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Expanding current definitions of environmental stewardship through organizational mission statement analysis

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Expanding current definitions of environmental stewardship through organizational mission statement analysis

Alyssa S. Thomas ⓘ, Michele Romolini

Abstract In recent years, environmental stewardship has been emphasized as one solution to social-ecological sustainability concerns, especially at the local scale. The Stewardship Mapping and Assessment Project (STEW-MAP) is a national research program developed by the USDA Forest Service that has been implemented at numerous locations in the United States and internationally. This study compared the mission statements of environmental stewardship groups in the Los Angeles River Watershed to previously proposed definitions and frameworks of organizational environmental stewardship to see how well they were reflected. A thematic analysis of the mission statements was also carried out to identify locally important themes and priorities. Results show that, although often consistent, the mission statements do not always reflect existing concepts around environmental stewardship. Additionally, environmental stewardship is not always explicit in the mission statements of organizations that are known to conduct these activities. We suggest that non-traditional groups that engage in stewardship work (i.e., research institutions) as well as groups focused on social issues are overlooked actors in sustainable city goals. A more comprehensive definition of environmental stewardship may be needed to bridge the gap between research and practice.

Keywords Environmental assessment ·
Public participation · Social-ecological systems ·
Sustainability · Urban stewardship

INTRODUCTION

Cities are densely inhabited, lived-in landscapes where the human presence is strongly entwined with biophysical and built infrastructures (Andersson et al. 2014; Pickett et al. 2016). These urban areas are ecosystems with interdependent resources and flows that are no less complex than wildland or forested ecosystems (McHale et al. 2015). It has also become clear that it is no longer feasible, or desirable, to separate the urban environment and the people who reside there (McPhearson et al. 2016a). Increasing urbanization has meant that urban ecosystems are under augmented stress from an array of challenges including climate change, land-use change, pollution, population growth, biodiversity declines, and social inequalities (Stanley et al. 2015; McPhearson et al. 2016b). However, local governments and organizations face resource limitations, and knowledge and technical constraints. This can hamper their capacity to address environmental issues and force cities to search for new approaches (Wolf et al. 2013; Ziervogel 2019). Achieving urban sustainability and resilience thus "takes a network" of public, private, and civil society actors (Newell et al. 2012; Pickett et al. 2016). In recognition of these challenges, in recent years there has been increased discussion on opportunities and solutions, such as environmental stewardship (hereafter refered to as stewardship; Folke et al. 2016).

The concept of stewardship is receiving increased attention in a range of disciplines (Andersson et al. 2014; Mathevet et al. 2018), as practitioners have cited the need for more attention around the importance of both formal and informal actors who act as stewards of local environments (Balvanera et al. 2017; Johnson et al. 2020). In research around social-ecological systems and resilience, place-based stewardship has emerged as a key theme

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(Cockburn et al. 2018) as it can make substantial contributions to maintaining or recovering ecosystem health (Frumkin 2003). Svendsen and Campbell (2008) posit that it is important to explore the nature and nuances of locally based, urban stewardship groups. These organizations operate at a range of scales, from a community garden, to a neighborhood, to a city (e.g., Keep Downey Beautiful), a watershed (e.g., Riverkeeper), and even over multiple regions (e.g., The Nature Conservancy, Sierra Club), and are, thus, composed of both informal and formal groups (Svendsen and Campbell 2008; Westphal et al. 2014).

Stewardship groups often have goals beyond the management and governance of natural resources (Romolini et al. 2012; McMillen et al. 2016) and may simultaneously pursue ecological and social goals (Bennett et al. 2018). Furthermore, even when the primary purpose of a stewardship group is environmental, the motivations may be social or economic in nature (e.g., Wolf et al. 2013) for both the stewardship groups and participants (Kuo 2003; Moskell et al. 2010). A case study from Bangalore, India (Murphy et al. 2019) noted that less affluent communities were concerned they could no longer use the lake water to support their livelihoods (i.e., animal herding) and wash laundry, while middle and upper class neighborhoods were interested in lake restoration in order to provide recreational and cultural activities. In the United States, previous studies (e.g., Svendsen and Campbell 2008; Wolf et al. 2013) have found that community (in a social rather than ecological context) was a common occurrence in mission statements and programs of stewardship groups.

However, although some definitions in current scholarship partly capture this expanded focus, others still focus solely on ecological stewardship (e.g., Bennett et al. 2018; Mathevet et al. 2018). It has also been noted (Cockburn et al. 2019; Turnbull et al. 2020) that the link between the theory and practice of stewardship is incomplete. Thus, the practice of stewardship may be quite different than the conceptualization of stewardship in the literature. This mismatch can be problematic if studies of local stewardship are not examining the full breadth of activities enacted by organizations, or stakeholder engagement does not include the full spectrum of stewardship groups. A definition of environmental stewardship that is too narrow in scope will likely exclude groups; and risks missing or under-representing the views and concerns, which are potentially distinct, of the excluded groups. The consequences of these exclusions could later manifest as unexpected opposition, problems, and/or concerns; threatening the success of the project or research. Furthermore, the exclusion of some groups could lead to an incomplete picture of the stewardship work currently being performed, which could potentially result in duplication of stewardship efforts, a misidentification of gaps and priorities for

stewardship work, and inaccurate measurements of stewardship outcomes. These consequences will not necessarily be recognized until the work has already started.

The goal of this study was to evaluate the mission statements of the stewardship groups working in the Los Angeles (LA) River Watershed. Specifically, our objectives were to (1) determine how well the mission statements reflect previously proposed definitions and frameworks of environmental stewardship and (2) assess whether current definitions of environmental stewardship fully capture the key themes and priorities as reflected in the mission statements.

BACKGROUND

Theoretical framework

As the study of stewardship has advanced, the nature of stewardship has been described and theorized (Johnson et al. 2020). However, only a few studies have provided a definition of environmental stewardship (Bennett et al. 2018); and the concept has taken on a range of meanings by both academics and practitioners (Mathevet et al. 2018; Cockburn et al. 2019). For example, Fisher et al. (2012) define environmental stewards as "civic groups that conserve, manage, monitor, advocate for, and educate about a wide range of quality of life issues in urban areas" (p. 28). Meanwhile, Bennett et al. (2018) propose this definition: "Local environmental stewardship is the actions taken by individuals, groups or networks of actors, with various motivations and levels of capacity, to protect, care for or responsibly use the environment in pursuit of environmental and/or social outcomes in diverse social-ecological contexts" (p. 599). In light of the lack of a singular definition, Enqvist et al. (2018) suggested that a review of the effectiveness of different definitions of stewardship might be a valuable study.

STEW-MAP

The Stewardship Mapping and Assessment Project (STEW-MAP) is a national research framework developed by the USDA Forest Service that has been implemented in 18 locations both in the United States (e.g., New York, Chicago, Seattle) and internationally (e.g., Colombia, Dominican Republic, France, and Peru). It seeks to answer the question "Who are the active environmental stewardship groups in my area and where, why, and how are they caring for the land?" (Svendsen et al. 2016). This information is important as "Knowing about the individuals and groups caring for natural resources provides the potential to leverage stewardship capacity in powerful ways for

governments, non-profits, and other organizations to achieve outcomes that would otherwise be impossible with finite resources." Additionally, it can help "to identify active agents of change working in vulnerable communities, to acknowledge the work of informal and grassroots groups, to extend potential partnerships beyond the known knowns; and to identify 'stewardship gaps'—areas that are underserved by active environmental stewardship and engagement" (USDA 2021). As part of this project, the LA River STEW-MAP provides detailed information on the geographical footprint and collaborative relationships of organizations working in the Los Angeles River Watershed.

Since the program's inception in 2007, STEW-MAP researchers have produced a body of scholarship on stewardship, with the project's website listing 21 journal articles, 12 reports and theses, and six book chapters (https://www.nrs.fs.usda.gov/STEW-MAP/pubs/). However, despite the international scale implementation of STEW-MAP research, to date, none of the publications have examined the mission statements beyond a basic word frequency analysis, or a rough examination of the types of work done by the stewardship groups (Svendsen and Campbell 2008).

As the STEW-MAP framework is being applied internationally and across an increasing number of geographic scales and jurisdictions (i.e., city, county, watershed, national forest), a review of the stewardship definition used (as well as other definitions from the literature) is timely to ensure the research accurately reflects ongoing activity. If not, there is the risk that the STEW-MAP approach does not capture the full extent of organizational environmental stewardship, and its relationship to effective natural resources management and urban resilience.

Mission statements

Mission statements are traditionally defined as a written declaration that communicates the purpose of an organization (Bart et al. 2001; Macedo et al. 2016). It serves as a strategic tool, creating shared values, providing direction and purpose, and promoting shared hope and affirming the organization's commitment to survive and grow (Desmidt et al. 2011). A mission statement can also highlight the organizational values of the institution, and can help the organization focus on what really matters (Ireland and Hitt 1992; Desmidt et al. 2011). By distilling an organization's mission into a few sentences or paragraphs, the mission statement is widely accepted as a "bottom line" that should determine organizational priorities (Kirk and Beth Nolan 2010). For non-profits, the mission statement is at their core; it motivates and justifies their existence, attracts and convenes stakeholders, and guides organizational activities (Minkoff and Powell 2006). Finally, mission statements

provide information to the public about organizational activities and the resulting priorities (Fyall et al. 2018).

Mission statements became popular in the early 1980s, and since then, have received considerable attention from managers and academics (Alegre et al. 2018). Given that mission statements are relatively stable (Koch et al. 2015), they provide a good reflection of the priorities and tools used by groups and can assist in identification of the range of actors at different scales. Mission statement analysis has been performed on a variety of topics including hospital approaches to healthcare (Cronin and Bolon 2018), international airlines (Kemp and Dwyer 2003), and Brazilian universities (Deus et al. 2016). More recently, Berbegal-Mirabent et al. (2020) evaluated the relationship between mission statements and performance of science parks.

Study area

Covering 870 miles^2, the LA River Watershed is shaped by the Los Angeles River which extends 51 miles from the Pacific Coast to the Santa Monica Mountains to the Simi Hills, and in the east from the Santa Susana Mountains to the San Gabriel Mountains (Fig. 1; California Water Board 2021). The LA River passes through the Angeles National Forest, multiple state and urban parks, over 43 communities, and is a recreational destination for those $\sim$ 9 million people. Demographically, there are many underserved communities within the watershed with demographic indicators (i.e., poverty, race/ethnicity) much higher than the California average.

Land use in the watershed is 37% residential, 11% industrial, 8% commercial, and 44% open space; although the type of use is not evenly distributed. The lower and middle portions of the LA River Watershed are highly urbanized, while the upper reaches are largely forested areas (LA County Department of Public Works 2021). Increased urbanization and channelization of rivers and creeks have resulted in the loss of most of the original wetlands. Restoration projects aim to reconnect both upland and riparian habitats, and, when possible, recreate wetland areas to encourage the return of wildlife and restore vital ecosystem services. Additionally, stewardship groups working on the LA River hope to balance revitalization with public safety concerns over flooding; as well as reducing the pressures on imported water supplies (California Water Board 2021).

MATERIALS AND METHODS

Survey instrument

The national Office of Management and Budget approved STEW-MAP questionnaire (Svendsen et al. 2016) was used

Fig. 1 Location of the Los Angeles (LA) River Watershed. Reproduced with permission from the Council for Watershed Health

as the starting point for the survey instrument for this study. Questions were discussed and modified during meetings of the LA River STEW-MAP Planning Team, which consisted of up to two representatives from the Loyola Marymount University Center for Urban Resilience (LMU); USDA Forest Service (Angeles National Forest, Region 5: State and Private Forestry, Southwest Research Station); and the Urban Waters Federal Partnership (UWFP)—Los Angeles River. Given the previous use of the questionnaire in multiple cities (Svendsen et al. 2016), and the small number of questions changed, the questionnaire was pre-tested only among members of the planning committee. The revised questionnaire was approved by

Loyola Marymount University's Institutional Review Board.

The final questionnaire (Appendix S1) contained three sections: (1) descriptive characteristics on the groups' organizational structure; (2) geographic data on stewarded sites; and (3) social networks between partner groups that exchange information or secure funding. Data from only the first section are analyzed in the current study, mainly answers to the question "Describe the mission of your group. If you have a formal mission statement, please use that, otherwise use your own words to describe your group's goals." We also present results of some of the organizational characteristics previously reported in

Romolini and Thomas ([2022](#)). These results provide additional context around the stewardship groups working in the LA River Watershed.

Data collection

Development of the LA River STEW-MAP organization list followed the systematic STEW-MAP approach as described in Svendsen et al. ([2016](#)). The LA River STEW-MAP sampling frame used an existing LA County STEW-MAP dataset as a starting point for identifying organizations within the LA River Watershed engaged in stewardship work. In addition, key stewardship groups within the watershed were identified by the planning team, and then approached by the LMU research team with a request for their list of relevant organizational partners and potential data providers in the geographic area. The organizations on those two lists were further investigated through internet research (e.g., dedicated webpages on partners, mentions of project partners) to find additional partners of the responding organizations. Quality checks (i.e., whether the group was still operating, current contact information) were also undertaken at this point. This snowball-sampling method lowers the risk of concentration biases as respondents provide the names of groups they work with, rather than members of the research team finding groups that met the working definition of environmental stewardship. There is still a risk of bias with this method, if the initial group was not representative of a range of stewardship groups, and less connected groups may be under-represented.

The approach yielded an inventory of 535 active stewardship groups in the LA River watershed. The LA River STEW-MAP survey was then distributed via email to these 535 groups. The survey was open from June to October 31 2019, and the research team sent email reminders in the 2nd, 3rd, and final week of October. In addition, there were also a few direct follow-ups in November and December 2019 with groups who had returned only partial responses. Both English and Spanish language versions of the survey were available.

Definitions of environmental stewardship to analyze were taken from the peer-reviewed literature. As a first step, we searched Google Scholar for studies that cited Fisher et al. ([2012](#)), who provided the definition used by STEW-MAP. These studies were first reviewed for relevance (e.g., primary subject was stewardship). They were then read more closely to see if and how the authors defined environmental stewardship, or what framework was provided to define the concept. We also searched the Scopus database for "environmental stewardship" and "stewardship definition" and once again reviewed and read the documents to look for publications that defined stewardship, and then which definition was utilized.

Data analysis

A total of 109 groups responded to the survey, including 96 that answered each aspect of the survey. Ninety five of these groups provided their mission statement and were thus included in this study. We chose not to include non-responding groups as the other questions around organizational characteristics were analyzed for only responding groups as there was no other way to obtain answers to many of the questions. It is also possible that some of the non-responding groups did not have a website. Responses to the questions on organizational characteristics were checked for completeness and accuracy, and then imported into IBM SPSS version 24 (IBM Corp. [2016](#)) for analysis. For the mission statements, the open-ended responses were reformatted into Microsoft Word and then imported into NVivo 1.4.1 (QSR [2021](#)) qualitative data analysis software. All analyses used non-exclusive coding where one mission statement could be coded under more than one theme.

Using NVivo, we compared the selected definitions and frameworks of stewardship to the mission statements of the responding organizations. The first definition was that of Fisher et al. ([2012](#)), used by STEW-MAP, which defines environmental stewards as "civic groups that conserve, manage, monitor, advocate for, and educate about a wide range of quality of life issues in urban areas" (p. 28). Next, we examined the definition offered by Bennett et al. ([2018](#)): "Local environmental stewardship is the actions taken by individuals, groups or networks of actors, with various motivations and levels of capacity, to protect, care for or responsibly use the environment in pursuit of environmental and/or social outcomes in diverse social-ecological contexts" (p. 599).

We then compared the mission statements to two environmental stewardship frameworks. The first was the "framework for environmental stewardship" from Romolini et al. ([2012](#); Fig. 2). Specifically, we used the first two tiers of the organizational framework. The first tier is "goals: environmental improvements and/or community building." The second tier comprises the tools used to achieve these goals: "directed natural resource programs (i.e., ecologically focused activities, such as organizing tree plantings and invasive species removal), outreach/education/citizen engagement, and collaboration with other organizations." We chose to focus on the first two tiers as the third tier, outcomes, is a combination of both individual and organizational pathways. The second framework, by Enqvist et al. ([2018](#)), proposed three different meanings of stewardship: (1) knowledge; (2) care; and (3) agency. Although care is described as an ethical obligation, we took a broader view. Even if a mission statement did not explicitly mention an ethical obligation, we viewed it as
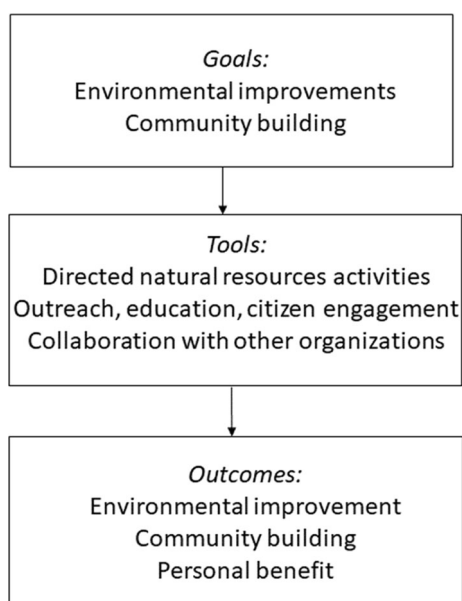
Fig. 2 Framework for organizational stewardship. Adapted from Romolini et al. (2012)

implicit in those that talked about improving and/or caring for humans and/or non-humans.

These comparisons were supplemented by two stand-alone analyses of the mission statements, in order to determine the key themes and priorities for groups working in the Los Angeles River Watershed. First, we carried out a simple word frequency analysis using the website http://www.wordclouds.com, as the site gave more layout options than NVIVO. Next, we carried out a thematic analysis of the LA River mission statements. This analysis was not constrained or based on the above-discussed definitions and frameworks. Instead, it aimed to identify the most frequent ideas present in the mission statements. This was carried out in three stages: (1) identification of the theme(s) presented in each individual mission statements; (2) search for common themes related to stewardship, the LA River Watershed, and social-ecological systems; (3) grouping the more specific themes from stage 1 into the larger thematic categories. The initial coding was carried out by the first author and subsequently reviewed and confirmed by the second author, who also helped define the larger thematic categories.

RESULTS

Organizational characteristics

The full set of organizational characteristics are published in the LA River STEW-MAP report (Romolini and Thomas 2022), but we present a few relevant findings here.

Respondents were asked to identify which of seven stewardship activities their organization carried out in the LA River Watershed. Participate (87%) and educate (82%) were stewardship activities of more than three fourths of the groups; and advocate (64%) was also undertaken by over half the groups. The other four activities had similar levels of engagement: monitor (43%), manage (41%), conserve (41%), and transform (40%). There was wide variation in the primary focus of the groups (Fig. 3), and only three areas of primary focus applied to more than 10% of the groups: (1) environment (26%); (2) education (13%); and (3) water quality/water conservation (11%).

Respondents were also asked what topic(s) their group worked on, with the option to select as many as applicable. The environment was the most common area of focus, with 77% of responding groups reporting they worked on this topic. Education and water quality/water conservation were the other two topic areas above 50% (56% and 55%, respectively). The other topics in the top ten were climate change/climate change adaptation (49%), community improvement/capacity building (47%), urban forestry/tree planting (40%), native species restoration (37%), youth (34%), research in science/technology (30%), and arts, culture, creative practices (22%).

The majority (61%) of the groups were non-profits, and government was the second-most common (17%). All other legal designations were less than 10%: higher education (9%), for-profit (5%), public–private partnership (5%), and "other" (6%). The "other" includes community group, grassroots organization fiscally sponsored by a 501(c), Special District, and Joint Power Authority. The stewardship groups operated across 41 types of sites (Fig. 4), and their primary place of work represented 29 types. The most common primary site types were park (13%), stream/river/canal (12%), vacant land/vacant lot (8%), stormwater management (8%), residential building grounds (7%), and public right of way (7%). Notably, 11% of groups reported they worked on "other" site types, including indoor "sites" such as research, climate, and scientific guidance.

Definitions and frameworks

Fisher et al. (2012)

This definition of stewardship was moderately reflected in the mission statements of the responding groups. Although there was a total of 47 occurrences of the key words (conserve, manage, monitor, advocate, and educate), those instances were in only 38 (40%) of the mission statements. Furthermore, nine mission statements contained at least two of the keywords. The most frequent word was "educate," found in 23% of the mission statements, followed by
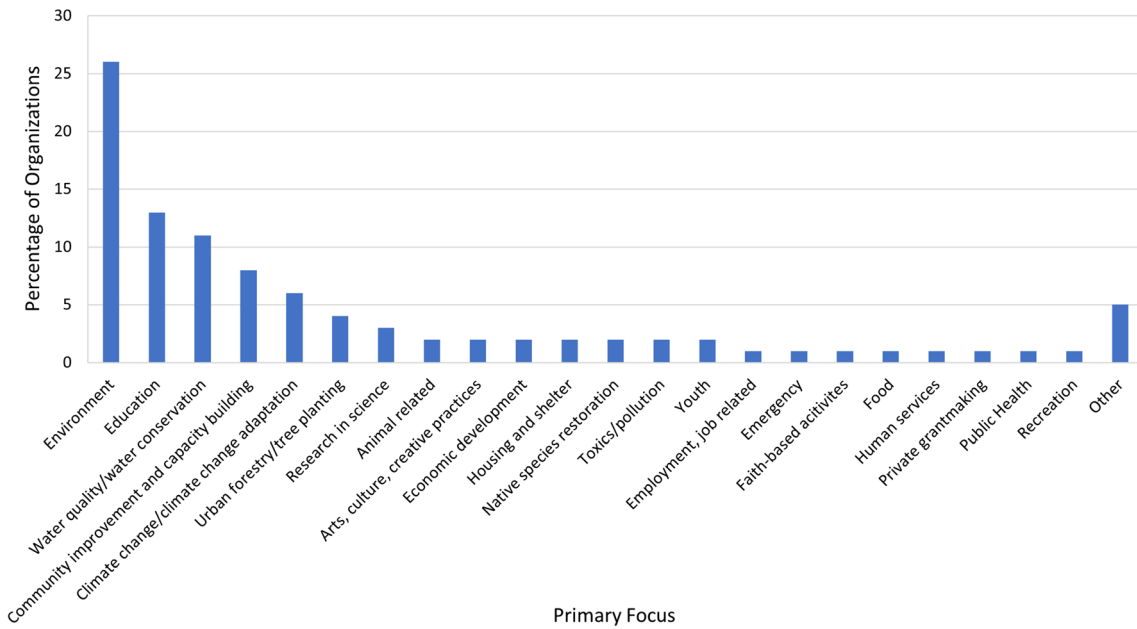
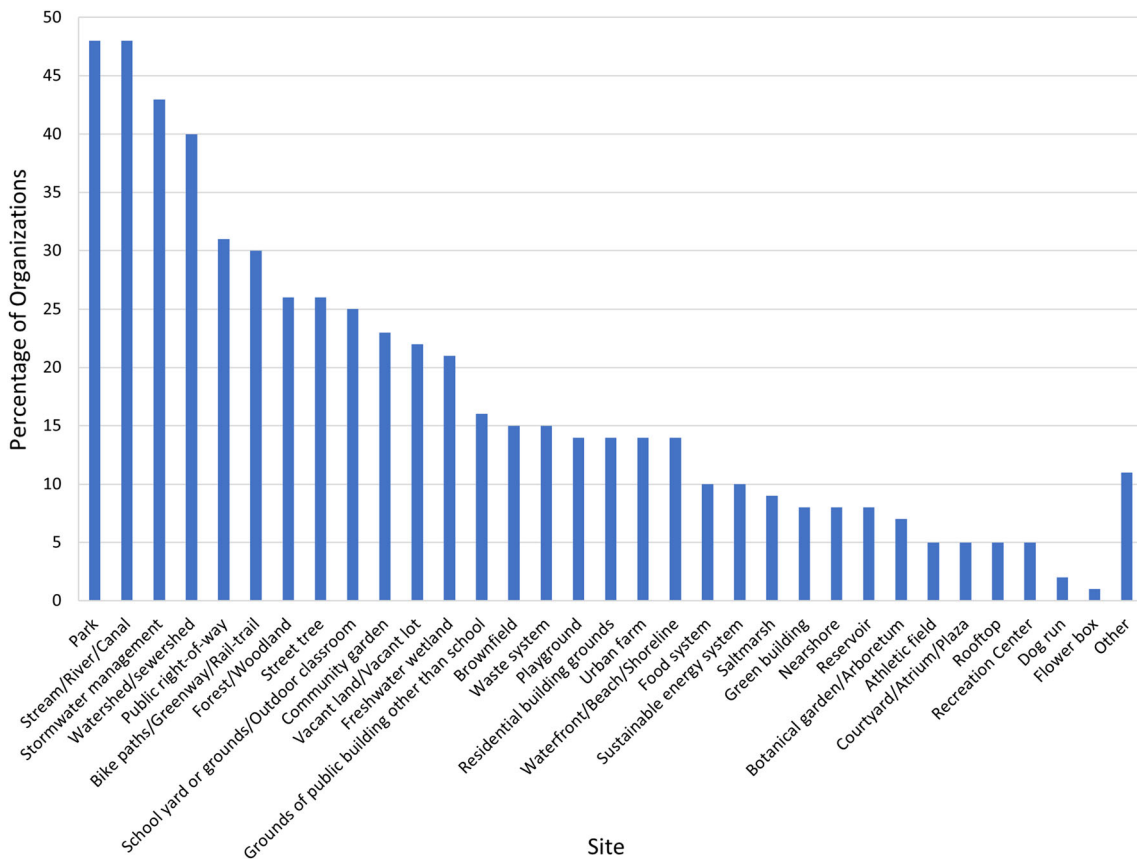**Fig. 3** Primary focus of LA River Watershed stewardship organizations. Adapted from Romolini and Thomas (2022)

Fig. 4 Site types worked on by LA River Watershed stewardship organizations. Adapted from Romolini and Thomas (2022)

"conserve" (18%). "Manage" (6%) and "advocate" (2%) were each mentioned by less than 10% of the organizations. "Monitor" was not found in any of the mission statements.

Bennett et al. (2018)

More than three fourths (84%) of the mission statements were coded under this definition. The outcome of the stewardship action was more frequently included than the role of the organization. Specifically, social outcomes (e.g., "offering learners and communities transformative education in a global context that fosters innovation and inspires social action," 39%) were more common than environmental outcomes ("conservation of the Angeles National Forest," 28%). The mission statements less frequently mentioned the actions of the organization towards the desired outcome. Of the three actions included in the definition, "protect" was the most frequent (15%), such as "protect and enhance America's National Parks for present and future generations." "Care" was almost as frequent (14%), e.g., "inspire people to act toward balance with natural world by rescuing waterbirds in crisis." Finally, "responsibly use" was mentioned in only 10% of the mission statements, e.g., "enjoy, explore, and protect the environment."

Romolini et al. (2012)

Seventy percent of the mission statements contained a reference to their stewardship goal. More specifically, an environmental goal was mentioned in 51% of the statements (e.g., "restore and protect an important urban wetland in our community"), while community building (e.g., "builds community power and leadership for economic justice") was included less than twice as often, at only 19%. In terms of tools, only 31% of the mission statements referred to this aspect of stewardship. Outreach/education/citizen engagement (e.g., "community engagement, education, advocacy, and thought leadership") was the most common one mentioned, by 15% of the organizations. Directed natural resource activities (e.g., "guided bird walks and other activities") was the second most common, at 9%, followed by collaboration with other organizations (7%, e.g., "works in cooperation with the Santa Monica Mountains Conservancy and other local government partners").

Enqvist et al. (2018)

Ninety percent of the mission statements were coded under this framework. Care was a theme in almost half (40%) of the mission statements, e.g., "dedicated to protecting, improving and advocating for all of California's state parks." Agency was almost as frequent (39%); examples included "transforms lives and fosters thriving communities across greater Los Angeles," and "improving underserved communities through the design, construction and preservation of green open spaces." Mission statements coded under knowledge were infrequent (11%) but included "study ecological questions related to the maintenance of biodiversity in a changing world" and "provides reliable, impartial, foundational data and scientific analysis to address water issues facing California today."

Word frequency

A basic analysis of the frequency of words (Fig. 5) showed that "community"/"communities" was the most common word to appear in the mission statements, at 43%. "Educate/education" was next (23%); followed by "protect/protecting" (19%), "people" (18%), "conserve"/"conservation" (18%) and "natural"/"nature" (18%). Other words appearing in more than 10% of the mission statements were "water" (16%), "provides"/"providing" (16%), "improve"/"improvement"/"improving" (12%), and "promote" (12%). Place-based stewardship was also prominently reflected in the word cloud; "Angeles" appeared in 15% of the mission statements and "Los" in 14%.

Thematic analysis

We designated five broad themes and 16 subthemes (Table 1) based on the content of the mission statements. Biological and social aims/outcomes were the most common themes, each occurring in 45% of the mission statements. Biological outcomes included subthemes commonly thought of as environmental stewardship, such as conservation and preservation. In contrast, social outcomes encompassed a range of subthemes around community and associated issues of health, social justice, and civic empowerment. The third most frequent theme was intergenerational, despite in only 16% of the mission statements. The social-ecological subtheme represented place-based stewardship and contained references to public lands (i.e., city parks, national forests, and monuments), and the city of Los Angeles, as well as specific Los Angeles neighborhoods. Finally, cultural motivations for stewardship were uncommon, mentioned in only seven percent of the mission statements. These mission statements noted cultural values and rights of indigenous tribes, as well as the cultural value of recreation (often referenced by governmental organizations).

Fig. 5 Word cloud showing the words most frequently used in LA River Watershed stewardship organizations' mission statements. The larger the font, the more frequently that word occurred in the mission statements

DISCUSSION

Human well-being and ecosystem health are intertwined; with land-use changes, demographic shifts, urban expansion, and environmental degradation directly affecting both (Kalantari 2021). Urban stewardship involves a

combination of larger public agencies operating at the citywide, regional and state-scales along with civil society groups (large formal non-profit organizations and informal community groups), operating in ecological regions, across cities, and in specific neighborhoods (Svendsen and Campbell 2008). We carried out an analysis of the mission statements of 95 stewardship groups that work in the LA River Watershed and found that the STEW-MAP sampling approach identified a diverse set of organizations. Although the mission statements showed moderate to good overlap with the frameworks and definitions from the literature, the analysis highlighted gaps in traditional concepts of stewardship. The overlooked role of community/the social aspect was not without precedent, but our results also pointed to how non-traditional groups (e.g., universities and research institutions) are largely excluded under these established concepts of environmental stewardship; a more novel and unexpected finding.

Non-traditional stewardship groups

It has been noted that an understanding of the different actors involved in stewardship work is a necessary precursor to a better understanding of how and why stewardship is happening (Alexander et al. 2015; Sayles and Baggio 2017). Based on our study results, we suggest that non-traditional groups that engage in stewardship work are an overlooked actor in many ideas about stewardship. For example, colleges and universities were the third most common type of organization but were not well-captured in our analysis. Similarly, 'research in science/technology' was a topic that 30% of the groups reported was part of their work. Although education was included in two of the frameworks and definitions (Fisher et al. 2012; Romolini et al. 2012), organizations that primarily engaged in research activities were largely excluded. Notably, the other framework used for comparison in this article (Enqvist et al. 2018) includes knowledge as one of the three

Table 1 Thematic coding of the Los Angeles River stewardship organizations' mission statements

Theme	Subthemes	Frequency (%)	Illustrative example
Biological aims/ outcomes	Conservation, restoration, sustainable use	45	Restore America's streams, rivers, and wetlands
Social aims/ outcomes	Community, education, health, social justice	45	Lifting people out of homelessness, one person, one family at a time
Intergenerational	Future, youth	16	Jumpstarting green careers for young people that want to change the world
Social-ecological context	Los Angeles, public lands, urban, water	13	Grow a greener future for Los Angeles by engaging Angelenos to plant and care for trees throughout the City
Cultural aims/ outcomes	Cultural resources, indigenous, recreation	7	Build the capacity of Native Nations and Indigenous Peoples to protect sacred lands, waters, and cultures

dimensions of stewardship, noting "… focusing on the underlying information and understanding about a landscape, resource or species population—which is required both for a reasoned deliberation on why stewardship is necessary, as well as assessment of tangible outputs in terms of improved environmental conditions and general sustainability" (p. 25).

Researchers and educators can apply scientific tools and expertise to address social-ecological issues (Saltmarsh et al. 2009). An examination of the mission statements of the educational institutions revealed a commitment to stewardship work. For example, the mission of the UCLA Luskin Center for Innovation is "to unite UCLA scholars with forward-looking civic leaders to solve environmental challenges confronting our community, nation, and world". Muller and Maehr (2000) noted that colleges and universities can potentially have a large influence on natural resource management through the work of their faculty, as well as the student graduates of their institution. Universities can also engage in stewardship by partnering with other groups in order to maximize and leverage the university's reputation by sharing knowledge and resources through outreach, community work, and student volunteer opportunities or internships (Maharramli and Houston 2021). Partnerships between community groups and research institutions can also prove especially effective toward meeting goals in environmental systems and communities where research is necessary to address both social and ecological problems (Jordan et al. 2019). Furthermore, such partnerships also have the added benefit of increasing the capacity of community groups for local stewardship (Jordan et al. 2016; Gray et al. 2017). A failure to acknowledge the role of universities and colleges thus risks losing access to the knowledge and skills they bring to stewardship work.

The presence of non-traditional stewardship groups was also reflected in the answer to the question "In the last year, what sites has your group's stewardship work focused on". Several research institutions answered "other"; as the work of some organizations was not performed outside, but in offices and labs. It is notable that most of the site options in the STEW-MAP survey are outdoors, with only a couple of indoor options such as grocery store (under food system). The presence of stewardship groups who work indoors also challenges typical views on what is defined as stewardship. Indoor activities can still be stewardship; although the place is not always site-based, and is often larger (i.e., city, watershed, region). However, most of the previous STEW-MAP projects (e.g., Seattle, New York, Baltimore) did not include college or university as a specific answer choice for the question on group type; and Turnbull et al. (2020) did not include off-site research as one of, or in any of their seven types of stewardship actions.

The undervalued social dimension

Many of today's most pressing issues, such as ecological sustainability and social justice, are closely linked (Dearing et al. 2014; Crane et al. 2021); Furthermore, it has been suggested (Brondizio and Tourneau 2016; Hicks et al. 2016) that one reason why ecological and/or sustainability goals are often not met is a failure to acknowledge social justice as equally important, and include the social context of the goal. The importance of integrating the social and ecological dimensions of sustainability is also well-acknowledged in the literature (e.g., Folke et al. 2016; Bennett et al. 2018). Reflecting this, both environmental and social motivations were highly prevalent among the responding organizations. Several mission statements included both ecological and social elements, e.g., "Improve the livability of the DTLA Industrial District through the implementation and maintenance of community-based greening and open space projects…".

Despite this, a recent review of the stewardship literature (Cockburn et al. 2019) found that the most common terms were environmental: conserv-(conserve, conservation, conservancy); environment-(environment, environmental, environmentally), biodiverse, sustain, ecosystem, ecosystem services, resilien-, and then finally social-ecological/socio-ecological. There is thus a clear contrast between the stewardship literature and the mission statements of LA River Watershed organizations. It appears that much of the literature, which still focuses on ecological stewardship, is somewhat outdated and has not fully embraced a social-ecological view of stewardship.

There is also a growing body of literature that explores how social issues and associated stewardship work (e.g., education, community capacity building) can help communities improve their sustainability (Moskell et al. 2010; Levine 2011). Although environmental reasons are still important, they often serve as a secondary motivation to other motivations such as building community, and personal and social issues (Ryan et al. 2001; Asah and Blahna 2013). McMillen et al. (2016) noted that although many stewardship groups worked on environmental issues and in the natural environment, others focus on more general quality of life issues. Stewardship groups are, thus, often concerned about a broad range of social-ecological topics.

Conducting stewardship activities may also be a way for individuals or organizations to build community. For example, Sanecka et al. (2020) found that many participants in Warsaw, Poland engaged in green area stewardship to belong to a community. In our study, nearly half of the LA River STEW-MAP survey respondents identified "community improvement and capacity building" as a focus area of their organizational activities. *Communities of practice* form around certain domains and can provide an

opportunity for sharing and developing knowledge (Snyder and Wenger 2010). In the LA River Watershed, there exist formal partnerships captured by the STEW-MAP methodology such as the Los Angeles River Urban Waters Federal Partnership and the Alliance of River Communities. Further data analysis and follow-up research could uncover communities of practice that are less formalized but still consequential in LA River stewardship. For example, Tidball et al. (2010) examined self-organized stewardship communities of practice in post-disaster New York City and New Orleans and proposed that these communities may play a role in social-ecological resilience. These dual motivations are reflected in the number of mission statements that primarily focus on social issues (i.e., improving the quality of life in a neighborhood or improving the health of citizens) that have the potential to make important contributions to ecological outcomes and the sustainability of the city.

Therefore, community can serve as an important motivation for people to engage in stewardship (Asah and Blahna 2013), and emphasizing the community aspect of stewardship could serve to increase public involvement by motivating more individuals to volunteer for such groups. Disregarding the social aspects of environmental issues also risks under-utilizing stewardship groups with a more social focus, as well as doubling up and/or not maximizing volunteer effort. Groups working on environmental outcomes should, thus, consider collaborating with organizations that prioritize social aims. For example, Asah and Blahna (2013) suggest reaching out to more social and community focused groups like churches and neighborhood associations.

Risks of narrowly defining stewardship

STEW-MAP research continues to contribute to the field of environmental stewardship theory and practice on a range of related topics. Furthermore, the research-based applications of STEW-MAP are intended to facilitate stewardship organizations and networks in conducting their work more effectively. Thus, it is critical that the methodology of the research, including the definition of stewardship, can fully capture the breadth of activities, sites, missions, and types of organizations conducting these activities.

Our study uncovered several areas where respondents' mission statements were not fully reflected in the scholarly definitions of stewardship. There may also be other missing components of stewardship in the mission statements of two important groups: identified non-respondents (those that were included in the STEW-MAP inventory but did not participate in the survey) and unidentified organizations (those that were not found in the initial inventory). Perhaps the very name of the project itself is problematic. For

example, it may be possible that organizations with social missions choose not to respond to the survey because they do not see themselves as conducting environmental stewardship, despite the broad definition supplied. This may be particularly challenging in locations with narrow stewardship definitions; for example, in South Africa, where the primary understanding of stewardship is biodiversity protection (Barendse et al. 2016).

The STEW-MAP protocol is constantly being refined, with new locations modifying the survey and methods to reflect their local geographic, environmental, and social contexts. Our study results suggest further refinement to the general survey may be warranted. This is a unique and reflexive opportunity for iterative framing and re-framing of stewardship using a maturing protocol that is actively being utilized and tested at an international scale.

CONCLUSION

Cities continue to expand in both size and number, making it increasingly challenging to sustain the quality of life for their inhabitants along with the conservation of vital ecosystem services and biodiversity (Haase et al. 2014). Place-based stewardship has the potential to help address this problem through meeting environmental, economic and social goals, and creating more sustainable cities and ecosystems, although it will require new and more integrative approaches (Crane et al. 2021).

The STEW-MAP approach is a way to identify stewardship groups who may not fit pre-conceived ideas of stewardship, and management agencies could find it helpful for processes when stakeholders need to be identified and involved. For example, the approach could be used during the scoping process for environmental impact assessments. Similarly, management agencies might find it useful for completing a stakeholder analysis or identifying partners for projects. Once identified through STEW-MAP, stewardship networks can be activated in periods of crisis, such as a natural disaster or pandemic, to support both environmental and community health and well-being. The snowball-sampling method helps remove potential biases from established notions of stewardship, and results in the identification of a more diverse range of groups who are undertaking stewardship activities. However, the site choices are still not reflective of some non-traditional groups, leaving room for improvement.

Our results suggest that working concepts of, and approaches to, stewardship could be re-evaluated to better meet the dual challenges of sustainability and social justice. Current notions of stewardship mean that land managers risk overlooking and/or excluding certain types of groups, jeopardizing intended outcomes, and potentially

resulting in a failure to meet goals. We also recommend embracing the concept of social-ecological stewardship to better reflect the wide range of organizations engaged in stewardship work and the interwoven nature of the two dimensions. Finally, we note that discussions about social-ecological resilience should acknowledge the important contribution of stewardship groups through their role in community-building. A more comprehensive and commonly accepted definition of stewardship is, therefore, important to the advancement of theories, methods, and applications of this still nascent field of study.

Declarations

Conflict of interest The authors declare that there is no conflict of interest.

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