



Self-Reported Effects of the Covid-19 Pandemic on Stewardship Organizations and Their Activities in Southeast New England, USA

Casey Merkle¹, Bryce DuBois^{1*}, Jesse S. Sayles², Lynn Carlson³, H. Curt Spalding³, Ben Myers³ and Shreya Kaipa¹

¹ Liberal Arts Division, Rhode Island School of Design, Providence, RI, United States, ² ORISE Fellowship Program at the U.S. Environmental Protection Agency, Office of Research and Development, Center for Environmental Measurement and Modeling, Atlantic Coastal Environmental Sciences Division, Narragansett, RI, United States, ³ Institute at Brown for Environment and Society, Brown University, Providence, RI, United States

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Resources, United States

*Correspondence:

Bryce DuBois
bdubois@risd.edu

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In many communities, regions, or landscapes, there are numerous environmental groups working across different sectors and creating stewardship networks that shape the environment and the benefits people derive from it. The make-up of these networks can vary, but generally include organizations of different sizes and capacities. As the Covid-19 pandemic (2020 to the present) shuts down businesses and nonprofits, catalyzes new initiatives, and generally alters the day-to-day professional and personal lives, it is logical to assume that these stewardship networks and their environmental work are impacted; exactly how, is unknown. In this study, we analyze the self-reported effects of the Covid-19 pandemic on stewardship groups working in southeast New England, USA. Stewardship organizations were surveyed from November 2020 to April 2021 and asked, among other questions, “How is Covid-19 affecting your organization?” We analyzed responses using several qualitative coding approaches. Our analysis revealed group-level impacts including changes in group capacity, challenges in managing access to public green spaces, and altered forms of volunteer engagement. These results provide insights into the varied effects of the Covid-19 pandemic and government responses such as stay-at-home orders and social distancing policies on stewardship that can inform the development of programs to reduce negative outcomes and enhance emerging capacities and innovations.

Keywords: environmental stewardship, Covid-19, environmental governance, resilience, public space

INTRODUCTION

The Covid-19 virus was identified in Wuhan, China, in December 2019 (CDC, 2021). In the months to follow, life was altered as entire countries went into lockdown to contain and slow the spread of Covid-19. Various approaches were taken including physical or social distancing from other people in both indoor and outdoor settings, working from home, and closure of various businesses and public and private spaces (CDC, 2021). In response to Covid-19, physical interaction decreased.

In times of crises and disturbance, environmental stewardship groups, in this case, predominantly civic and non-profit groups that make claims to specific places and engage in acts of caretaking of air, land, and waters (Svendsen and Campbell, 2008; Campbell et al., 2021), emerge and shift as communities cope with changing social-ecological dynamics (Svendsen, 2010). Examples of such adaptations in practices include making gardens during wartime (Helphand, 2006), the creation of living memorials following the 9/11 attacks on the World Trade Center in New York City (Tidball et al., 2010), and new tree planting efforts following hurricane Katrina (Tidball and Stedman, 2013). The act of responding to these crises, drawing on memories and social relations (Tidball et al., 2010), in turn creates a feedback that supports community resilience (Masten and Obradovic, 2008; Gunderson, 2010; Tidball and Krasny, 2013). While sometimes considered less visible, and more ephemeral, than government-led environmental efforts (Campbell et al., 2021), the direct management, advocacy, education, collaboration, and contestation carried out by environmental stewardship groups are a key component of modern environmental governance and resulting social and environmental outcomes (Connolly et al., 2013; Campbell et al., 2021). The Covid-19 pandemic is a public health crisis that may have impacted environmental stewardship groups and shifted their work; we seek to understand how.

In this brief research report, defined by *Frontiers in Sustainable Cities* as succinctly presenting original research, including preliminary results, we begin to address how the Covid-19 pandemic has impacted environmental stewardship groups, focusing on a case study in southeast New England, USA. We qualitatively analyze 111 responses to the open-ended question: “How has Covid-19 impacted your organization?” which was asked as a part of a larger survey to document and understand stewardship organizations working in the region. Our research is a preliminary step that lays a foundation for future research on the effects of the Covid-19 pandemic on environmental stewardship.

When selecting groups to survey, we included the full diversity of groups that make communities and their environment healthy and safe places. This includes groups who work to conserve; manage; monitor; transform; care for specific living things; build partnerships; engage in place-based traditional gathering of resources for consumption; fund or provide in-kind material support; educate; and advocate for the environment. In essence, this forms a stewardship network connected by organizations working at various local and regional levels (Bixler et al., 2016; Bodin, 2017). This network manages ecosystem services, protects human and ecosystem health, and educates broader publics about their environments. It comprises various combinations and dynamic relationships between individual, civic groups, state, and business actors (Svendsen, 2010).

The Covid-19 pandemic may impact such a network in several ways. Stewardship organizations are composed of individual people, both professional and volunteer (Svendsen, 2010), that are often personally motivated to do stewardship (Tidball, 2012; Bennett et al., 2020). Changes in people’s capacities as they work from home, or in their emotional state in response to a major public health crisis, likely affects their stewardship

practice (Alagona et al., 2020; Ammar et al., 2020). Organizations themselves may also be impacted (e.g., loss of income or shutting down). Networks are relational, thus impacts to one organization may impact others as stewardship processes and outcomes often result (or emerge) from these interactions (Janssen et al., 2006; Bodin and Crona, 2009; Bodin and Prell, 2011). For example, multiple groups may work across land and sea resulting in a coordinated ecosystem-wide response to environmental problems (Pittman and Armitage, 2017; Sayles and Baggio, 2017a). We consider a spectrum of impacts ranging from effects on individuals and their motivations, to organizational capacity and function, to larger interagency interactions within the region.

Our research is consistent with other assessments of Covid-19 that look at the pandemic’s impacts on networks at multiple levels, from individual to structural (Bennett et al., 2020; Lambert et al., 2020). Responses are also likely to be varied. A certain sense of “getting back to normal” is desirable (Quay et al., 2020); for example, bird watching with friends. Covid-19, however, may present opportunities to reimagine and transform many aspects of stewardship, such as education (Quay et al., 2020), government support (Bennett et al., 2020), vibrant public spaces (Honey-Roses et al., 2020; Low and Smart, 2020) and the pace and direction of society’s impact (Wells et al., 2020) on southeast New England.

Current Case

Southeast New England includes three economically, socially, and ecologically important estuary watersheds (Narragansett Bay, Buzzards Bay, Cape Cod and adjacent islands), spanning the states of Rhode Island and Massachusetts, USA [Figure 1, (EPA, 2021b)]. While several local, state, and federally supported watershed management programs have existed since the late 20th century, many of the region’s stakeholders recognized the potential benefits of a broader regional funding and coordination framework. In response, the US Congress established the Southeast New England Program (SNEP) in 2012, an interagency group effort to respond to deteriorating conditions in southeastern New England estuaries that would be administered by the US Environmental Protection Agency (EPA, 2021b).

The SNEP program consists of several committees and subcommittees with representatives from federal, state, tribal, and local governments, non-governmental organizations (NGOs), and regional planning associations (EPA, 2021b). Committees guide the program’s allocation of funding through several grant programs as well as the SNEP Network (a collaborative of 17 partner entities, see Appendix A2 for details) that provides direct technical assistance, trainings, and capacity building activities to the region’s 133 municipalities (located wholly or partially within the SNEP watershed boundary; 94 in MA and 39 in RI), tribes (three federally recognized and four non-federally recognized) and numerous NGOs.

These stakeholders work across a diverse land and seascape. The region is a patchwork of forested, agricultural, and urban lands, plus estuaries, rivers, and coastal shores. Eelgrass, saltmarsh, and floodplain areas weave into the region, providing critical storm and flood protection. Conserving and restoring

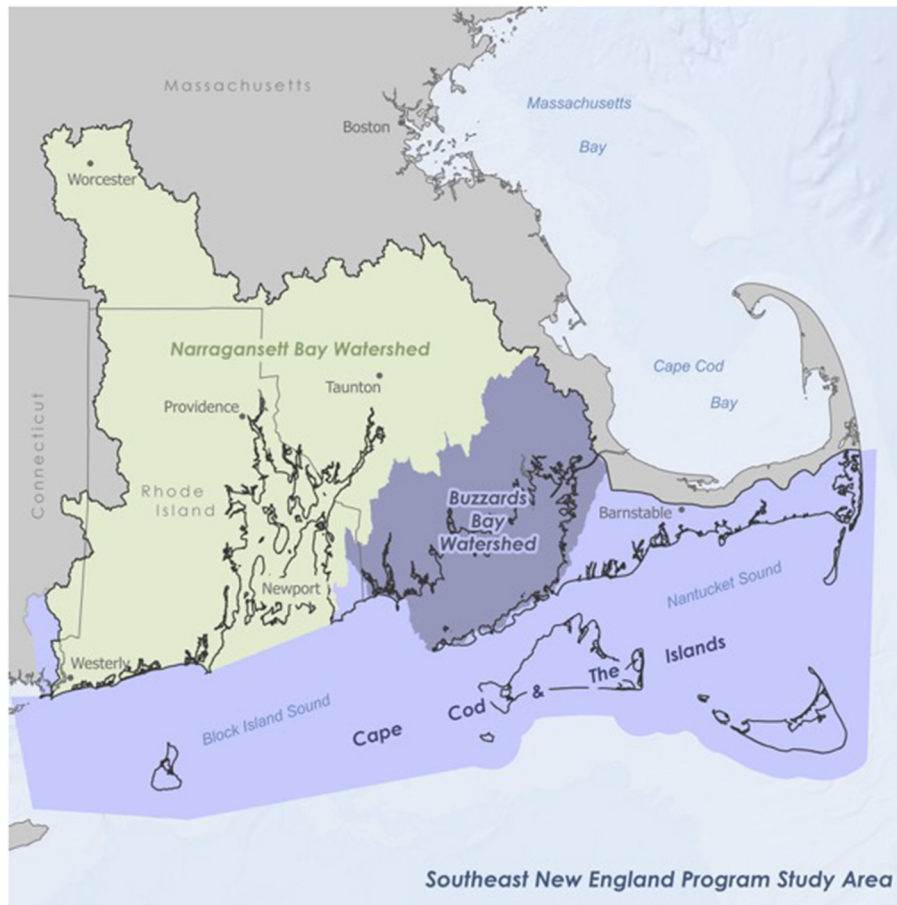


FIGURE 1 | Study area map of the SNEP region showing the three major estuary watersheds (Narragansett Bay, Buzzards Bay, Cape Cod and adjacent Islands), spanning parts of the states of Rhode Island and Massachusetts, USA. Data Sources: ESRI, Inc., USGS, and SNEP.

those habitats, along with generating new green infrastructure to manage stormwater and non-point source pollution, are important issues for many of the region's stakeholders and SNEP (EPA, 2021b).

The SNEP region has a population of about 2,558,732 people, 74.8% who identify as white non-hispanic, 11.5% who identify as Hispanic non-white, and 6.1% who identify as Black/African American (ESRI, 2021). Household median income is \$63,912 [mean \$66,208, interquartile range = \$44,451 - \$84,324; (ESRI, 2021)]. The region includes both rural and urban land, working farms, aquaculture, a large fishing industry, several universities and colleges, and the state capital of RI. Three federally recognized tribes [the Narragansett Indian Tribe, the Mashpee Wampanoag Tribe, and the Wampanoag Tribe of Gay Head (Aquinnah) of Massachusetts] and four non-federally recognized tribes (the Nipmuc Nation, Pokanoket Nation Manissee Tribe and the Eastern Pequot Tribal Nation) have a presence in the SNEP region. There are also a number of communities of environmental justice (EJ) concern (EPA, 2021a), which have a disproportionate burden of environmental impacts and often lack access to many of nature's benefits. Communities with

EJ concerns have often been historically underrepresented in environmental decision making processes (Bullard, 1993). The EPA identifies EJ communities of concern at the neighborhood level and there are EJ communities in most of the the region's cities including, but not limited to, Providence, Central Falls, Narragansett, Newport, Warwick, East Providence, Worcester, Brockton, Fall River, New Bedford and Taunton. Supporting and building partnerships with communities to address EJ concerns is an important priority of SNEP (EPA, 2021b) and is detailed in its five year Strategic Plan.

The research reported here was developed as a project supported by the SNEP Network. This survey had been planned before the Covid-19 pandemic began, but we used the opportunity to add a question related to Covid-19 (see methods). The survey was launched in November 2020, nine months after a state of emergency was declared in the region which shutdown local businesses, non-profits, and governmental agencies. Sampling for this paper's analysis concluded in April 2021 while mandates were rapidly changing from recent developments in vaccination dissemination. This study investigates the varied impacts of the Covid-19 pandemic as

organizations were in the midst of the pandemic, and thus it is not a conclusive review of the impacts, but rather a snapshot of the issues within the first year of the pandemic.

METHODS

Participants and Sample

We collected data using the Stewardship Mapping and Assessment Project (STEW-MAP) methodology (USDA, 2021), which uses a standardized survey to (1) document stewardship organizations' activities, staff and volunteer capacity, funding, and similar attributes, (2) map where they work, and (3) record the social and funding networks that support them. As mentioned, this report analyzes responses to the open-ended question, "How is Covid-19 affecting your organization?" which we added to the survey.

Survey participants were recruited through snowball sampling, wherein an initial set of organizations ($n = 390$), was compiled from environmental coalition websites and SNEP Network partner outreach lists. We sought responses from individuals who were best suited to answer questions about the group. Following the initial data collection phase, we engaged in two additional rounds of survey recruitment to contact any new groups that were named in the network questions (see **Appendix A3** for details).

In total, we contacted 718 groups out of which we had 134 responses to the survey (only one response per group). While responses represent approximately 20% of the initial list, this does not represent a survey response rate. Our sampling relied on groups to self-identify as doing stewardship in the SNEP region based on a broad definition of stewardship (see **Appendix A3**). Several groups declined because they did not consider that they were doing stewardship work or were excluded because they did not work in the region (but may have been listed as an information provider in the network questions, for example). Among respondents, 125 provided answers to the Covid-19 impacts question. We removed fourteen responses that fell outside our research focus for this paper (see **Appendix A3**) for a final dataset of 111 groups.

Our survey focused on civic organizations such as non-profits (86% of responses; details in **Appendix A1, Table A1**), school and community groups, and quasi-government agencies, as such groups often represent unknown stewardship actors (Fisher et al., 2012). In contrast, municipal, state, and federal agencies are well documented. In addition to the focus on the aforementioned civic groups, we also invited the region's tribes to participate because of their active stewardship commitment and history and in order to be consistent with the SNEP Program's five year strategic plan goals and the mission of the SNEP Network. Our data includes one response from a Tribal government that responded before we downloaded responses in preparation for this journal special feature. Taken together, because of the respondents who completed the survey in time for analysis for this special issue, our results predominantly reflect non-profit and citizen groups and may not be generalizable to other kinds of groups.

The majority of respondents identified conservation work as their primary focus (**Table 1**); education, advocacy, and

management followed closely behind. The most common "sites" where groups worked were conservation lands, protected properties, and/or open spaces (32%), followed by watersheds (15%). **Appendix A1, Table A2** provides a complete list. While groups worked on properties under a variety of ownerships, about one quarter only worked on lands they owned (**Appendix A1, Table A3**).

Coding and Analysis

We used thematic, process, and causation coding to analyze a single open ended survey question. Additional descriptive statistics about where groups work and their stewardship focus are included in the **Appendix**. Responses were open-coded (Saldaña, 2013) by the first author, who read through all responses to create an initial set of codes and themes, which were then reviewed and discussed by the first three authors. Several rounds of thematic coding were done, until agreement between the three first authors was reached regarding the accuracy and saturation.

Coding was based on categorical domains and subdomains that emerged in an iterative coding process, focused on impacts of the Covid-19 pandemic. We also assigned a value attribute to all codes to account for the kind of impacts reported (i.e., positive, negative, or neutral/unstated). We then coded for a sense of agency where organizations expressed that they had an ability to actively address or respond to the described impact (i.e., no agency, could not assess, or have agency). Finally, causation and process coding (Saldaña, 2013) were utilized to understand what groups attributed the cause of the impact to, and where a group changed their stewardship processes. See **Tables 2, 3** and **Appendix A3, Table A4** for names of specific codes, which are presented along with the tabular coded results.

RESULTS

Nearly all groups ($n = 99$) mentioned a process change or adaptation to how they were going about engaging in stewardship (see **Appendix A3, Table A3** for more information) and these themes are embedded within the impacts theme sections. A smaller portion ($n = 35$) made explicit reference to the causes of these impacts, which are reported in a final causation section.

Capacity

Sixty-three groups described how various aspects of their organizational capacity were impacted by Covid-19 ($n = 63$; **Table 2**). Capacity impacts were primarily neutral ($n = 28$) or negative ($n = 33$), though two groups described positive impacts in the form of increased funding and new opportunities created through remote work. Internal collaboration was the most common impact, primarily through staff transitions from in-person to remote work or implementation of social distancing protocols. For example, a non-profit monitoring group responded: "Most people work from home when possible. Staff and interns that monitor ponds, salt marshes or herring runs work individually in the field and use face coverings and social [distance in the] lab. All meetings are held *via* Zoom."

TABLE 1 | Primary environmental stewardship activities of southeast New England organizations.

Primary stewardship activities	Number of organizations (n = 111)
Conserve or preserve the local environment (e.g., perpetuate cultural values and practices related to stewardship, hold conservation easements, protect water resources, protect open space, etc.)	34
Educate the public about the local environment (e.g., promote cultural values and practices related to stewardship; provide/develop curriculum; conduct research, science, training, outreach)	18
Advocate and/or plan for the local environment (e.g., planning, organizing, direct action, fundraising)	18
Manage or take care of a place in the local environment (e.g., beautify, improve, or restore a garden, trees, yard)	11
Participate in, partner with groups, or support other environmental work	7
Monitor the quality of the local environment (e.g., air or water quality, dumping, species monitoring, citizen science)	5
Restore native habitats, native species, (e.g., remove invasive species, control deer, restore anadromous fish runs), traditional and customary systems and/ or structures (e.g., for ritual, agriculture, water, navigation, aquaculture, trails/travel)	7
Care for specific living things or places in the local environment (e.g., plants or animals, or special cultural sites or places)	5
Fund or provide other in-kind material support	1
Respond to or prepare for disturbances (e.g., hurricane, flood, Covid-19, fire/drought, etc.)	1
Transform local environmental systems (e.g., changing the waste stream; transitioning toward sustainable energy; stormwater management)	2
None of the above	1
Missing	1

TABLE 2 | Self-reported impacts on environmental stewardship organizations.

Domains	Sub-Domains	Descriptions	Instances				Reported Agency
			Negative	Neutral	Positive	Total	
Capacity (n = 63)	Internal Collaborations	Some aspect of internal workflow was affected	7	26	1	34	20
	Budget	Budget was mentioned in response, including reductions in giving, cuts, and/or cancelations of fundraising events.	21	1	2	24	2
	External Collaborations	Working relationship and approach with other organizations have been impacted.	8	12	3	23	8
	Staff	Staff were impacted by shifting responsibilities, staff shortage or office closures. Also, staff hiring and staff cuts or delays in hiring.	8	1	0	9	3
Engagement (n = 78)	Programs	Opportunities for learning, especially youth education opportunities (ten groups), direct stewardship, training, and/or activities.	34	16	0	50	14
	Events	Public events, including recurring and one time.	27	4	1	32	5
	Volunteers	Public volunteer programs were impacted.	28	1	0	29	3
	Visitation	Visitors (non-volunteers) to site/property, either passive or active.	7	7	1	15	4
Direct Stewardship (n = 30)	Policy	Legislative-focused policy work	2	0	0	2	0
	Research/monitoring/ citizen science	Collection of data for restoration projects, fieldwork, species monitoring, land surveying, and including citizen science.	13	3	0	16	3
	Cleanup/Trail maintenance/Trees	Active stewardship activities such as park cleanups, trail maintenance, tree maintenance and other management activities.	17	3	0	20	0

Thematic coding results presented as thematic domains and sub-domains. Sub-domains are not mutually exclusive and thus, the total count of negative, neutral, positive counts, of sub-domains do not necessarily equal the reported counts in column 1 (i.e., domains). The reported agency code documents if organizations expressed that they had an ability to actively address or respond to the described impact (for table legibility, only positive accounts are reported here).

Organizations also reported a range of external collaboration impacts including moving to virtual meetings and reducing or canceling collaborative meetings for many months. One stakeholder non-profit group, for example, described how the

cessation of in-person meetings made it “...challenging to build community and continue momentum in moving projects forward.” However, for many groups this impact was neutral or even positive because remote work created new opportunities.

TABLE 3 | Self-reported causes of impacts on environmental stewardship organizations.

Causation codes	Descriptions	Instances
Social/physical distancing	Described as general issues of social/physical distancing.	11
Guidelines (Federal/State/Local)	Specific restrictions were named and the related federal, state, and local entities that developed them	9
Increased visitation	Described increases in visitors to their sites/stewardship turfs	5
Legislature Delays	Mentioned delays in the legislature due to Covid-19-related regulations	2
Total		35

For example, a watershed-focused non-profit described stronger relationships and an increased ability to accomplish projects in two committees they oversee, which they attributed to virtual meetings.

Beyond collaboration, groups also experienced a range of budgetary impacts that included a reduction in giving, cuts from parent organizations, or reductions in fundraising events. Across these budgetary impacts, groups mentioned little agency in their ability to respond. Several groups expressed fear that reduced public profiles will lead to future donor reductions.

Additional impacts included staff shortages, staff reductions, delayed hiring, cutting part-time or seasonal staff positions, and reducing overall hours. Taken together, organizational capacity was impacted primarily by how people worked together, internally and externally. Fortunately, groups felt they had agency to shift to these new contexts and continue with their work.

Engagement

A large number of participants ($n = 78$; **Table 2**) described impacts to their public engagement activities, including: events, visitation, programs, youth education programs, volunteer events and policy efforts. Most of these impacts were negative ($n = 62$; **Table 2**) or neutral ($n = 15$). The most common impacts were to youth education, direct stewardship, and training programs. While many of these impacts were negative, fourteen groups mentioned having some ability to develop strategies to respond to these impacts. For example, a non-profit described that they altered their educational programs, stating, “In 2020, we did not visit the elementary school to run garden education programs. Instead, we provided virtual lessons...” They also adjusted how they worked in their community gardens: “We were not able to allow the public into some of the community gardens due to rules set forth by the owners of the property. Instead, staff grew vegetables to donate to community members in need.” As a result, programs continued, but lack of property ownership reduced access and opportunities for engagement with participants. Groups also struggled to retain volunteers and struggled with social distancing when working with volunteers.

The most common strategy to adapt engagement efforts was canceling events. The ramifications are likely quite large. One nonprofit described canceling an event where they “...normally work with over 1000 volunteers and connect residents to the Greenway...” canceling events often resulted in negative impacts ($n = 24$), such as reduced fundraising. For example, one nonprofit canceled their largest event which accounts for 25% of their income.

In contrast to canceling such social gatherings, fifteen groups that conserve or manage properties mentioned increased passive and active recreation at their sites. For some groups this was positive, “[there is] more demand for our trails and open spaces. The value of open space has never been more clear to most of our supporters.” But several groups struggled with the increase and one respondent made sure to emphasize this change: “LOTS AND LOTS more recreational traffic! (We are struggling with capacity!) [sic].” In response to these impacts, groups made a number of process changes to their outreach and engagement. For example, education groups reduced programs such as field trips and summer camps.

Finally, many organizations mentioned reductions in the number of volunteers invited or the cancelation of entire events such as cleanups, monitoring, citizen science, and tree plantings, and few groups identified any ability to develop alternative strategies to work with volunteers. Taken together, engagement was overall negatively impacted, and few organizations mentioned having agency to respond other than to cancel or reduce events, an issue due in part to property ownership and access.

Direct Stewardship

A relatively small number of groups ($n = 30$; **Table 2**) mentioned impacts to specific stewardship activities. Those direct stewardship activities that were impacted included research projects, monitoring, citizen science as well as clean ups, trail maintenance, and tree planting and management. Most impacts were described as negative ($n = 26$), and few organizations described having agency to continue their stewardship. Most impacts to direct stewardship activities were due to physical distancing. A number of groups explained that they reduced or eliminated volunteer opportunities but continued with their research and monitoring activities. For example, a water quality monitoring program that had been conducted by volunteers was carried out by staff. Another organization, a watershed monitoring non-profit, described how they changed their approach to working with volunteers by, “Limiting [their] direct contact with [...] volunteers (switched to contact-less equipment/sample exchanges)...” While some groups made shifts in their volunteer engagement, many canceled monitoring or citizen science activities entirely. For example, a non-profit with a main stewardship focus on education said they were, “Unable to use volunteer citizen scientists to test water quality during 2020, reducing the number of ponds tested and the number of actual tests performed.” Taken together, research

and monitoring activities were reduced, while many programs decreased volunteer participation in these same activities.

Causation

While the Covid-19 pandemic impacted every group in this analysis in one way or another, just less than one-third ($n = 35$; **Table 3**) mentioned a specific Covid-19-related cause and its related effect on some aspect of their stewardship activities. The most common causes were local, state, or federal guidelines followed by general social distancing requirements. For example, one conservation non-profit said social distancing did not really hinder their research activities, but it did impact their public engagement: "... [social distancing] has been very challenging; we have not been able to engage with the public or hold group events as much as usual, fundraising has been very challenging..." Contrarily, five groups mentioned that increased visitation rates overwhelmed staff, impacted their ability to host volunteers, and required them to reduce programs "...We had to close one of our most popular preserves," said one conservation nonprofit, "because there were too many people on the trails and cars were parked on the street, potentially blocking emergency vehicles..." These increases in visitation challenged groups in a range of ways given social / physical distancing guidelines. Finally, changes in state legislature proceedings slowed some policy-related activities.

DISCUSSION

Environmental stewardship organizations form a vital social infrastructure network that helps protect and restore the environment, engage citizens to make them aware of nature's importance, and advocate for these benefits in socio-political arenas (Svendsen, 2010). In times of crisis, environmental stewardship provides opportunities to come together and rebuild both the environment and community (Masten and Obradovic, 2008; Gunderson, 2010; Tidball and Krasny, 2013). Understanding how Covid-19 has impacted stewardship groups in the SNEP region may enable the region's stakeholders and decision makers to support various initiatives or develop programs to improve resilience and social justice. The following sections describe each of the main findings of our study, as well as possible management implications and suggested actions.

Capacity and Environmental Governance

Our analysis revealed that changes to capacity occurred within and between environmental stewardship organizations, potentially changing the dynamics of environmental stewardship collaboration in the SNEP region. Groups pulled back from volunteer work and adapted workflows to leverage internal group strengths and work from home, sometimes also reducing part-time and temporary opportunities. However, working from home presents an emotionally challenging and isolating work environment (Alagona et al., 2020; Ammar et al., 2020) that may not be sustainable.

The shift in virtual external collaboration, while not positive for all groups, led to greater participation and ease of access for community-engaged projects and potentially offers an

opportunity to build a more resilient environmental governance structure. As described by Wells et al. (2020), rather than return to "business as usual," there is a possibility to leverage these new forms of work and collaboration. Virtual platforms may promote broader accessibility, more shared work and greater collaboration amongst groups with capacity to work online.

Engagement, Access, and Social Benefits

While many events were canceled or postponed during the pandemic, programs often shifted from in person stewardship to online activities; similar to environmental education groups that adapted teaching, coursework, class time and fieldwork to online environments (Quay et al., 2020). While converting to digital environments may seem successful, concerns and questions remain about the loss of social connections for environmental education in a digitally mediated environment (Quay et al., 2020). Future work should monitor the impacts of this digital transition and help stewardship groups develop capacity and build agency so that they can direct needed changes.

The establishment of new access protocols and regulations that were developed by, and also affected, environmental stewardship organizations raises concern over the potential long-term constraining of public space and is an environmental and social justice issue. Specifically, Low and Smart (2020) argue that broad narratives of the danger of being in contact with infected people and the emphasis of moving public lives online and away from public space may be maintained beyond the pandemic and used to reduce future public space access. Two related access issues were discussed by respondents in our study. One is the decision made by land-owning conservation organizations, to keep open or prohibit public access to their lands. These organizations were challenged by increased visitation rates and also with developing safe and effective social distancing protocols, especially when state-owned lands were shut.

The other issue was loss of access amongst groups who do not own the lands they work on, such as those organizations who work on community gardens on school grounds. In each case, there is a danger of social fragmentation in deciding who is allowed access, use, and care for landscapes both during and following the Covid-19 pandemic. Groups, including the SNEP Network, that are interested in environmental justice should continue to monitor such trends in public space and access, especially where groups lack property ownership, and work with stakeholders to build capacity where and when needed.

Engagement and Nature Contact During and Following Disturbances

While individuals sought sites for socially distanced recreation in nature, many organizations mentioned reductions in their volunteer opportunities and thus an inability to participate in the restoration of loved places, what Tidball (2012) describes as a restorative topophilia. In this process, stewardship activities and engagement are catalyzed by crisis and can develop into a positive feedback, where stewardship activities increase public and government awareness of ecosystem services, resulting in further stewardship engagement. Such processes occurred, for example, in New Orleans post-hurricane Katrina where people

recognized the storm buffering role of urban trees, resulting in a massive increase in tree-planting efforts by community groups and public agencies (Tidball and Krasny, 2013). However, for many groups in the SNEP region, a similar opportunity was deferred during covid because of social distancing protocols that reduced volunteers and public engagement. Whether the increased visitation will lead to future volunteer engagement at these sites; or conversely, that organizations will continue to keep volunteer engagement low, is still unknown. This is yet another area where continued vigilance, capacity building, and creative solutions may be needed to ensure that the region's volunteers can participate, especially in advancing stewardship needs in EJ communities of concern.

Direct Stewardship and Environmental Outcomes

Finally, direct stewardship was also impacted by the pandemic both in terms of reductions in overall practice as well as decreases in research. This included reductions in water testing, environmental cleanups, and urban tree maintenance. Worldwide, volunteers have become increasingly involved in the management and monitoring of natural resources, monitoring species, and conserving protected areas (Conrad and Hilchey, 2011) and interactions among groups in any given network may affect environmental outcomes such as clean ups, tree plantings, and invasive species removal (Romolini et al., 2016). In our study, groups involved with invasive species monitoring programs described cancelations or difficulties with managing volunteers; and water quality monitoring groups reduced their citizen science programs. While groups were successfully able to develop internal collaborative approaches, volunteers are a critical component of the environmental governance of the region. Covid-19 has reduced the scale of that work, leaving future capacity uncertain and potential gaps in citizen science-generated data, which is especially relevant for entities interested in advancing environmental justice.

Next Steps

This paper contributes to growing evidence of the social and environmental impacts of the Covid-19 pandemic. While an important first look at the effects of Covid-19 on the region's stewardship, there are several limitations present in this research that are worth noting. First, our inquiry was limited by the need to fit into the bounds of our existing survey. For next steps, we recommend follow-up interviews with a series of more detailed questions about the impacts of Covid-19 on stewardship. Our current analysis can form a basis for these interview themes and questions. Second, while we sought a comprehensive assessment of all stewardship groups, we recognize that the snowball sampling approach is not necessarily statistically generalizable to all groups or to other regions, and that our sample and results predominantly reflect non-profit and citizen groups. Specifically, we call for research that focuses on how the pandemic has affected groups working in communities of EJ concern in order to understand equity concerns impact the scope of stewardship services a community experiences. Finally, the timescale of the

implications discussed are unknown and while any negative changes are hopefully temporary, the longer-term implications remain unknown. Our work represents an early opportunity to interpret the impacts of the pandemic on a large group of environmental stewardship actors in southeast New England. We are hopeful that the impacts and opportunities identified in this and related contributions in this special issue can support continued resilience and recovery to the pandemic.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Rhode Island IRB. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

CM and JS: data collection, data analysis, and writing. BD: data collection, data analysis, and writing and principal investigator. LC: data collection and figures. HS: data collection and paper edits. SK and BM: data collection and data cleaning. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/frsc.2021.772880/full#supplementary-material>

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