using TreeSearch in October 2010: http://www.treesearch.fs.fed.us/.

- An organized way of thinking about project practices, including component activities.
- A basis for thinking about what is being done, its meaning, and comparison to the ideas and practices of other disciplines.

The use of frameworks in science differs somewhat, being less normative, and more often used for theory support or development by way of guided empirical exploration. Research is, in part, a process of directed attention with a focus on defining and responding to key questions that draw on appropriate concepts (Bouma 1993). Professional frameworks are often used to communicate accepted procedures and expectations within organizations. Research is an open-ended pursuit, and frameworks help to bound the focal points of any research study, ultimately serving to guide choices of methods. Thus conceptual frameworks serve two major purposes in the research process—communication of theory and method development (Leshem and Trafford 2007).

Frameworks often support theoretical clarification of what researchers intend to investigate. A framework is "a structure for organizing and supporting ideas; a mechanism for systematically arranging abstractions; sometimes revolutionary or original" (Weaver-Hart 1988, p. 11). Framework development (or adoption) encourages the investigator to be explicit about fundamental principles and their relationships (Robson 1993). May (1993, p. 20) noted that "theory, or the ability to interpret and understand the findings of research within a conceptual framework which makes 'sense' of the data, is the mark of a discipline whose aim is the systematic study of particular phenomena."

A conceptual framework supports systematic study of phenomena and guides the choice of research methods.

The second purpose of a framework is more practical and immediate; it guides choices of specific research questions and methods. Research work is more focused when key concepts and contexts are defined; they define the territory of the research, indicate the literature that needs to be consulted, and suggest the methods and theories to be applied (Blaxter et al. 1996). Robson (1993, p. 150) observed that "developing a conceptual framework forces you to be explicit about what you think you are doing. It also helps you to be selective; to decide which are the important features; which relationships are likely to be of importance or meaning; and hence, what data you are going to collect and analyze." This iterative dynamic implies that frameworks evolve as research evolves, elucidating purpose (boundaries) with flexibility (evolution) to maintain coherence across the research activity (Leshem and Trafford 2007).

Considering all the potential purposes and functions of a framework, the preliminary framework reported here will initiate the conceptualization of a suite

of studies that seek to understand civic environmental stewardship at different human and ecological scales. Owing to the limited literature on urban natural resources stewardship, theory development is another important outcome to be initiated with this work. From research startup to theory support, the framework will stand in as a working hypothesis to aid in structuring initial assumptions, constructing a set of descriptive and interrelated principles and categories, and suggesting measures and methods to both confirm and expand explanations (Botha 1989).

Stewardship Descriptions and Definitions

Though environmental stewardship may be a vital aspect of a wide variety of activities such as volunteerism, civics, environmentalism through collaboration and partnership, and community-based activity, there is no widely shared definition of the term. In the 1940s, Aldo Leopold interpreted environmental stewardship as the commitment of a person to the land, where land has broad, natural, place-based connotations. His definition of a "land ethic" and its manifestation through stewardship was one of the early and foundational discussions on the meaning of environmental stewardship (Leopold 1949).

The concept of stewardship is wide-ranging and is applied to many settings and activities.

Since then, the concept of stewardship has become a wide-ranging notion applied to many contexts and activities. In contemporary writing, stewardship is variably defined or described as an ethic, a tool, a result, or a goal. Little has been done to synthesize or categorize environmental stewardship types or components. After collecting descriptions from both practical and theoretical sources, we interpreted several themes (table 1). (1) First, the early assertion of an **ethic** or **responsibility** at a societal scale by Leopold continues within the discourse. The ethical stance includes respect and humility, implying that people have responsibilities associated with their existence in the natural world. (2) There is also recognition that **motivation** for stewardship can be more personal as individuals are compelled by more direct expectations and realizations. (3) Action on the land also entails **process**, and includes the contributions of knowledge and tasks by entities across social scales, from individuals to institutions. (4) The fourth theme that emerged in our cursory review was **outcomes**, which might include both social dynamics and place or nature changes.

One difficulty in defining the term is that practical aspects of environmental stewardship can be contradictory. For example, stewardship is often perceived as ownership of place (Kaplan et al. 1998, Svendsen 2009); however, the term is also used to refer to something that cannot be owned or is strictly communal (Hester 2006, Svendsen and Campbell 2008). Another contradictory set of assumptions

Table 1—Descriptions of stewardship

Description	Source(s)
Ethic or Responsibility	
Something that is a responsibility.	Hester 2006
Recogni[zing] that humanity is but one element of a complex web in ecology.	Carr 2002
Something that is voluntary use of discretionary time.	Grese et al. 2000, Svendsen and Campbell 2008
A relationship with the Earth that is based on respect for nature, and a current and ongoing commitment to "active earthkeeping" akin to a custodial or guardianship role.	Carr 2002, p. 15
A moral or religious responsibility to life on Earth, as part of nature, not having dominion over nature.	Carr 2002, p. 15
Motivations	
Actions based on different extrinsic and intrinsic motivations.	McPherson 1993, Ryan 2006
Often compelled by personal connections to a natural resource or system that is in decline, neglect, or is threatened.	Carr 2002
An expression of human creativity driven by perceptions of need, premised on the deep-seated traditions of volunteerism in America.	de Tocqueville 1835
Environmental work for personal benefit.	Grese et al. 2000, Svendsen 2009, Ulrich 1984
Shared lifestyle preferences and beliefs about the way in which common property resources contribute to a unique quality of life.	Carr 2002, p. 15
Beyond an individual connection (with our planet) to encompass collective responsibility.	Carr 2002, p. 15
Process	
Land stewardship as numerous volunteers help with monitoring, clearing invasive plants, collecting seeds, and planting. Volunteers also perform services that are less directly tied to the land, including disseminating information (via newsletters for example) and maintaining databases.	Grese et al. 2000, p. 265
Guided by peer leadership or on recommendations of ecologists and urban planners.	Carr 2002
To protect, nurture, and advocate.	Grese et al. 2000, p. 62
Combines land management with the desires of civil society, the private sector, and government agencies.	Svendsen and Campbell 2008, p. 1
Something that cannot be owned nor is strictly communal.	Hester 2006, Svendsen and Campbell 2008
Strategy that includes elements of direct action, self-help, and often education and community capacity building.	Svendsen and Campbell 2008, p. 1
Less rooted in oppositional social movements and more in accessing the rights to space through collaborative, community-based resource management.	Svendsen and Campbell 2008, p. 1

Table 1—Descriptions of stewardship (continued)

Description	Source(s)
Outcomes	
Flower plantings and urban gardening.	Grese et al. 2000, p. 70
Tree-planting projects and other horticultural activities… ongoing commitment by local volunteers to maintain and nurture... Watering, pruning, and weeding.	Ryan 2006, p. 70
Work strictly for the environment.	Tedesco et al. 2006
Taking positive action to repair and heal past ecological damages while building a positive relationship with a place.	Grese et al. 2000, p. 275
Place-based over issue-based.	Barlett 2005, Francis and Hester 1990
About the cause rather than the place.	Barlett 2005
For the community.	Svendsen 2009, Westphal 2003
Ownership of place.	Kaplan et al. 1998, Svendsen 2009
Work meant for others.	Svendsen and Campbell 2008

is that stewardship work is meant for the benefit of others or the community as a whole (Svendsen and Campbell 2008), as opposed to personal benefit (Grese et al. 2000, Svendsen 2009, Ulrich 1984). Each of these insights is indicative of a spectrum of attitudes or assumptions about environmental stewardship and although each of the components of environmental stewardship is significant, there is no generally agreed-upon definition of the term. To outline a research program, a more coherent and accessible understanding of civic environmental stewardship is needed. We seek to define stewardship in ways that practitioners, as well as researchers, can understand. This will allow for a shared functional and practical understanding of the spectrum of variations, which can lead to improved implementation of stewardship research and programs.

The term "stewardship" is currently applied to a variety of meanings and practical settings, which can confound potential research questions, analyses, and results. Imbedded within the concept are considerations of geographic and social scale, range of participants, expected land or resource outcomes, and research methods and analyses. Less ambiguous framing of the concept will serve as a guide for research in the urbanizing Pacific Northwest, and will facilitate long-term and cross-site comparisons of stewardship outcomes.

Cognitive Structures and Mapping

Citations from books and articles provide one set of representations for the concept of stewardship. Expert cognitions comprise another. Intentional understanding of cognitive representations held by those who are actively engaged as professionals within a domain can be a valuable input. Except for the most direct descriptions of the physical world, a framework represents a collectively constructed social structure of an idea or domain. Conceptual frameworks can be the products of both individual contemplation and social discourse within a community of practice such as stewardship.

Cognition is a complex and multidimensional field of study, encompassing everything that involves thinking or learning, and which may be simplistically defined as "knowing about something… [and]… the act of knowing" (Styles 2005, p. 14). Researchers examine human cognitive processes through mental representations, without reducing them to a biological or neurological level (Matlin 2005). Mental models guide people's perceptions, decisions, and behavior regarding environmental problems and other issues. Hence, understanding these models may aid in understanding how people perceive problems, in determining how information may be most effectively shared, and in designing strategies for behavior change (Kearney and Kaplan 1997).

Cognitive maps are tangible expressions of implicit representations. The term is variously defined in the literature, perhaps because "the cognitive map idea is often employed more as a metaphor than a theory" (Kaplan and Kearney 1997, p. 584). Cognitive mapping has been widely used across many disciplines in connection with spatial cognition (Csanyi 1993), such as wayfinding in hospitals, and more recently extended to conceptual themes. Accordingly, descriptions of cognitive mapping techniques include both spatial connotations, such as those used by geographers (e.g., Downs and Stea 1973), and conceptual connotations, largely used in the social sciences to understand organizations (Tegarden and Sheetz 2003), to examine decisionmaking (Axelrod 1976), to explore meaning (Jacob and Luloff 1995), and as a tool in education (Bennett and Lehman 2002).

Cognitive maps may represent physical space or may reveal the structure of ideas.

Schema is a term that can be applied to the structural elements of a cognitive representation. Conceptual schemas capture relations, which hold between concepts or arguments that are not interchangeable (Coronges et al. 2007, Posner 1989). Therefore, two main elements are central to any cognitive map: concepts and relations. Concepts are used to represent tangible (i.e., objects, events, and facts) and intangible (i.e., emotions, sensations, and meanings) aspects of social reality. The number of concepts used in a cognitive map varies, and there is no agreement on the optimal number of concepts to be used in a map.

Several types of relations can link concepts, including causal, association, equivalence, topological, structural, and chronological (Gómez et al. 2000). Graphical representations of concepts and of the relations between them result in different expressions of cognitive maps or conceptual networks for a single idea or phenomenon (Bitonti 1993, Mohammed et al. 2000). In summary, a cognitive map is the spatial location of elements (i.e., concepts) within a network that indicates interpretation of relationships between concepts (Coronges et al. 2007, Huff 1990).

The objective of conceptual cognitive mapping is usually to assess the structure and content of an individual's knowledge structure, but there are a variety of techniques for deriving and analyzing the maps. Generally speaking, most techniques comprise four processes: knowledge elicitation, constructing and refining concepts and their relations, analysis, and aggregating cognitive maps for comparison (Hodgkinson and Clarkson 2005, Tegarden and Sheetz 2003). Concepts can be elicited from existing documents (Axelrod 1976), open-ended interviews of research subjects (Bennett and Lehman 2002), questionnaire responses from research subjects (Robert 1976), or from the research participants directly (Kaplan and Kearney 1997). Relationships are identified using qualitative analysis with scope for rich description, and may involve some type of quantitative analysis, including multivariate techniques (Kaplan and Kearney 1997).

The operational definition used in this study is that "Cognitive mapping is a technique that captures an individual's view of a particular issue in a graphical representation" (Tegarden and Sheetz 2003, p. 114). Two general approaches are possible when collecting data directly from research participants (Curseu et al. 2010). In the ideographic approach, the researcher collects the concepts that are used by an individual or group to describe a particular task or situation. In nomothetic elicitation, the researcher provides predefined concepts based on theoretical models or hypotheses, and seeks structural interpretations from respondents. Nomothetic methods are often criticized because the set of concepts used by the researcher might prove meaningless for participants, thus the emerging conceptual structure may actually be an artifact of the research method.

In this study, we used an ideographic elicitation method, specifically Conceptual Cognitive Content Mapping (3CM), a technique developed by Kearney and Kaplan (1997) to collect information that fully reflects respondents' conception of a topic and encourages them to display their thoughts in a graphical representation. As opposed to nomothetic methods that limit respondents to a finite list of choices, the 3CM process elicits an individualized and rich perceptual response that may include hierarchies, systems, relationships, and groups within a selected theme, which in this case was civic environmental stewardship. The approach draws out a person's most salient understandings, allowing a respondent to externalize potentially inaccessible notions. Within a 3CM interview, the responder is the only one providing information, taking direct ownership of her cognitive map about a phenomenon, and is not biased or prompted by any other ideas or perceptions beyond the initial question (Kearney and Kaplan 1997).

The notion of "ownership" is important, as participants can highlight the particular concepts or factors that are relevant to an issue of interest and provide a graphical indication of their perceived relationships among these factors (Kearney and Bradley 1998). Implementations of 3CM have been tailored to different contexts and purposes, and results indicate that the approach meets the criteria of construct validity, of being user-friendly, and of providing information complementary to that obtained using more traditional social measures (such as surveys).

Methods

A variety of disciplines (e.g., psychology, sociology, organization studies, and education) use cognitive mapping as an elicitation and evaluation technique. To identify a practitioner-derived definition of stewardship, we conducted 3CM interviews with individuals of nine not-for-profit environmental groups in Seattle, representing a cross section of organizational size and mission focus. This participatory approach

to concept building acknowledged the particularly relevant and complex perceptions and knowledge of practitioners who are working in environmental stewardship. Actively engaging thought and program leaders can provide understandings about a significant, but likely underestimated, environmental action community across urban landscapes. This paper focuses on the resultant cognitive maps and participants' descriptions of them, as they provided a rich, dimensional data set of a type hitherto largely unexplored in the literature on environmental stewardship.

Selection of Organizations and Participants

Nine organizations were drawn from among many that are recognized for their leadership in metropolitan Seattle stewardship efforts. The initial assessment criteria for selection was that the organizations had a long-term presence (at least a decade) in stewardship efforts, had conducted on-the-ground field programs on public properties, and had organized nonexpert volunteers to conduct field work. Some organizations may also conduct programs that are less grassroots-based, such as political advocacy or scientific monitoring. Nonetheless, both organization and participant selection was done to represent entities that are recognized as principal influences on the development and management of civic stewardship programs in Seattle, Washington.

Careful selection of participants was important in this study, as in any qualitative research approach. After assembling a candidate pool using Web-based information, the second-tier selection criteria for participant organizations were that they had:

- Worked in the Seattle area for at least 15 years (to tap perceptions based on rich historical context).
- Cooperated with communities (to provide extensive place-based experiences).
- Collaborated extensively with other organizations (to allow for construction of shared concepts).

Organizations were additionally screened based on organizational size (from one volunteer to a staff of more than 50), geographic scope of programs (from a 60-acre [24.3 ha] park to the entire Puget Sound watershed), and stewardship goals (from watershed restoration to youth engagement). Recommendations were solicited from staff of one particularly well-established and connected organization (Cascade Land Conservancy [now known as Forterra]) as well as the extensive knowledge of the senior researcher on our team, who has worked with community-based organizations in Seattle for more than a decade.

A list of 15 organizations was constructed; all were contacted, with 12 responding. Interviews were conducted with 9 organizations representing 3 size categories (table 2). Three organizations (Friends of Leschi, Friends of Interlaken, and P-Patch Trust) were completely volunteer-based, with no paid staff members. These three were designated as "small" organizations. Three organizations were considered to be "mid-sized" (EarthCorps, Seattle Tilth, and the local office of the Student Conservation Association) and three were designated "large" (Cascade Land Conservancy/Forterra, Mountains to Sound Greenway Trust, and People For Puget Sound). These categories were based on the organizations' scope of activities, funding, and partnerships. The range of sizes and missions was purposefully constructed to avoid overrepresentation of one scale of organization.

We were equally particular in our choice of which organizational representative to interview. Tenure was the main criterion in selecting participants; each interviewee had extensive experience and historical context from which to recount a representation of stewardship. All participants were in high-level leadership positions within their organizations, yet they also worked directly in field programs in various communities. Several of the participants had been with their respective organization since its founding, and all organizations were represented by participants who were among the longest-tenured staff members. Because three organizations elected to have more than one interviewee, the number of people who participated differed for each organization. Six groups were represented by a single person, two by two people, and one by three people. There were 13 participants in total.

Although both organizational and participant selections were deliberate, any individual's responses did not necessarily represent the organization as a whole. Interviewees were asked questions about their organizations but were also asked to describe their own thoughts and perceptions. It is expected that participant experiences are shaped by their affiliations, although we recognize that personal cognitions can differ greatly from official organizational statements.

Interview Process

Interviews with the nine organizations were conducted during late summer 2009. Two-hour semi-structured interviews included approximately one hour of open response questions, followed by 30 minutes dedicated to the 3CM exercise, and the final 30 minutes given to discussion of broader issues of stewardship and future research. Three groups (Friends of Leschi, Friends of Interlaken, and P-Patch Trust) offered tours of their sites so that participants could better illustrate their stewardship efforts. All participants displayed an infectious passion for their work. Four

Table 2—Seattle organizations participating in the study of urban environmental stewardship

Organization	Year founded[a]	Age (years)[b]	Number of paid staff[b]	Geographic scope	Stewardship goals (from mission statement)
Cascade Land Conservancy (Forterra)	1989 (approx.)	20	47	Washington state	Conserving great lands, creating great communities.
EarthCorps	1993	16	22	Western Washington	Building global community through local environmental restoration service.
Friends of Interlaken	1984	25	0	Interlaken Park (Seattle)	Restore the parks' natural urban forest as a vibrant and healthy environment by 2025.
Friends of Leschi	1985 (approx.)	24	0	Leschi neighborhood (Seattle)	None available.
Mountains to Sound Greenway Trust	1990	19	17	King and Kittitas Counties	Leads and inspires action to conserve and enhance the landscape from Seattle across the Cascade Mountains to Central Washington, ensuring a longterm balance between people and nature.
P-Patch Trust	1979	30	0 (14 member board)	Seattle	To acquire, build, preserve and protect community gardens... Through, advocacy, leadership and partner ships…expands access to community gardening across economic, racial, ethnic, ability and gender lines; promotes organic gardening and builds community through gardening…seeks to break urban isolation by providing opportunities for people to garden together, learn from each other, develop a sense of neighborhood, and create a more livable urban environment.

Table 2—Seattle organizations participating in the study of urban environmental stewardship (continued)

Organization	Year founded[a]	Age (years)[b]	Number of paid staff[b]	Geographic scope	Stewardship goals (from mission statement)
People for Puget Sound	1991	18	24	Puget Sound	To protect and restore the health of our land and waters through education and action.
Seattle Tilth	1978	31	20	Seattle	Inspire and educate people to garden organically, conserve natural resources and support local food systems in order to cultivate a healthy urban environment and community.
Student Conservation Association	1957	52	9 (in Seattle office; 1,000+ nationally)	National	To build the next generation of conservation leaders and inspire lifelong stewardship of our environment and communities by engaging young people in hands-on service to the land.

[a] Used date published on organization Web site. If not available on Web site, used date provided in interview.

[b] As of interview year, 2010.

of the nine interviews took place outdoors, providing an informal meeting location and the opportunity to use place cues to enrich the interviews.

The participants were first prompted to provide open responses to three questions:

- What is the history of your organization?
- Can you describe your organization's main activities?
- Which groups do you collaborate with?

Cognitive Mapping

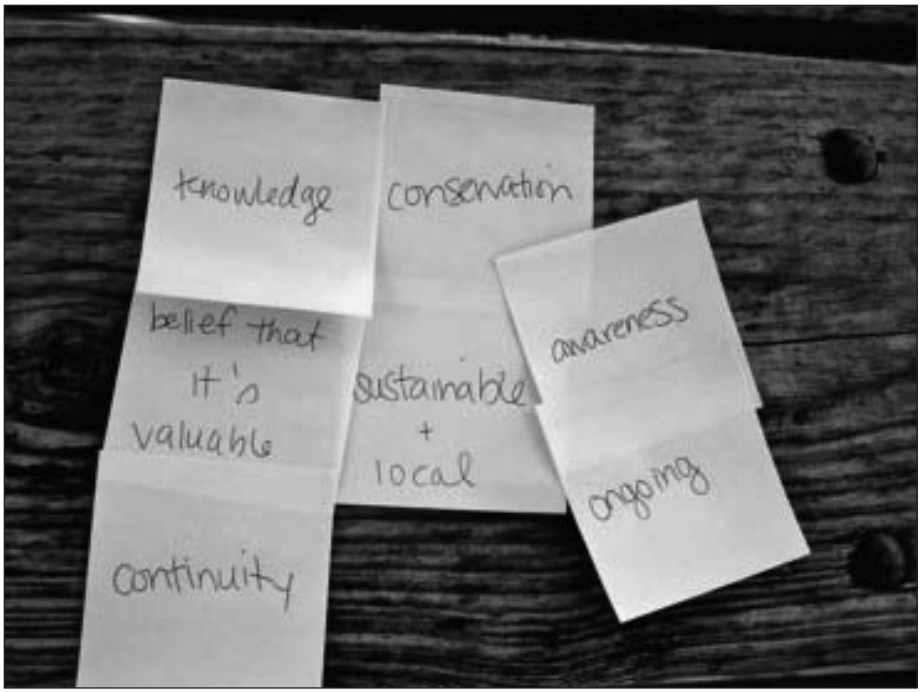
The work of Kearney and Bradley (1998) served as a template for the 3CM exercise. Using a written instruction for consistency, the organization representative(s) were first asked to consider the question "What is environmental stewardship?" They were encouraged to brainstorm ideas, phrases, or terms. Each short response item was written on a note card and placed in front of the participant(s). This process continued until the interviewee(s) generated a collection of note cards. Once the respondents had finished providing new items, they were asked to review their representation of "environmental stewardship" and told that they were permitted to add more note cards at any time.

Respondents were then asked to arrange or group the cards in clusters that would best represent how they perceived the definition(s) of environmental stewardship. Despite some initial hesitancy, all participants completed this task, and a number later expressed satisfaction with the cognitive maps they had produced. Each arranged the cards into groups or systems that provided added meaning and displayed relationships (figure 1). Such perceived relationships were expressed as commonalities in groupings, hierarchies in relationships, or processes in systems. We then asked clarification questions about the arrangement or groups of cards (e.g., Why this grouping? How are these related?). The discussions were recorded, the final arrangements were photo-documented, and the cards were collected and retained.

Analysis and Results

Content analysis has been used since at least the 1950s as a way of analyzing text (Berelson 1952). Content analysis is a systematic, replicable technique for compressing many words of text into fewer content themes based on explicit rules of coding (Krippendorff 2004). The procedure is usually applied to texts, such as interview transcripts. In this effort, content analysis was applied to both interview transcripts and the participants' maps.

Weston Brinkley



Weston Brinkley

Figure 1—Interview participants organize their response items to the question "What is environmental stewardship?"

Exploratory Questions

In the first part of the interviews, participants were asked exploratory questions about their organization's history, activities, and collaboration. This part of the interview yielded insight into the remarkable depth of both the respondents' experiences and their organizations' contributions to stewardship.

Organization background and history—
At the start of each interview, participants were asked to provide a narrative history of their organization. Responses generally included an overview of when and why the organization was formed. With the exception of the Student Conservation Association (founded in 1957), the remaining eight groups were founded within a 15-year period, from 1978 to 1993 (table 2). Most participants reported that their organization was founded in response to an environmental concern. Among these concerns were the declining health of Puget Sound, overuse of national parks, rapid development and disappearance of wilderness areas, spread of invasive species, and the industrialization of agriculture. Some groups described an original mission motivated by more social concerns such as the lack of fresh produce at food banks, the goal of uniting U.S. and international youth in environmental service, and improving recreation areas in urban communities. Responses showed that nearly all groups started as citizen-based, grassroots efforts. While a few organizations now rely more heavily on institutional partnerships and support, all nine organizations still work to cultivate and maintain a strong volunteer base.

Participant background—
Three organizations were represented by individuals who had helped start their organization, each having 25 or more years of experience. These interviewees were able to provide a rich description of how their organization began and how it changed through time. The remaining organizations were represented by individuals who had from 6 to 16 years of experience with their respective group. These participants also had an extensive and personal knowledge about their organizations' founding and history. Content analysis of the transcripts illustrated that each respondent has an array of responsibilities, including managing a large staff or large groups of volunteers, building partnerships, overseeing programs, and fundraising.

The practitioners collectively reported more that 100 years of field experience.

Main activities—
The nine participating organizations sponsor a variety of activities that contribute to environmental stewardship in Seattle and the surrounding region. Some form of youth engagement was mentioned as a main activity by all nine organizations. Groups involve youth through internships, partnerships with Seattle schools, service learning programs, camps, and schoolyard gardens. All participants conduct

education and outreach activities, ranging from formal classes to volunteer outreach events to running a community gardening hotline. Six of the nine groups identified environmental restoration or maintenance as primary activities, including invasive species removal, planting trees and other native species, restoring streambanks, and rebuilding and stabilizing eroded land. Land acquisition/conservation was described as a main activity by three of the nine groups, through land trusts and conservation easements. Two groups reported developing or brokering relationships as an organizational focus, while two others mentioned advocacy as a main activity. Examples of other activities include building community, influencing future leaders, developing nutrition initiatives, and evaluating program outcomes.

Collaboration and networks—
The interviews revealed that participants involve other stewardship organizations, government agencies, local schools and universities, and corporations as collaborators. The groups each reported working with from 6 to 22 organizations, with the average being 15, and all reported that their lists were not exhaustive. The groups are interconnected, with all having collaborated with at least 1 other interviewed group. One (Cascade Land Conservancy/Forterra) was listed as a collaborator by seven other organizations.

3CM Exercise

In a cognitive map, **nodes** represent the concepts in the knowledge domain, and **strings** represent the links between these concepts. Both concepts and links may be extracted from various sources, including interviews, as was done in this study (Carley 1993, Hodgkinson and Clarkson 2005, Mohammed et al. 2000). Several analytic approaches were used to derive the nodes and strings within and across all responses.

Responses sorted into concepts of caring, action, and outcomes, all relating to environment and social community.

Rapid response items—
A frequency count found that, in total, the nine response sets provided 162 words or phrases. Appendix 1 provides a complete list of item responses by participant, and table 3 reports a word count analysis across all respondents for those words appearing more than three times.

While environmental stewardship programs are explicitly dedicated to working on the land to protect or restore natural systems, the keyword frequencies indicated that the represented organizations emphasize human relationships and actions more than was expected, as compared to biophysical or ecological terms. Of the 17 most frequently reported items, “people” is the third most common, with words such as “volunteer(ism),” “relationships,” and “community” also ranking high on the list.

Table 3—Frequencies of the most common interview rapid response items

Common words	Count	Common words	Count	Common words	Count
Taking/acting/doing	11	Impact(s)	4	Community	3
Care/caring	10	Volunteer(ism)	4	Service	3
People(s)	7	Place	3	Sustainable	3
Environment(s)	5	Relationships	3	Decisions	3
Space(s)	5	Back	3	Continuum/continue	3
Steward(ship)	5	Part	3		

The word count analysis also shows that organizations place importance on how these people and communities act, with action words "taking/acting/doing," "service," and "decisions" among the items provided most often. Other items frequently mentioned such as "impact(s)," "sustainable," and "continuum/continue" suggest that participants place importance on outcomes. Even the more biophysical ideas were stated in social language. Terms such as "environment(s)," "space(s)," and "place" are often associated with societal use or enjoyment of resources.

Other overarching responses were noted. Overwhelmingly, the respondents spoke of environmental stewardship as a means to social ends, with words such as "people" and "community" among the most frequently used. It also became clear that volunteerism is an important component in environmental stewardship, illustrated by responses such as "voluntary commitment" and "service to the community." While ecological or biophysical conditions are often the basis for initiating an environmental stewardship program, social and individual benefits and motivators were much more commonly mentioned. For example, respondents provided 10 permutations of "care" or "caring" (e.g., "caring for place" and "taking action about the things you care about").

Clustering exercise—

Appendix 2 illustrates how the respondents organized their items, yielding nine cognitive maps displaying participants' perceptions of environmental stewardship. The maps illustrated widely variable levels of detail and complexity, with up to 23 concepts sorted into a variety of structures exhibiting nodes and strings, commonly hierarchical and some with a matrix or circular structure. Each individual or team of respondents articulated a distinctly different meaning of civic environmental stewardship. While participants constructed maps of diverse form and content, their responses generated similar themes; there was a sense of variety within unity.

Participants often struggled to sort their responses into clusters, yet the product was generally a model that was a whole greater than the sum of its parts. For example, the Student Conservation Association representative provided items ranging

from "voluntary commitment" to "how we can collectively sustain ourselves." As shown in appendix 2, when organizing the items, he offered a cohesive definition, describing environmental stewardship as beginning at the individual level, growing out into the community, and becoming a more communal construct.

We note the effectiveness of the 3CM exercise in engaging participants, perhaps serving to elicit thoughtful responses that they may not have otherwise provided. After looking at the large collection of cards in front of him, one interviewee said in disbelief, "Wow. Did I say all of that?" Several groups asked us to share pictures or discussed using the activity within their organization. As we completed one interview, the participant, who had entered the meeting mentioning her overwhelming and frustrating schedule, left energized, stating "It makes me feel like when I go back to my job, I feel like, we're doing this!"

Content Analysis Across All Responses

Our final interpretive analysis of the practitioners' cognitive perceptions culminated in a preliminary conceptual framework for civic environmental stewardship. This framework has implications for both research and program development.

Using respondents' cognitive items and maps as input, we used content analysis to interpret and devise constructs that characterized the response item groupings. Each researcher combined the response cards from all of the interviews and attempted to organize or group them using a nomothetic approach. As a reliability test, we asked a third researcher outside of the project to categorize the same data. We then compared the meta-sort to the individual clusters to determine if the participants grouped items together in similar ways.

The resulting constructs are meta-level interpretations, and directly incorporate the organizational and systemic structures assembled by the respondents in the 3CM mapping activity. Each construct is described below, along with a few examples of associated terms as provided in the interviews. A spatial characterization of the constructs suggests a conceptual framework for civic environmental stewardship in Seattle (fig. 2). The framework, derived from the collective thoughts and actions of long-term and committed practitioners, indicates perceived relationship connectors between the primary and secondary nodes of environmental stewardship.

- **Values**. Stewardship was defined as being motivated by sets of values, including:
  - **Environmental values:** restoration, getting back to true nature, and reducing our impacts on the environment.
  - **Personal ethics:** moral obligation, spirituality, and taking action about things we care about.

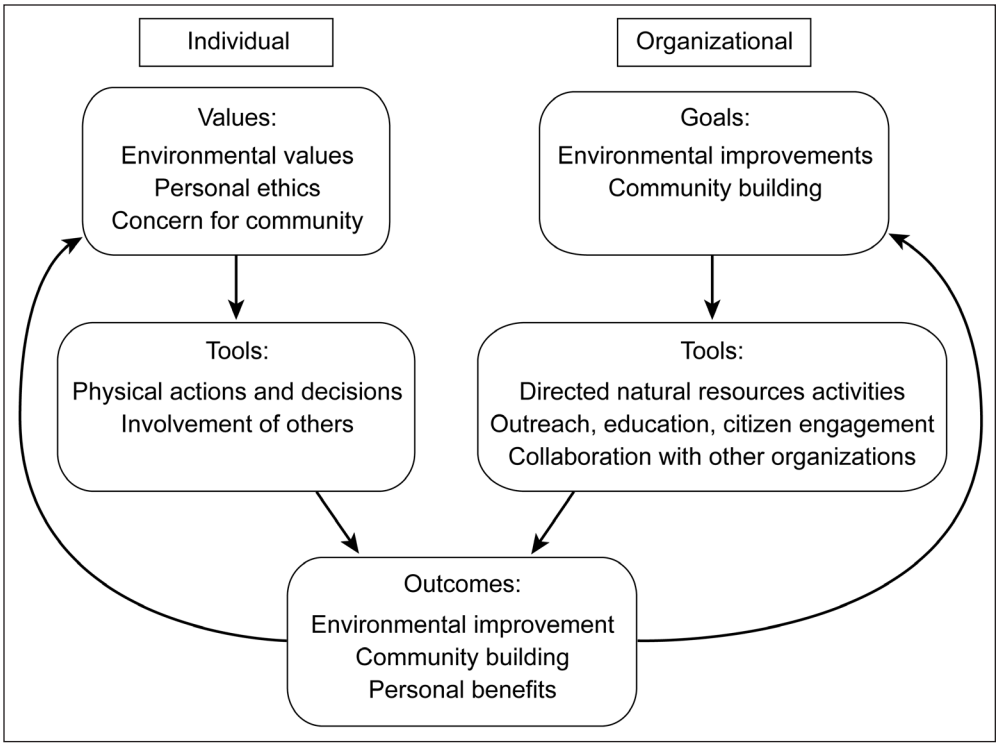


Figure 2—Framework for "environmental stewardship" based on Conceptual Cognitive Content Mapping results from Seattle environmental organizations.

- **Concern for community:** camaraderie, and taking back our neighborhoods (from crime).

- **Behaviors and action**. Tangible, observable behaviors to improve the local environment, including:
  - **Individual actions and decisions:** planting, carrying a reusable mug, and picking up trash on the sidewalk.
  - **Collective actions:** noticing other people's actions and recruiting others to help.

- **Organizational tools**. The participants described strategies that they currently employ within their organizations, plus others that should be implemented to achieve desired outcomes, including:
  - **Directed natural resources programs:** ecologically focused activities, such as organizing tree plantings and invasive species removal.
  - **Outreach, education, and citizen engagement:** advocacy, educating for stewardship, and creating activities to engage everyone.
  - **Collaboration with other organizations:** center of a cooperative, government encouragement and facilitation, and groups considering the efforts of other organizations in addition to their own.

- **Desired and realized outcomes.** Respondents indicated that stewardship activity generates personal benefits for participants and for the individuals within organizations who lead or manage projects. Many noted that activity should also produce outcomes that are greater in scope (in both time and area) than actual work sites and projects.
  - **Environmental improvement:** creating healthy green spaces, and promoting a sustainable balance between built and natural environments within an urban place.
  - **Community building:** opening up to your neighbors, creating a continuum of stewardship behavior, being open to other's ideas, and cultivating the health of relationships.

Results suggest that individuals are motivated by values and that organizations pursue goals.

Respondents conceptualized stewardship at two social scales, the individual level and the organizational level. They generally described individual motivations for stewardship involvement as being more value-based. Specifically, values included environmental ethics, personal ethics, and concern for community. Individuals apply their stewardship values through direct behaviors, actions, and decisions, as well as through the involvement of others. When acting on values, outcomes such as environmental improvement and community building, in addition to personal benefits such as meaning or realization of passion, can be met. Positive outcomes can affirm, then strengthen initial motivations.

Organization-based stewardship was often represented as goal-based, separated into the broad categories of environmental improvement and community building. To reach desired outcomes, organizations use multiple strategies or tools. These include direct collective programs to improve and protect natural resources (such as outreach, education, and citizen engagement) and collaboration with other stewardship organizations, often through networks. There was little description of empirical assessment concerning outcomes. It seems that professional, ad hoc, heuristic assessments of success generate feedback, informing further goals, values, and thus actions.

Discussion

Development of a conceptual framework for civic environmental stewardship included two efforts. First, we screened both professional and empirical writings for definitions, and found extensive references to human dimensions. Interviews were then used in an inductive process to elicit concepts from people having long-term commitments and experience regarding environmental stewardship. The result is an interpretive conceptual framework that begins to specify multidimensional

dynamics of environmental stewardship (fig. 2). It summarizes the collective cognitive structure of expert practitioners and is a valuable first step in assembling (and constructing) theory and questions for future study.

Social Dimensions

Ecosystem recovery includes both human and ecological systems dynamics.

The primary intentions of environmental stewardship in urban landscapes are often described as ecosystems conservation or restoration. For instance, many agencies that sponsor stewardship programs do so to promote ecosystem recovery or restoration, suggesting that ecological theory should be primary in stewardship research. The key informants' feedback addresses that assumption, indicating that future research should integrate biophysical and social sciences to optimize understanding of stewardship program implementation and outcomes. The maps and constructs rendered by 3CM are consistent with empirical literature. The use of environmental stewardship to achieve social goals as explored by Kramer (2007), Westphal (2003), and Svendsen (2009) was a prominent map element in nearly all the 3CM responses.

This section further specifies prior literature that supports and supplements the participants' socially oriented perceptions. We present a range of literature-based social dimensions that were either directly or indirectly invoked by the 3CM maps.

Citizen stewards benefit from nature experiences.

In recent decades, scholars have explored the meaning and functions of the person-nature relationship across many geographies and contexts, moving beyond an earlier focus on the direct utility value of nature. Working for the environment can enhance the livability of one's community owing to improved environmental function, such as air and water quality improvements. There is also extensive evidence of psychosocial co-benefits that may be attained through passive experiences of nearby nature by individuals, including personal restoration and healing (Kaplan 2001, Ulrich 1984), stress and anxiety reduction (Heerwagen 2009, van den Berg et al. 2007) and ecological literacy or a place-based knowledge (Orr 1992).

Social and psychological benefits also extend to the community level as citizens interact within social groups for resource development and management. The relationships that evolve within informal groups can affect both social and environmental conditions. Observed outcomes include empowerment (Westphal 2003), place attachment (Grese et al. 2000, Ryan 2006), social ecology (Grove et al. 1999), community resilience (Svendsen 2009, Tidball and Krasny 2007), ecological democracy (Hester 2006), establishing and improving social ties (Kuo 2003), and developing social learning (Wals and van der Leij 2007).

While regional or national policy may guide stewardship goals, effective management of local natural resources can be achieved through grassroots involvement

Resource actions and governance can build social capital.

(Weber 2000). Research on collaborative natural resources management (Koontz et al. 2004, Ostrom 1990, Wondolleck and Yaffee 2000) suggests that stewardship sometimes takes the form of polycentric governance systems (Andersson and Ostrom 2008, McGinnis 1999), that is, situations in which multiple, diverse institutions and organizations interact in the decision making process to achieve common goals. Community-to-resource interactions can be complex. Processes of collaborative resource management can increase social capital (Mandarano 2009, Schneider et al. 2003, Wagner and Fernandez-Giminez 2008). In turn, organizations can be used as a proxy to assess social capital in communities (Fukuyama 2000, Kramer 2007). Whether source or consequence of organizational dynamics, greater social capital can lead to successful management and improvement of natural resources (Kramer 2007, Pretty and Ward 2001).

Network analysis shows collaborative linkages.

If individual community-based organizations do act to manage natural resources, successful outcomes often depend on collaborations through organizational networks. Social network analysis (SNA) is a method used to understand the linkage networks within social systems that can be focused on different social units ranging from the individual to small groups to organizations. Examples of applications in natural resources include using SNA to categorize and understand stakeholder relationships in resource management (Prell et al. 2009) and evaluation of social capital linkages in collaborative planning efforts (Mandarano 2009). Different network structures (Baldassarri and Diani 2007) appear to influence organizational effectiveness (Provan and Milward 2001).

Effects of stewardship have more often been measured in rural landscapes, where stewardship activity is dispersed on the landscape and cumulative effects of multiple organizations may be negligible (Hajkowicz and Collins 2009). The situation in cities may be quite different; there may be synergistic effects resulting from the polycentric initiatives associated with urban green space. Initial studies of stewardship within urban areas suggest that environmentally targeted activity is a stated purpose, but that social consequences are substantially important to many organizers and participants (Brinkley et al. 2010). Findings suggest that work on behalf of urban natural resources is also an act of social stewardship, that caring for one's neighborhood and community contributes to improved human and social capital. Social outcomes are likely to be at least as important as direct or perceived ecological benefits for motivating individual participation in stewardship, and to build relationships within and among organizations. The Pacific Northwest research program that is building on a stewardship framework will contribute new knowledge about citizen engagement, organizational activity, and organizational collaborative networks.

Future Directions

This preliminary study of groups working in Seattle demonstrates that the widely used concept of "environmental stewardship" is not readily defined by a few words or sentences, and is probably more complex than many would assume. Stewardship organizations are providing essential services, as they respond to identified environmental issues and threats with programs that engage citizens. This most direct purpose is perhaps best understood by the public and public agencies. Yet environmental stewardship goes beyond the biophysical and ecological; organizations also strive to build stronger communities through their stewardship activities.

Figure 2 is a conceptual framework that serves as both result and springboard for ongoing research and dialog among organizations. Knowledge locates a person or organization in time, space, relationships, the world of nature, and the world of "subtle intimations and emotions" (Boulding 1972). Cognitive maps can be used as exograms, or external memories for a group (Sutton 2006), serving as a shared representation that encapsulates understanding of a particular situation at a particular moment in time. This may serve as a reference point for the development of shared perceptions, and a starting point for additional learning. A cognitive map, as artifact representing the thoughts of many, may serve as a shared portable model that can play an important role in the future dynamics of a group or community.

The practitioner interviews generated a framework to guide future research.

The conceptual framework serves as a guide for research on civic environmental stewardship. As mentioned earlier, an organizational network analysis is an important next step, and this study serves to help develop the research instrument. Additional research could include:

1. **Expansion and replication**. The nine groups studied here may not be representative of the population of the hundreds of stewardship organizations known to exist in the Seattle area (Brinkley et al. 2010). The 3CM method is too time-intensive for large-scale sampling, but the concepts revealed in this study can be used as a basis for surveys to determine if perceptions are shared by the broader Seattle environmental stewardship community. Seattle groups may also not be representative of those working in other cities, regionally or nationally. Replicate and comparison studies are important. One replication is planned in Baltimore. Replications help determine the degree to which findings in one place are generalizable to other locations.

   An expansion should address the potentially different conceptualization of stewardship held by advocacy or policy-oriented environmental groups. Our sampling of groups doing "on-the-ground work" was a purposive selection and probably influenced the eventual framework reported here. Additional 3CM inquiry of conservation groups that regard stewardship from functionally different perspectives is also important for research development and theory building.

2. **Compare with rural context**. Our explicit focus was the landscapes and organizations that deliver stewardship programs in urban areas, primarily on public lands. Project sites are intertwined with neighborhoods of mid- to high-density populations and social interactions are an innate dynamic owing to an integrated resource-to-people proximity. Stewardship in rural to wildland areas involves much different ratios of land to human populations, and many stewardship programs are targeted to private property owners (such as family forest owners). Assessment and comparison of concepts of urban and rural stewardship across the urban to rural landscape gradient could provide insights into more effective natural resource management strategies.

3. **Assess the geospatial footprint of stewardship**. While this study explored the conceptual realm, the essence of stewardship programs is the onsite, labor-intensive work to restore, maintain, or conserve urban ecosystems. Interview participants often connected their perceptions and cognitive items to the tangible practicalities of field work. While the key organizations in this study have a general awareness of the work sites of other organizations, there is no comprehensive directory of project locations. A geospatial assessment of all civic environmental stewardship activity within Seattle (or other metropolitan regions) would offer several advantages: (1) to determine the full scope and scale of both environmental and social co-benefits; (2) to determine if stewardship activity focus and density aligns with local government policy and initiatives regarding ecosystem recovery targets; and (3) to improve both efficiency and effectiveness of organizations that work in proximity.

4. **Empirical assessments of social benefits**. A comparable emphasis of social and ecological co-benefits and outcomes was expressed in the practitioner interviews. A cursory literature review indicated potential outcomes across the full array of social scales, from individual to community. Additional research would possibly confirm the perceived benefits, then expand the full extent and importance of such benefits, to both the stewards and the communities where they are active. Better knowledge has both theoretical and practical implications for future planning and management of ecosystems and stewardship programs.

The conceptual framework also serves as a practical guide for stewardship program development. The framework, as shared artifact or representation, discloses the role of social dimensions, from individual to community, in stewardship leadership. Recognizing this undercurrent may help organizations garner more resources for their important work. The demand for stewardship programs is increasing yet fiscal resources lag. Better self-understanding within the stewardship community may initiate greater efficiencies, shared resources, and program funding.

Environmental stewardship generates ecosystem services for participants and communities.

The framework suggests opportunities for extended collaboration with nontraditional partners. While most stewardship organizations typically are built on ecological expertise and affiliations, this study expands the understanding of stewardship public services to include community-building and neighborhood dynamics, such as security. It may be possible to recruit nontraditional organizational partners whose primary purpose is human services to aid with urban ecosystem stewardship. Volunteer recruitment may also be more effective if potential workers come to understand that their nature-based labor brings diverse (and unexpected) rewards.

Finally, as more cities implement sustainability policies, stewardship can be promoted as a key initiative that addresses multiple needs. Once viewed as separate in land base and function, the environment is being increasingly understood as the profoundly important source of the ecosystem services that support society. Environmental quality, regarded by many citizens as the responsibility of institutions, can only be attained through citizen engagement and positive human agency. Our conceptual framework contributes to greater understanding of the potential socioeconomic value that urban nature provides. While people may readily understand more traditionally conceived landscape functions of air and water quality, wildlife habitat, and food production, the results of this study suggest that citizens who are actively engaged in land care can enrich the conditions of their communities through both social and environmental benefits. Ecosystems are multitasking. Public leaders and policymakers may begin to perceive that stewardship is not merely an activity dedicated to landscape management, but that it builds social capacity for community benefit in many ways.

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Appendix 1: List of Interview Rapid Response Items by Organization

Cascade Land Conservancy (now Forterra)	Earthcorps	Mountains to Sound Greenway Trust	People for Puget Sound	Student Conservation Association
Public space	Volunteering	Pragmatism	Mindset	Cultivating volunteerism
Backyard	Service	Avoid "not in my backyard" ism	Getting others to help	Voluntary commitment
Outreach	Creating activities that engage everyone	Center of cooperative	Reducing your impacts on the environment	Humans are part of the environment
Relationships	Working	Actions	Walking the talk	Starts with self
Education for stewardship	Planting	Trees and forests	Taking action about things you care about	How we can collectively sustain ourselves
Getting people to care for a resource	Adopt a ____	Reusable mug	Leaving a place better than you found it	Grows out into community
Natural thing	Caring	Shade-grown coffee	Taking care of the place where we live	Cultivating health of relationships
Growing thing	Care for the environment	Purchasing decisions	Helping fix what's broken	Relationships and connectivity
Sweeping the sidewalk	Understanding culture and landscape	Biking vs. carpooling	Understand the impact of our everyday lives	Systems and interactive processes
Monitoring	Continuum	Act of being a steward	Continuum	
Caring for place	Engagement	Personal act	Changing your behavior	
Restoration	Creating healthy green spaces	What society needs to do	Consider long-term impacts of decisions	
Connections		Moral obligation		
Values		Wise decisions		
Using stewardship to educate people	Sustainable balance between built and natural environment			
Responsibility		Hiking		
Provides benefits		Redefining "pristine"		
Sidewalk steward				
More than just work				

Friends of Interlaken Park	Friends of Leschi	P-Patch Trust	Seattle Tilth
Pickaxes	Not insular	Communication	Support
Bow-saws	People	Government encouragement	Careful
Machetes	Enriching	Advocates	Thoughtful
Organization	People oriented	Organization	Service
Volunteerism	Building sense of community	Knowledge	Presence
Reliability	We're all part of being stewards	Thoughtful design	Shared
Dedication	Picking up trash	Fundraising	Active
Personable	Ornamental horticulture	Volunteer coordination	Caretaking
Monkey see monkey do	Taking back your space (from crime)	Resources ($)	Caring
Participation	Inter-generational	Continuity	Nurture
Competition	Spiritual	Outreach	Protect
Camaraderie	Opportunities and assets of your surroundings	Inclusion	Promote growth
Weeding	Many forms	Collaboration	Internal value
Pulling	Protecting your own space	Inspire people	Wise use
Something that makes them feel good	Taking back your land (from invasive species)	People	Sustainable
Hauling	Wilderness near home	Appreciation and acknowledgment	Meaningful
Cutting	Promise of wilderness	Conservation	
Pinning down burlap sacks	Getting back to true nature	Organic	
Putting mulch in wheelbarrows	Taking care of the environment	Sustainable and local	
Taking the wheelbarrow to the area	Volunteer service to the community	Passion	
Laying down the cardboard	Opening up to your neighbors	Ongoing	
Learning on the job	Open to others' ideas about taking care of the environment	Commitment	
Crash course learning	Recognize that home impacts public space and vice versa		
Court-appointed groups	One person noticing another's actions		
Passion			
Lifetime work			
Humor			

Appendix 2: Cognitive Maps Responses from Stewardship Practitioners[1]

Personal	Bridge	Communal
Starts with self	Grows out into community	How we can collectively sustain ourselves
Voluntary commitment		Relationships and connectivity
Personal accountability		Systems and interactive processes
Responsibility		Humans are part of the environment
Cultivating voluntary commitment (in others)		Cultivating health of relationships

Actions/physical things	Connections	Conceptual/feelings/outcomes
Restoration	Relationships	Getting people to care
Sweeping sidewalk/sidewalk steward	Educating for stewardship	Caring for place
Natural thing/growing thing		Responsibility
Monitoring		Values
Outreach		More than just work
Backyard		Stewardship for education
Public space		Provides benefits

	Organic	
Organizational resources	**Knowledge**	**People**
Resources	Ongoing	Passion
Fundraising	Sustainable and local	Inspire people
Thoughtful design	Continuity	Volunteer coordination
Organization	Conservation	Appreciation and acknowledgment
Collaboration	Awareness	Commitment
Government encouragement	Belief that it's valuable	Making it part of people's lives
		Inclusion
		Advocates
		Communication

Internal value	External result
Shared	Protect
Careful	Presence
Thoughtful	Promote growth
Caretaking	Sustainable
Nurture	Service
Caring	Support
Meaningful	Wise use
	Active

Active/actions (continuum down list with feedback)
Walking the talk
Getting others to help you
Taking action about the things you care about
Helping fix what's broken
Changing your behavior
Taking care of the place where we live
Reducing your impacts on the environment
Leaving a place better than you found it
Understanding the impact of our daily lives

Personal acts/decisions	What society needs to do
Act of being a steward	Pragmatism
Hiking	Center of cooperative
How do people want to exist	Moral obligation
Reusable mug	Stay away from "not in my backyard" ism
Purchasing decisions	Global vs. local
Shade-grown coffee	Wise decisions
Biking vs. carpooling	Sustainable balance
Redefining "pristine"	Consider long-term impacts
	Practical use of resources

Ladders of experience and understanding

Spiritual/enriching	People/social part	Stewarding mechanics	Taking care of environment
Enriches your life	Protecting your own space	Picking up trash	Recognizing that home impacts public space and public spaces impact home
	Reaching out	Taking back your land (from invasive species)	Taking care of the environment
	Opening up to your neighbors	Opportunities and assets of your surroundings	Getting back to true nature (native plants)
Many forms	Open to other's ideas of taking care of the environment	Ornamental horticulture	Wilderness near home
	One person noticing another's actions	Taking back your space (from crime)	Promise of wilderness
	Not being insular	People-oriented through community centers	
	Intergenerational		
	Volunteer service to community		
We're all part of being stewards	Building sense of community		

Elements	Tasks	Equipment	Youth participants	Recruiting	Effects
Reliability	Cutting	Taking the wheelbarrows to the area	Personable	Organization	Crash-course learning
Dedication	Hauling	Dump on top of the cardboard and burlap sacks	Monkey see monkey do	Outreach	Learning on the job
Humor	Laying down the cardboard	Machetes	Competition	Volunteerism	Lifetime work
Weeding	Pinning down the burlap sacks	Bow-saws	Camaraderie	Something that makes them feel good	Passion
Pulling	Putting the mulch in the wheelbarrows	Pickaxes	Participation	Court-appointed groups	

Continuum (left to right, top to bottom)

Creating activities that engage everyone	Service	Volunteering	
		Planting	Engagement
		Working	Caring
			Care for the environment
	Creating healthy green spaces	"Adopt-a ____"	Understanding culture and landscape

[1] Each table is the response of the individual(s) representing a single organization.

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