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ACCESS TO NATURE IN NEW HAMPSHIRE:
EQUITY AND QUALITY OF LIFE

BY

CODY G. CRYTZER

Bachelor of Science in Forestry (B.S.F), University of New Hampshire, 2020

THESIS

Submitted to the University of New Hampshire
in Partial Fulfillment of
the Requirements for the Degree of

Master of Science
in
Natural Resources and the Environment

May, 2023

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On April 17th, 2023

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ABSTRACT

Access To Nature In New Hampshire: Equity and Quality of Life

by

Cody G. Crytzer

University of New Hampshire, May, 2023

The primary objectives of this research were to understand what access to nature means for people engaged in the nature economy, economic development, recreation, conservation, and community development sectors of New Hampshire, to identify benefits, barriers and opportunities of access to nature with a focus on underserved communities, and to contribute data and knowledge to inform local, regional, and state efforts to advance equity in environmental protection, justice efforts, and future policy considerations impacting New Hampshire. This research involved qualitative analysis of interviews with statewide policy leaders and stakeholders that work with individuals and organizations closely related to nature economy and nature access. In addition, a case study conducted with the City of Rochester, New Hampshire, focused on a municipal perspective, particularly considering the City's recent efforts to improve access and recreation opportunities.

I found that the New Hampshire natural assets most frequently identified by participants were mountains and water resources, such as lakes and ponds, rivers, the ocean, estuaries and wetlands. Rochester participants most frequently identified the Cocheco River and community trails as City natural assets. Participants were almost evenly divided about whether everyone in New Hampshire has access to nature, but all participants identified barriers to accessing nature. The most frequently mentioned barriers were transportation, knowledge, cost to an individual,

infrastructure, time, and Americans with Disabilities Act (ADA) compliance. About two thirds of participants reported being engaged in organizational efforts to expand access for people identified as having limited access, most frequently through diversity, equity, and inclusion initiatives, expanding recreation opportunities, and making trails more ADA compliant. Almost all participants identified organizational challenges in efforts to expand access to nature, with funding and bandwidth being the most frequently identified challenges.

The findings from this study are already supporting community education efforts to better connect people to nature through co-authored info briefs, a webinar, an in-person panel and walking tour of Rochester, and a presentation to a local conservation commission. The info briefs have been downloaded over 121 times, over 50 people attended the webinar, and 25 people attended the in-person panel and walking tour. These and planned follow up efforts aim to benefit New Hampshire's underserved communities and the State as a whole, through individuals and organizations advocating and making positive changes for communities and environmental justice efforts.

Chapter 1: Introduction

Imagine this scenario: You're stressed, in need of exercise, and want to get outside and enjoy nature. You work multiple jobs to afford the high cost of living for your family with two kids in the New Hampshire (NH) Seacoast region. You finally have some free time and want to go ride your mountain bike on a nearby trail in your community. First, you check Google Maps and confirm the trail is only two miles from your home. You put on your safety gear and start to ride toward the trail. Before long, you encounter a multilane major highway you can't cross safely. You realize you need either public transportation or your car to reach the trail. You don't know of any public transportation that will get you closer to the trail, so you ride back home. As you mount your bike on your car, you are grateful you were able to purchase a bike rack this year. You drive off, excited to finally spend time outside and get some exercise in while you still can. The barriers you encountered in this fictional scenario are real: lack of knowledge of where trails are located and how to get to them safely, lack of public transportation, the need for a private vehicle, bike rack, and associated expenses, and the added time needed to navigate these barriers. Barriers like these prevent many people from accessing nature even when it is located nearby, affect populations with different demographic characteristics differently, and therefore raise environmental justice and equity concerns.

To improve environmental justice while confronting environmental and climate challenges, the United States Environmental Protection Agency (EPA) has called upon EPA Region 1 (New England) to increase efforts and actions to protect human health and the environment for Americans who have been historically marginalized, overburdened, underserved, and struggling with the legacy of structural racism (EPA, 2021). This research follows policy documents in defining underserved communities predominantly as communities

with higher percentages of people of color, indigenous people, and/or low-income individuals (EPA, 2021), and recognizes a more comprehensive definition may be needed depending on the specific community. EPA Region 1 has developed a plan for outreach, engagement, and investment within underserved communities, which focuses primarily on working with external partners for community engagement to improve environmental and health conditions and mitigate risks (EPA, 2021). In addition, the United States Department of Agriculture (USDA) has explicitly identified rural populations as at risk for environmental and human health harm (Pellow, 2016). Some risks facing underserved communities include flooding caused by extreme precipitation events, water quality issues caused by contaminants such as arsenic, and barriers preventing access to nature (NH CRHC, 2016; Peters et al., 1999; Bratman et al., 2015). Access to nature impacts the economic health of a community, the mental health and physical health of individuals, as well as the ecological resilience of the community (Rogers & Garlick, 2021; Bratman et al., 2015; SEP, 2012). As 39.7% of New Hampshire's population is classified as living in rural areas and 7% of the State's population is identified as living under the poverty line, an important question is whether and how these populations are disproportionately impacted by barriers to accessing nature (Iowa State, n.d.; U.S. Census Bureau, 2021b).

Therefore, this research aimed to understand barriers and opportunities of nature access through key informant interviews with organizations that serve New Hampshire communities. The findings can contribute to EPA's strategic plan of addressing climate change and advancing environmental justice and equity within the region, as well as informing future policy makers of barriers and opportunities of nature access. In addition, the results can support local communities working to provide more access to nature for myriad benefits. Ultimately, addressing barriers to

nature access can contribute to a more equitable and just future with a stronger foundation for protecting human and environmental health.

This research was conducted as part of the University of New Hampshire's Nature Economy Collaborative, a research project funded by the UNH Collaborative Research Excellence (CoRE) Initiative. The Nature Economy Collaborative focused on fostering dialogue with stakeholders and documenting changes to NH's economy as it relates to the use and value of nature. The Collaborative aimed to inform policy around four themes: education, training and workforce development, community development and quality of life, natural asset use and climate resilience. Products from the Nature Economy Collaborative project include a website: <https://mypages.unh.edu/natureeconomycollaborative>, two info briefs published on access to nature and economic implications (see Appendix A and Appendix B), an interactive workshop held in Rochester, New Hampshire for 25 participants comprised of volunteers, students, and professionals (see Appendix C for a PDF of the walking tour story map), a webinar for over 50 participants discussing some of the research results (see Appendix D for a PDF of the presentation slides), and a final report (see Appendix G). Products from the Collaborative are also available through the UNH Scholars' Repository: <https://scholars.unh.edu/>.

In Chapter 2, I will synthesize literature on the nature economy, access to nature, and the intersection of environmental justice. Chapter 3 introduces the research design and methodology, including the research objectives, research questions, design and methods of the project, data collection and data analysis of the project. In Chapter 4, I present results from the interviews. Chapter 5 discusses the research findings and provides recommendations to improve access to nature. My thesis concludes with personal reflections on my experience completing this thesis.

Please see the appendices for the Institutional Review Board approval, research interview protocol, and several outcomes from this research and the Nature Collaborative.

Chapter 2: Literature Review

In this chapter, I outline and discuss literature related to nature economy, access to nature, environmental justice, the intersection of environmental justice and access to nature, and the framing of access to nature. The Institutional Analysis and Development (IAD) framework developed by Elinor Ostrom is useful for developing theories to explain how institutions guide and constrain actors' behaviors and how human behavior, in turn, shapes and forms institutional arrangements (Schlager & Cox, 2018). The IAD is commonly used to explain how people devise institutional arrangements to solve collective action problems and provide shared benefits (Schlager & Cox, 2018). This research draws on the IAD framework to identify institutional opportunities and barriers for access to nature, which is the relevant action situation. Ostrom defines the action situation as "...the social spaces where individuals interact, exchange goods and services, solve problems, dominate one another, or fight" (Ostrom, 2011). Action situations enable an analyst to explain regularities in human actions and results, and potentially reform them (Ostrom, 2011). Table 2.1 provides an overview of the literature discussed in this chapter.

| Table 2.1 Literature on Access to Nature and Equity Concerns | | |
|---|--|---|
| Demographic Variables | Selected Concerns and Barriers | References |
| Income level | <ul style="list-style-type: none"> • Access rates decline with decreasing income and can be non-existent or difficult for low-income families. • Proximity: Areas with higher percentages of low-income populations have fewer nearby green spaces and lower quality nearby green spaces. • Increasing cost and need for transportation to access sites, creating a barrier for low income populations. | Rigolon & Flohr, 2014; Wolch et al., 2014; Izenstark et al., 2016 |

| | | |
|---------------------|---|---|
| Race | <ul style="list-style-type: none"> • Black and Hispanic Americans severely underrepresented in outdoor recreation. • Whites make up ~75% of outdoor recreators. • < 50% of Black children experienced outdoor recreation in 2021. • Urban forests and higher quality parks tend to be near whiter communities (connects to urban residency variable). | Outdoor Foundation, 2022; Wolch et al., 2014; Jennings et al., 2012 |
| Gender ¹ | <ul style="list-style-type: none"> • Women make up ~46% of outdoor recreators and is increasing. | Outdoor Foundation, 2022 |
| Urban Residency | <ul style="list-style-type: none"> • Fewer parks and less green space. • Nearby parks fail to meet needs: quality, safety. • Urban forests and higher quality parks tend to be near whiter communities (connects to race variable). • Increasing cost and need for transportation to access more distant recreation spaces. | Rigolon & Flohr, 2014; Wolch et al., 2014; Jennings et al., 2012 |
| Rural Residency | <ul style="list-style-type: none"> • More frequent interactions with nature. • Children in rural areas are more likely to experience "work" related nature experiences versus urban counterparts. • Access varies significantly based on housing type (farm, apartment, hotel, trailer). • Proximity: Nearby parks are often of low quality. • Increasing cost and need for transportation to access more distant recreation spaces. | Izenstark et al., 2016; Rosa & Collado, 2019; Gifford & Nilsson, 2014 |

¹ The gender information in Table 2.1 relies on data from the Outdoor Foundation, which uses the term gender but reports data only according to male and female Participants. As a result, the reported results may not reflect individual's gender identities.

2.1 Nature Economy

Nature economy consists of the spaces and connections between natural assets and the way local economies function, with a primary goal of creating vibrant economies and ensuring a high quality of life for all within a community (UNH Cooperative Extension, 2018). This goal is achieved through nature-based economic development by leveraging local natural assets and human capital (Rogers et al., 2022). A major component of the nature economy is outdoor

recreation, which accounts for 2.7% of NH's 2021 gross domestic product (GDP), which is 0.8% above the United States (U.S.) state average outdoor recreation contribution to GDP (BEA, 2022). The outdoor recreation GDP of New Hampshire increased by 13% between 2020 and 2021, which is slightly below the U.S. state average increase of 13.1 % (BEA, 2022). Additionally, since 2020, the outdoor recreation value-added growth has increased by 17.8% for NH, which is lower than the U.S. average increase of 24.7% (BEA, 2022). Understanding why NH's outdoor recreation value-added growth lags other states could be greatly beneficial to protect and grow this important facet of NH's economy.

However, this research adopts a broader definition, which extends beyond tracking dollars spent on recreation and contribution to the state GDP to encompass a more holistic view of influence on economic development. For example, NH's natural assets provide quality of life benefits that are great advantages for business, workforce attraction, and youth retention (Rogers et al., n.d.). Nature economy is also a critical component of climate resilience and equity in social justice endeavors. Green infrastructures are increasingly being utilized for climate environmental regulation services, such as flood control and climate control (Kim & Song, 2019). These green infrastructures are multifaceted. They address improve environmental conditions and also contribute to the local economy through increased rates of tourism and recreation (SEP, 2012). Installation and operation of green infrastructure can contribute to the underdeveloped communities being seen as more attractive to live and invest in, as well as contributing to economic growth, supplying jobs, increasing quality of life, and raising property values (Kim & Song, 2019; Heckert & Rosan, 2016; SEP, 2012). The impacts of green infrastructures extend past recreation, as they can contribute to direct use values as well. For example, if an ecosystem service produced by the infrastructure is higher quality water, this can

directly lead to greater profits from agricultural productivity or decreasing costs required to provide clean drinking water (SEP, 2012).

2.2 Access to Nature

Access to nature and the natural environment has been found to be a critical component of economic, social, and ecological resilience for a community (Rogers & Garlick, 2021). In addition to community benefits, nature access provides numerous benefits to human health and general well-being (Bratman et al., 2015; McCormick, 2017; Ward Thompson & Aspinall, 2011; Winter et al., 2019). Adults immersed in nature for as little as one hour have displayed a decrease in anxiety and stress, as well as generating positive cognitive improvements, such as greater attentiveness and improved working memory (Bratman et al., 2015; Winter et al., 2019). While many people may seek out nature for rest and relaxation, leisure activities in these spaces also provide physical health benefits and reduce healthcare spending on preventable illnesses and problems, even if these are not an individual's primary objective, through walking and increasing activity levels, (Ward Thompson & Aspinall, 2011; Rosenberger et al., 2005). Nature access has an even greater impact on the development of children. In addition to mental health benefits, nature access is associated with improved behavior, reduced symptoms of ADHD, reduced body mass indexes, and increased testing scores (McCormick, 2017; Winter et al., 2019). Engaging in nature-based recreational experiences as a child is linked to positive environmental attitudes and increased participation in land stewardship, conservation, and volunteer activities (Winter et al., 2019).

Outdoor recreation participation in 2021 was at record high levels, but the participants were not particularly diverse. Almost 72% of outdoor participants were white and almost 54% of

participants were male (Outdoor Foundation, 2022). Although there has been a slight increase in the diversity of outdoor recreation participants, current participants remain less diverse relative to the overall U.S. population and are particularly troubling for Black American youth. Fewer than 50% of Black American youth experienced any outdoor recreation in 2021 and these children are also less likely to become adult outdoor recreation participants (Outdoor Foundation, 2022). Given the clear connection between nature access and the wellbeing of people and their communities, barriers preventing access to nature should be addressed to advance health and equity.

2.3 Intersection of Environmental Justice and Access to Nature

The EPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to development, implementation, and enforcement of environmental laws, regulations, and policies (EPA, 2020). Communities that lack justice and equity regarding the environment are often referred to as environmental justice communities and are predominantly communities with high percentages of minority, low-income, tribal, and other vulnerable populations (EPA, 2021). Similarly, the U.S. Department of Agriculture (USDA) views advancing environmental justice as a tool to meet the needs of underserved communities through reducing disparate environmental burdens, removing barriers to participation in decision making, ensuring populations have appropriate access to the benefits of government programs, and increasing access to environmental benefits that help all communities stay safe and healthy (USDA, n.d.). One initiative from USDA focused on the needs of rural communities by developing an information center to address environmental justice concerns specifically for rural communities (USDA, n.d.). An example of an environmental

justice concern for rural communities is that individuals in rural communities are more likely to be exposed to environmental hazards, as compared to urban residents (Jones, 2011).

Residents of rural areas experience the environment in very different ways from urban residents. Although rural residents interact with nature on a more frequent basis (Gifford & Nilsson, 2014), they are not necessarily more likely to hold a more pro-ecological ideology, as compared to urban residents. While urban adults have been found to be more vocal and active toward pro-environmental issues than their rural counterparts, children in rural areas have been found to be more pro-environmental urban children (Rosa & Collado, 2019). In addition to contact with nature, the type of experience in nature influences attitudes and behaviors (Rosa & Collado, 2019). While nature-based recreation influences children to becoming more environmentally friendly adults, work-related experiences in nature do not produce the same feelings. Children who experience nature primarily through agricultural-related work report a negative perception and attitude toward nature and environmentalism (Rosa & Collado, 2019). This negative perception of nature reduces the rate of psychological restoration, the positive mental health benefits of nature-based recreation, which in turn decreases the likelihood of spending leisure time in nature (von Lindern et al., 2013).

Given the quantifiable mental and physical health benefits resulting from access to nature, reduced nature access for low-income and ethnic minority children is an environmental justice concern (Rigolon & Flohr, 2014; Wolch et al., 2014; Jennings et al., 2012). Low-income minority children have less nature access than white or more affluent children due to nearby parks being of lower quality and fewer acres of nearby green spaces (Rigolon & Flohr, 2014; Wolch et al., 2014). A review of the literature on urban green spaces and environmental justice found that the placement and design of urban parks do not meet the needs of socially

disadvantaged groups. This review also found that urban forests with a high canopy cover percentage and public right of ways with greater numbers of trees are more commonly observed near white populations (Jennings et al., 2012). Environmental injustices compound when race and socio-economic class intersect with rurality as individuals lack the financial and social resources to mitigate health and environmental harm or face barriers limited their ability to influence local and state government policy or action (Kelly-Reif & Wing, 2016). Regardless of geographic region, all mothers participating in one study explained the importance to their families of publicly available nature-based recreation opportunities (Izenstark et al., 2016). However, for rural residing, low-income mothers, no cost nature-based activities are needed to keep themselves and their children healthy (Izenstark et al., 2016). Access to nature was found to vary broadly for rural residents depending on housing type, such as a farm, apartment, trailer, or hotel (Izenstark et al., 2016). For example, one rural family living in a trailer park expressed that the only greenspace near their home was a small park in poor condition (Izenstark et al., 2016).

Chapter 3: Research Design and Methodology

In this chapter, I introduce the research design and methodology, including the research objectives, research questions, data collection methods, and data analysis methods.

3.1 Research Objectives

The primary objectives of this study were to: (1) understand the barriers and opportunities of access to nature and its benefits for underserved communities; (2) share information about these barriers and opportunities with local, regional, and state organizations in this sector (e.g., regional land conservation and planning organizations, New Hampshire Department of Environmental Services), and (3) contribute to strategies to ensure equity is at the forefront of all environmental protection, justice efforts, and future policy considerations that impact underserved communities.

3.2 Research Questions

This research evaluates nature access in NH and asks:

- What do “nature economy” and “access to nature” mean for people engaged in the nature economy, economic development, recreation, conservation, and community development sectors of New Hampshire?
- What benefits, barriers, and opportunities for access to nature do participants in this sector perceive, with a focus on underserved communities?
- What challenges do these organizations active in this sector face in trying to expand access to nature?

3.3 Research Design and Methods

This research was part of the broader UNH Nature Economy Collaborative Research Excellence (CoRE) team project. This research involved qualitative analysis of 19 interviews with statewide policy leaders and stakeholders that work with individuals and organizations closely related to nature economy and nature access. New Hampshire presents an interesting case study because the state is more rural than other states, at 39.7% living in rural communities (Iowa State, n.d.) while also being wealthier than other states, with 7% of the population living under the federal poverty line (U.S. Census Bureau, 2022b). New Hampshire is also whiter than many other states, although racial diversity, particularly among children is increasing (Johnson, 2021). In addition, a case study conducted with the City of Rochester, New Hampshire, focused on a municipal perspective.

3.3.1 Rochester Case Study

Rochester, NH, located within Strafford County, was selected as a mini-case study, due to city demographic data as well as the City's characteristics. Compared to the State of NH, Rochester is poorer. In 2021, the median household income of Rochester was \$70,582 which is \$25,151 lower than the Strafford County median household income of \$95,733 (U.S. Census Bureau, 2022a). Rochester, NH also has a higher poverty rate, 9.3%, compared to that of Strafford County, 8.7% (U.S. Census Bureau, 2022a). Rochester is less diverse than NH overall, with around 93% White, 2% Asian, and 1% Black residents. As of 2020, Rochester is one of the fastest growing communities in New Hampshire, with noted significant growth over the previous ten-year period (Haas, 2021).

Rochester was also a particularly interesting case study because of its recent efforts to improve access to nature and recreation opportunities. In 2011, the city adopted a recreation master plan. Key findings included that the city has a lower median household income than the national average, little ethnic diversity, and that the userbase of existing recreation sites is larger than the city, drawing many users from surrounding communities (Bargmann & Ballard, 2011). Particularly relevant for this research, the master plan notes that the City has a significant inventory of private and city owned natural and underdeveloped park areas, a variety of open spaces and preservation areas that lack formal designation of these land areas for this purpose, that while most open space and preservation areas have trails within parks there is no regional or connected community trail system, and that the City has few neighborhood parks and does not have a true regional park (Bargmann & Ballard, 2011). In response to these issues, Rochester has recently made efforts to remediate and improve nature access. The Access to Nature and Economy in Rochester, NH story map (Appendix C) displays some of the City's efforts, such as enhancing outdoor seating and shaded walking paths along the Cochecho River, improving rail trails in the community, and improving parks and playgrounds for families.

3.4 Data Collection Methods

The 19 interview participants were identified by the University of New Hampshire Nature Economy Collaborative working group as individuals and organizations engaged in activities closely related to nature economy and nature access. Data on the interview participants is provided in chapter four. All 19 participants were asked statewide interview questions focusing on New Hampshire in general. Nine out of the 19 participants were also asked questions relevant to the Rochester mini-case study. Interview participants were contacted by email using utilizing a script approved by the UNH Institutional Review Board (IRB) for the Protection of

Human Subjects in Research, IRB-FY2022-303 (see Appendix E). In accordance with the IRB approval, interviewee and organizational identities are confidential and results are reported in aggregate. Interviews were conducted by members of the UNH Nature Economy Collaborative working group. All interviews were conducted virtually, through a videoconferencing program such as Zoom or Microsoft Teams, at a time of the participants choosing. Prior to the start of the interview, verbal consent was received to participate in the interview and for the interview to be recorded. The interview protocol included open ended questions, with table 2.1 used in the conceptualization and initial implementation of some interview questions for the study (see Appendix F). During interviews, short notes were recorded, which were supplemented with more detailed notes from reviewing the post-interview recording to create interview summaries. Interviews were not transcribed verbatim.

3.5 Analytic Methods

Qualitative research methodologies were used to analyze data collected through the interviews (Galletta, 2013), with barriers and opportunities for nature access identified by highlighting the connections between variables impacting nature access. Data were coded using Excel according to themes identified in table 2.1 through an iterative, hybrid inductive and deductive approach, allowing for exploration. I first assigned initial codes to the data set, discussed the coding strategy with other team members, revised the coding strategy, and applied the revised strategy to all data. I then sorted the data according to codes and identified trends and patterns to synthesize findings.

Chapter 4: Results and Analysis

In this chapter, I present information about the interview participants and the interview results and analysis.

4.1 Interview Participant Information

The 19 interview participants came from different sectors closely related to nature economy and nature access in NH, including state government agencies, local government agencies, nonprofit organizations, volunteer committees, and local businesses. Figure 4.1 displays the breakdown of interview participants by sector, with nine nonprofit participants, five government participants, three businesses, and two volunteer committee or volunteer board participants. Figure 4.2 displays interview participants according to their geographic area of focus: nine Rochester participants, six statewide participants, and four regional participants. Figure 4.3 further breaks down the Rochester participants by organizational category, with three government based participants, three businesses, two volunteer committees or volunteer boards, and one nonprofit participant.

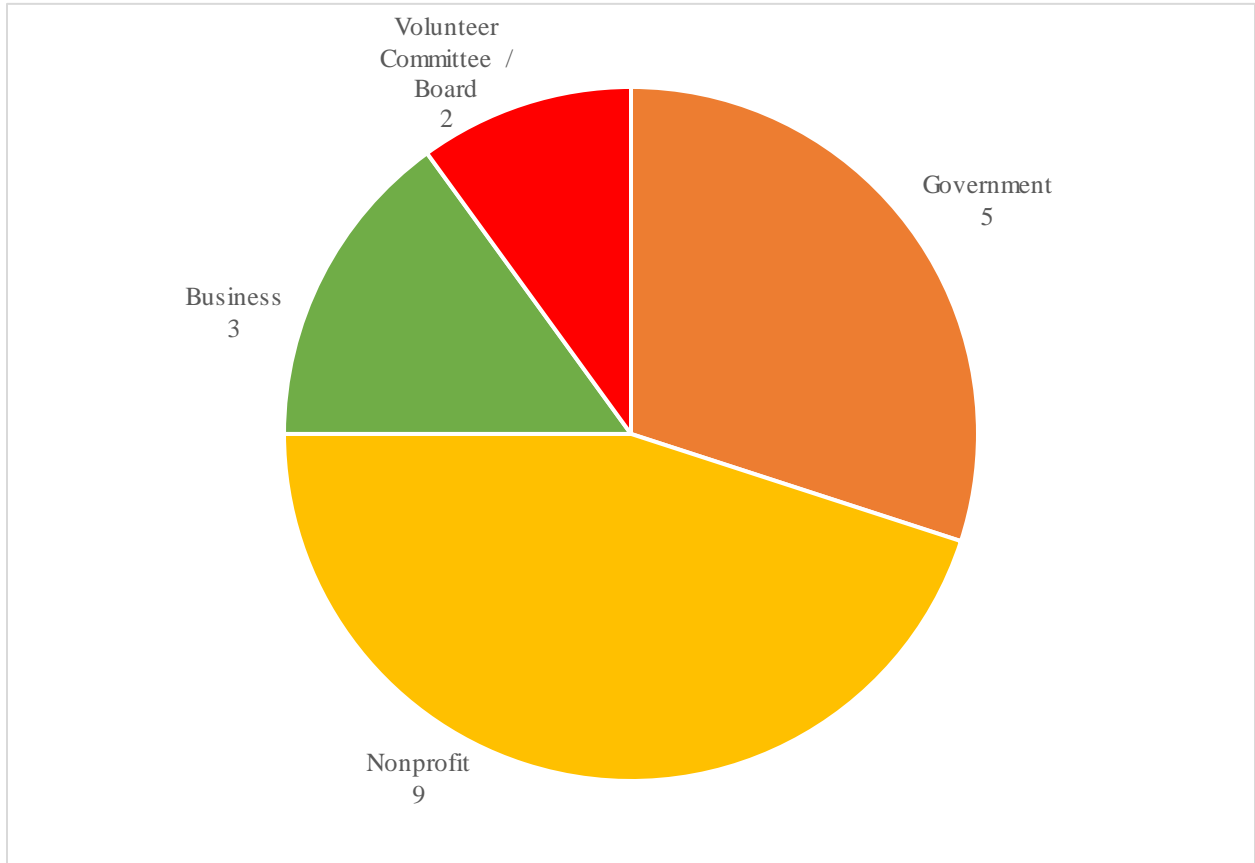


Figure 4.1. Organization Category for the 19 Key Informant Interview Participants.

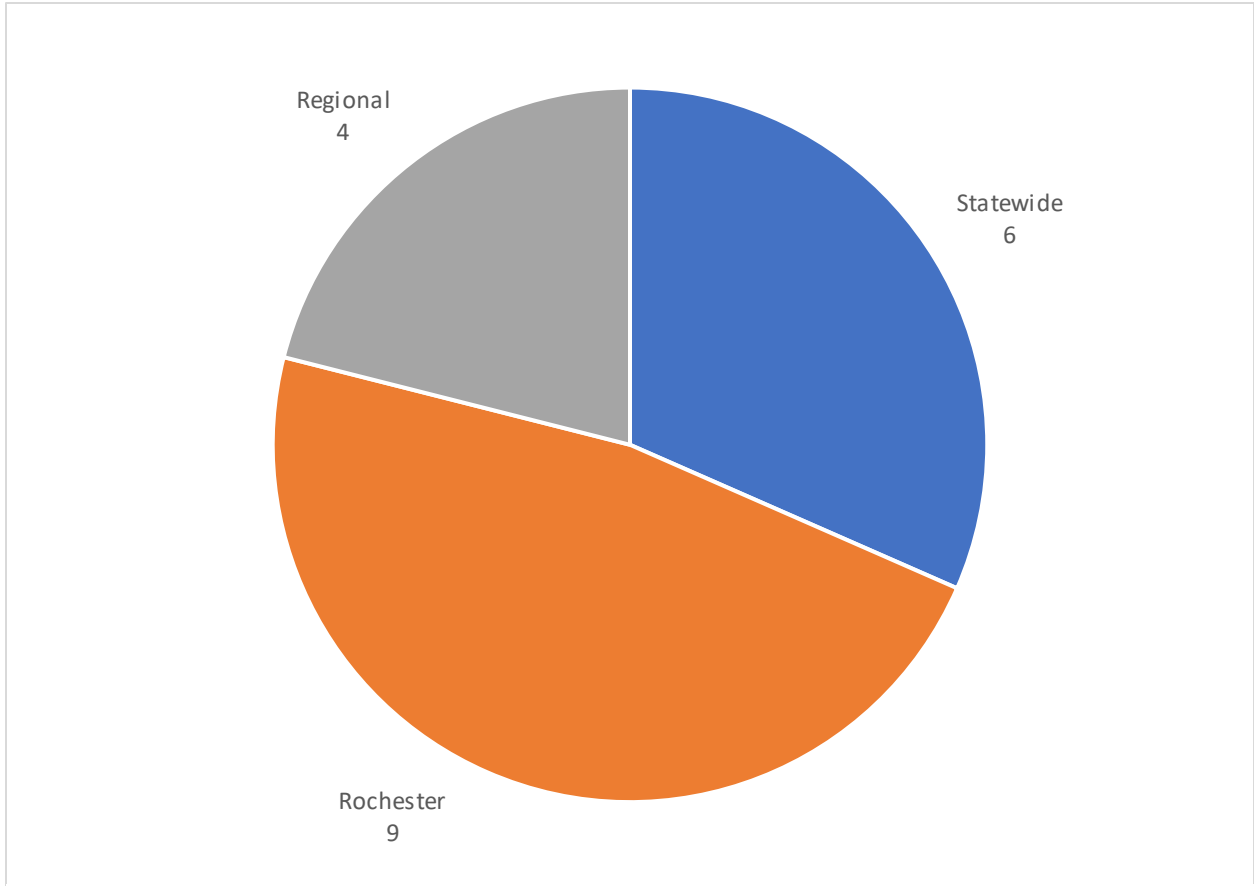


Figure 4.2. Geographic Region of Focus for the Participating Organizations in the 19 Key Informant Interviews.

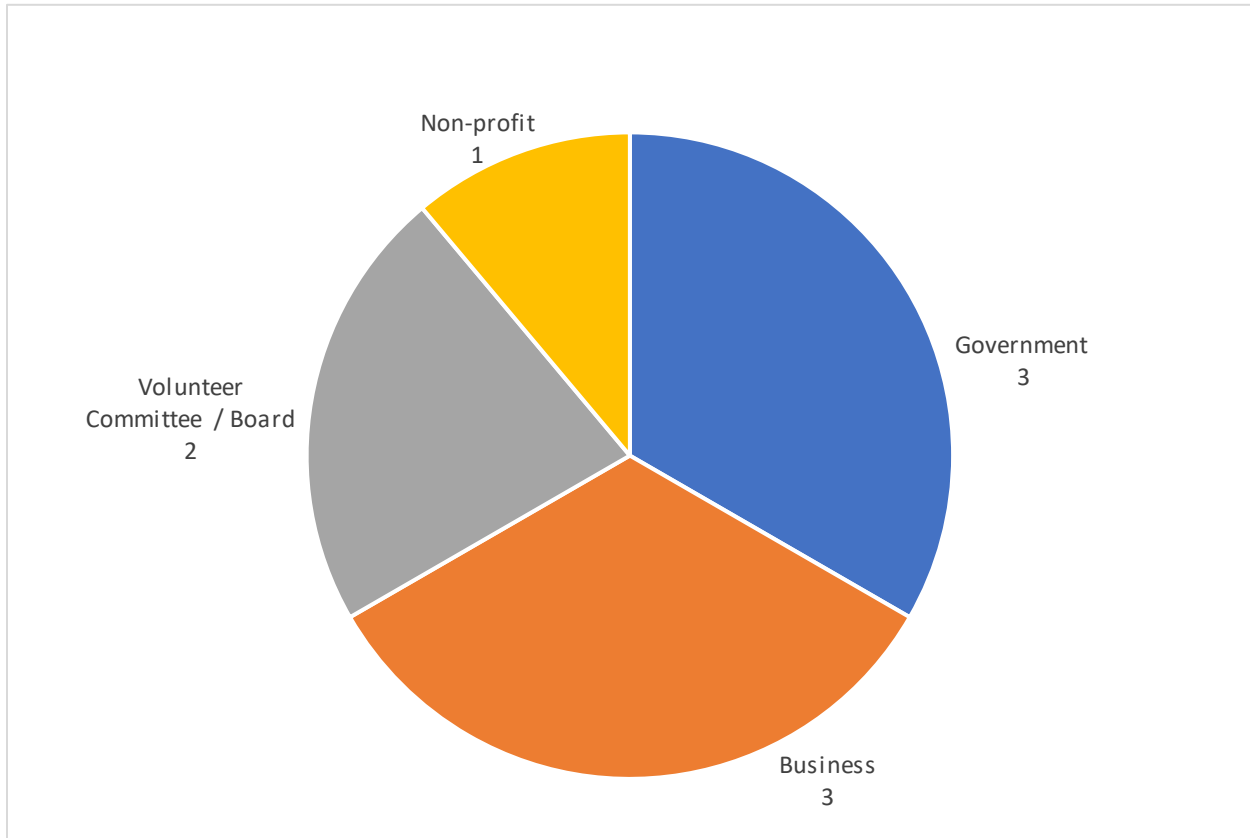


Figure 4.3. Organization Category for the 9 Rochester Key Informant Interview Participants.

4.2 Relationship to Nature Economy.

Participants were asked to describe how their work involves nature and natural assets and how they view and define the contribution of their work to the economy. While this question was very open-ended, common themes emerged across their different responses. Four of the interview participants used the phrase “intersections” to refer to the connection between their work and nature. One nonprofit stated, “My work relates to the economy, as well as use and value of nature, because we operate at an intersection of missions involving recreation, environmental education, conservation, and stewardship.” Similarly, nine participants’ responses identified recreation, environmental education, conservation, and stewardship as connections between their work and nature. As one government participant stated, “[Government Office]

exists because it is at the intersection of all those things. Our goal is to enhance outdoor recreation for tourists, citizens, and economy.” The importance of outdoor recreation to NH and to the state’s economy was another common theme across the interviews. Eight participants described their work as connecting to the economy through their focus on recreation or outdoor recreation. One nonprofit stated,

We view our work as deeply rooted in recreation economy with many of our sites and locations being on public lands, drawing an increase of visitors and recreators. These opportunities can help to fuel the economy. We provide these services, as well as conservation services to maintain these resources and recreation opportunities, as we view outdoor recreation economy as a big piece of New Hampshire.

Another statement from a nonprofit described the importance of outdoor recreation to NH’s identity, “Push recognition of nature economy as an economic model reflecting the way of life moving forward. Outdoor recreation is an important part of community DNA in New Hampshire. So, cultivating responsible economic development with sustainability implications is important.”

Five of the participants initially stated they did not view their work as having a direct connection to the economy. However, over the course of the interview, they did identify connections and ways they viewed their work as tangentially related or connected to the economy and nature. For example, a nonprofit participant stated, “This work relates to nature because it looks at quality and health of different habitats and watershed to improve them and work with partners who do the improving. It doesn’t always explicitly apply to economy, but it is tangential to the work we do.” In addition, one government participant stated, “None of my work has a direct nexus to the outdoor economy but some of the projects on the priority list are tied into nature economy.”

Two interview participants mentioned environmental education. One nonprofit stated, “The reason that [Nonprofit] came about was that conservation organizations, from towns to larger conservation groups have expressed that they didn’t have enough volunteers to manage their land as well as their need for volunteers to help with ongoing projects. Traditionally, volunteers have been the primary means of maintaining these sites. That’s one of the projects I work on, the other projects I work on are related to citizen science or training volunteers for the outdoors.” This statement organization focuses on the educational aspect, but also on conservation and land stewardship themes, which were mentioned by two participants.

Three interview participants identified efforts to balance economic development with protecting natural assets. One government participant described a synergistic relationship between development and green spaces, “So much of my work revolves around storm water and creating healthy environments with new developments. Maybe not necessarily focusing on specific environments, but how those environments interact with new developments as well as how to plan for future developments.” In contrast, one volunteer committee / board participant characterized economic development and protecting natural assets as more of a tension. “With the [Volunteer Board], we are much more focused on the conservation aspect versus economic aspect in Rochester, but there is a balance. There are committees that are really pushing to develop new buildings in Rochester and my role is to try to strike a balance between still having economic growth while maintaining green space.”

Three of the participants identified “partners” or “partnerships” as being important to the work that they do and for connecting their work to nature and the economy. One nonprofit participant stated, “Part of my job involves partnerships with state and federal agencies, as well as other partners, to find intersection of [Nonprofit’s] goals with the goals of the partners. Some

of our other partners include nonprofit organizations, the environmental community, and academic organizations.”

Participants were also asked how they viewed the impact of their work on the economy. The three business participants described having direct and measurable impacts on the economy, as well as being a driver or at a minimum contributing to the economy. For example, a business participant stated, “We’re a catalyst for the local economy, but it is mutually beneficial. Some people come to Rochester specifically for [business]...we make sure to direct these people to local resources and stores.” There was significant variation between responses from the nine nonprofit participants. Some described having minimal or only partial impacts, while others outlined large and measurable impacts of their work on the economy. For example, one nonprofit described the impact of their work on the economy as, “Pretty minimal. We pay scientists and contractors.” Another nonprofit stated we “...commissioned an economic impact study four years ago, with three of our ski glades contributing over \$1 million to the economy and 16 full time jobs, over just one season.” All five government participants viewed their work as having measurable impacts on the economy, although the answers varied as to the level of impact. One government participant said, “I’m quite fortunate in that I get to work with small municipalities, small towns, and small businesses. I get to see even the smallest efforts make positive impacts to these communities.” A different government participant described their impact as “...huge on the economy. We focus on improving the quality of life as well as the economy of everyone in Rochester”. Not all respondents described economic impacts as being the driver of their actions, however. One government participant stated, “We try to carry forward conservation needs and access needs with all programs and construction coming in.” The two volunteer committees or volunteer boards had differing views as to how their work impacts the economy. One

interviewee shared “...our work has minimal impact. The [Organization’s] work is more about getting economic things approved by the city.” In contrast, the other participant stated, “Our work is meant to support the local economy and bring people downtown to spend money on restaurants and retail locations.”

4.2.1 Relationship to Nature Economy and Rochester.

In response to the question about how they view and define the contribution of their work to the economy, seven of the nine Rochester participants described ways in which their work made measurable impacts on the economy, although the participants varied in how impactful they believed their work to be. Two of the nine Rochester participants described the difficulties in putting monetary value to their work or measuring the actual economic impact of their work, with one nonprofit stating, “I think it is difficult to measure, but widespread across all communities that we have protected land in. We cover 52 towns and we’ve done projects in at least 40 of them. It is really hard to measure the economic impacts or money brought in from some of the projects that we do. How do we measure cleaner water for the public?”

4.3 Natural Assets of New Hampshire

To better understand what access to nature means, interview participants were asked to identify natural assets within New Hampshire. Figure 4.4 displays the natural assets most often mentioned and discussed by interview participants. Many of the assets mentioned by the interview participants can be considered destination assets that require transportation to access and utilize. Mountains were the most frequently mentioned asset (17 of the 19 participants.) Water related assets were the second most mentioned, with 15 participants discussing them. Hiking / trails were the third most mentioned asset by nine participants. Forests and wooded

areas were the fourth most mentioned assets (eight participants). One government participant stated, “We are so lucky to have a seacoast in addition to the White Mountains... we have beautiful lakes, rivers, and mountains, as well as our seacoast. It’s the backbone of our natural assets.”

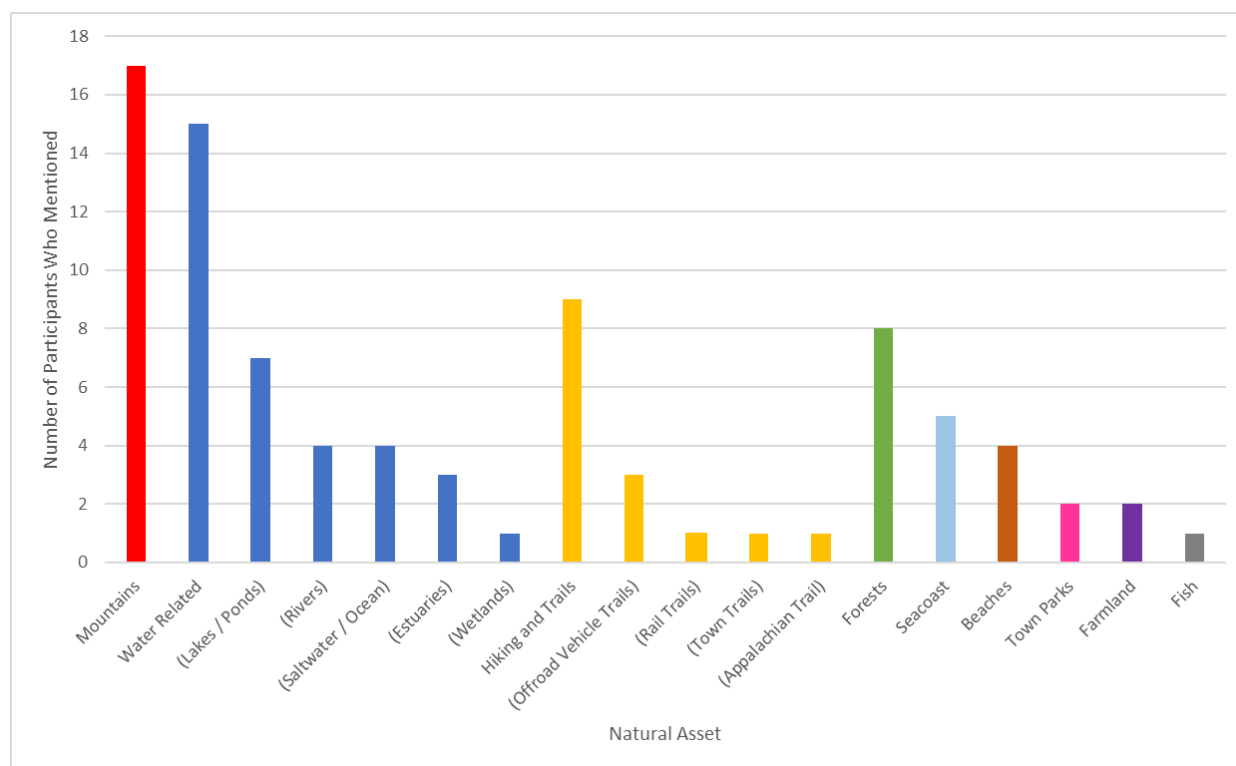


Figure 4.4. New Hampshire’s Natural Assets and the Number of Times Mentioned During Interviews. Each mention of a specific water or hiking and trail related asset was counted individually and also included in the count of the more general “water related” or “hiking and trails” categories.

4.3.1 Natural Assets of Rochester

The nine Rochester interview participants were asked to identify natural assets within the City of Rochester, in addition to NH natural assets. Figure 4.5 shows the most frequently mentioned natural assets for Rochester. Interview participants most frequently mentioned the Cocheco River, and Rochester’s community trails (each was mentioned by six of the nine participants). One business participant stated, “We have the Gonic Trails and other natural

beauty surrounding the area, and the City is trying to figure out how to expand on the beautiful river and local trails and improve the perception of the City.” The focus on the Cocheco River and community trails was further supported by one government participant, who stated, “In Rochester, we don’t have as much in terms of natural assets, but we do have the beauty and rivers. We are working to enhance those as well as improving our trails... We’re also finding that our trails are increasing in popularity so we’re trying to improve them and connect them to other nearby cities and communities.”

Lacking a major draw or identity for the city was an aspect mentioned by three of the nine interview participants. One business stated “There is no one main attraction in Rochester. We don’t have a big state park and we don’t have the big draws; we need to reframe how people think of nature.” The concept of lacking a major natural asset to attract attention was further supported by two participants who said they could not identify a Rochester natural asset or were not familiar with many local resources. For example, one business participant stated, “I don’t spend a lot of time in Rochester, but it’s close to the seacoast and mountains. There are some mountain bike trails like the Gonic Trail.”

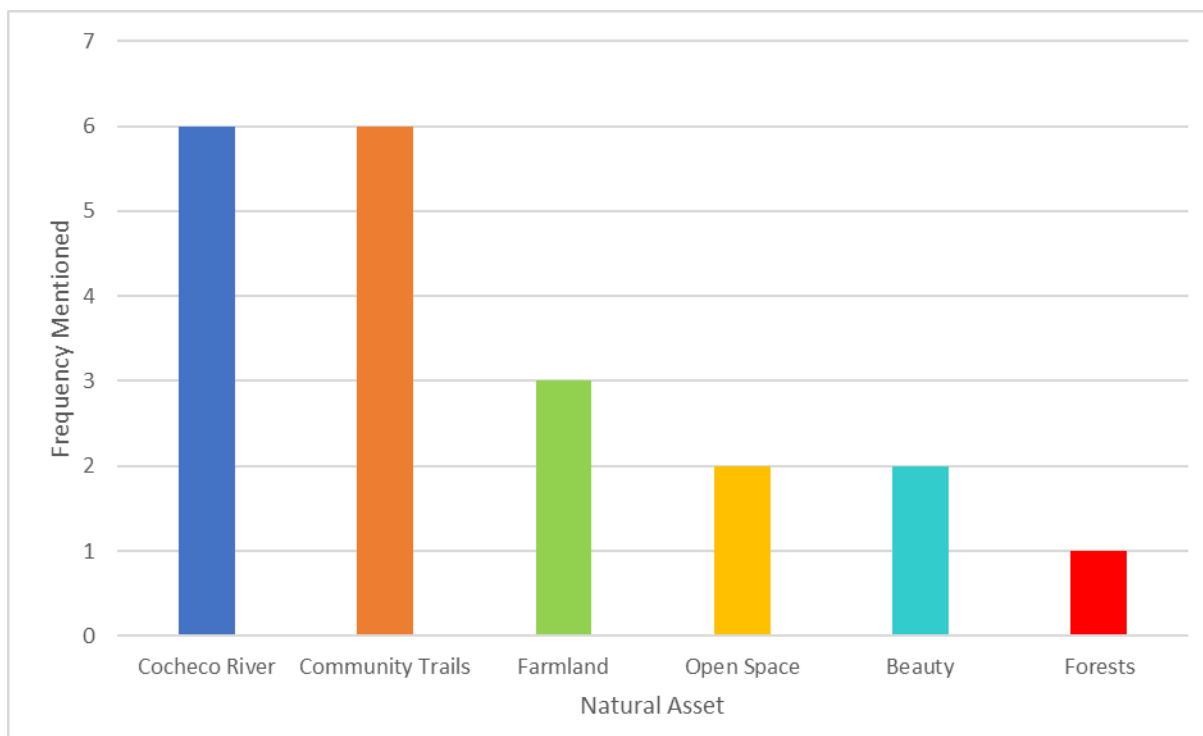


Figure 4.5. Rochester Specific Natural Assets Mentioned During Rochester Case Study Interviews.

4.3.2 Natural Assets of New Hampshire Compared to Natural Assets of Rochester.

Responses to questions asking about Rochester’s natural assets more frequently identified specific, nearby natural assets, such as the Cocheco River and community trails, in comparison to the responses to questions about statewide assets, which identified destination assets more frequently, such as mountains, lakes, or the Seacoast. At the local level, respondents identified assets within the municipality of Rochester itself, such as open space and farmland and the City’s beauty, and less frequently identified destination assets and the City’s proximity to destination assets.

When comparing responses from the same interviewee across the question focused on statewide natural assets and the specific Rochester questions, four of the nine participants identified similar types of resources. However, when these four participants identified resources,

the type of asset or reasoning behind the asset identification varied. For example, when discussing water related assets at the statewide level, the participants identified lakes, the ocean, and rivers as being opportunities for places to go and recreate, whether by boating, swimming, or other water activities. When discussing water related assets at the Rochester level, the participants instead identified the beauty and aesthetic value of the Cochecho River but did not mention the recreation value or opportunities associated with these assets. Regarding the statewide assets, one government participant stated, "...it's the mountains, the fall season, the outdoor recreation... We have a lot of trails, mountains, skiing, lakes, and snowmobiling trails. New Hampshire has pretty much all sports available." When asked about Rochester specific assets, the same government participant stated, "In Rochester, we don't have as much in terms of natural assets, but we do have the beauty and rivers."

4.4. Access to Nature and the Barriers Preventing Access

This section looks at data collected from two interview questions. The first question asked whether everyone in New Hampshire has equal access to nature. A follow-up question asked participants to identify any barriers that prevent equal access to nature and who is impacted by barriers to nature access.

4.4.1 Access to Nature in New Hampshire

The 19 interview participants were asked if, from their perspective, they think that everyone has access to nature. The responses provided a great deal of nuances and mixed opinions regarding the level of accessibility of nature, as well as variations in how the interview participant personally defined accessing nature.

Shown in figure 4.6, nine of the 19 interview participants reported that some individuals in NH do not have equal access to nature. When asked about nature accessibility, one nonprofit participant said, “I think there are a number of access issues and NH is very behind in supporting, protecting, and preserving its natural assets.” Eight of the 19 interview participants reported that everyone in NH has equal access to nature, with one nonprofit participant stating, “From a local standpoint, everyone has access to nature”. Two additional participants stated “maybe” or were unsure as to whether everyone in NH has equal access to nature. One business stated, “Yes and no. I would say that for those that have access to good transportation, the wider part of New Hampshire is accessible, but you have to own reliable transportation”.

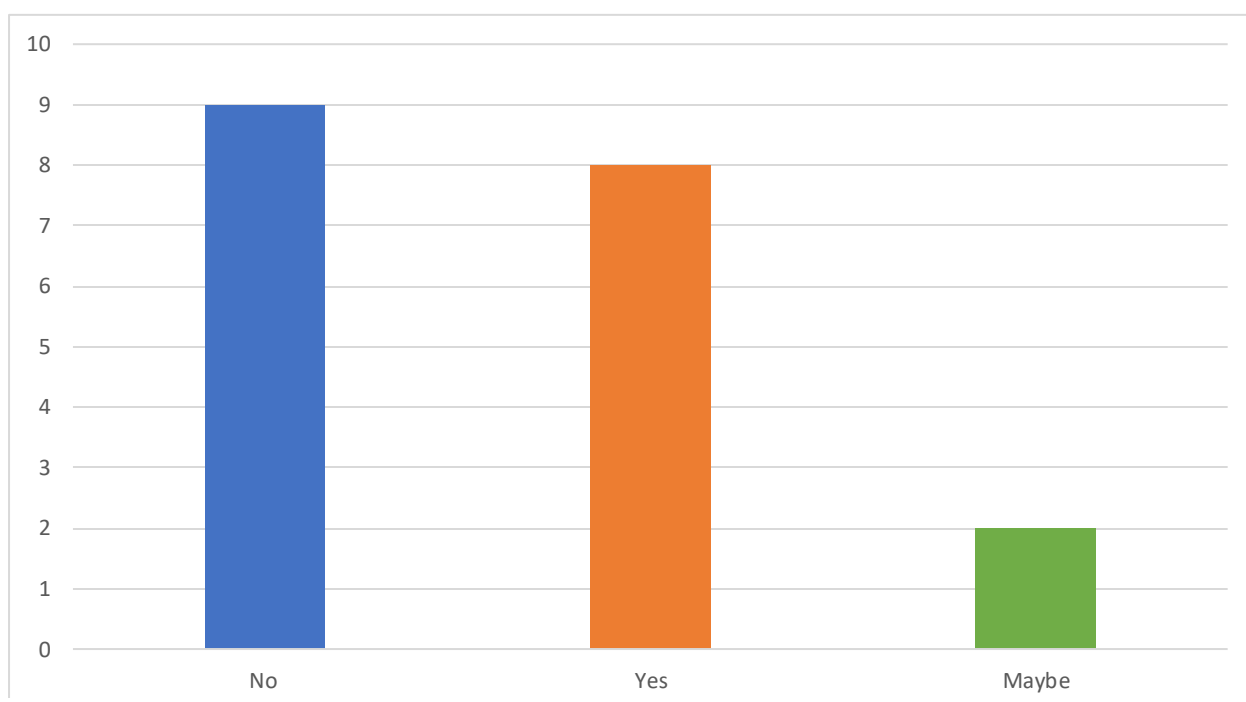


Figure 4.6. Does Everyone in New Hampshire Have Equal Access to Nature, all Participant Responses

When sorting responses to this question by respondents’ organizational categories, it appears that nonprofit organizations may be more likely to perceive there to be access to nature issues than respondents in government positions, businesses or those who participate in volunteer

committees or volunteer boards, shown in Figure 4.7. One explanation could be that the nonprofit organizations tend to work more directly with the local population, which gives them a first-hand perspective on barriers.

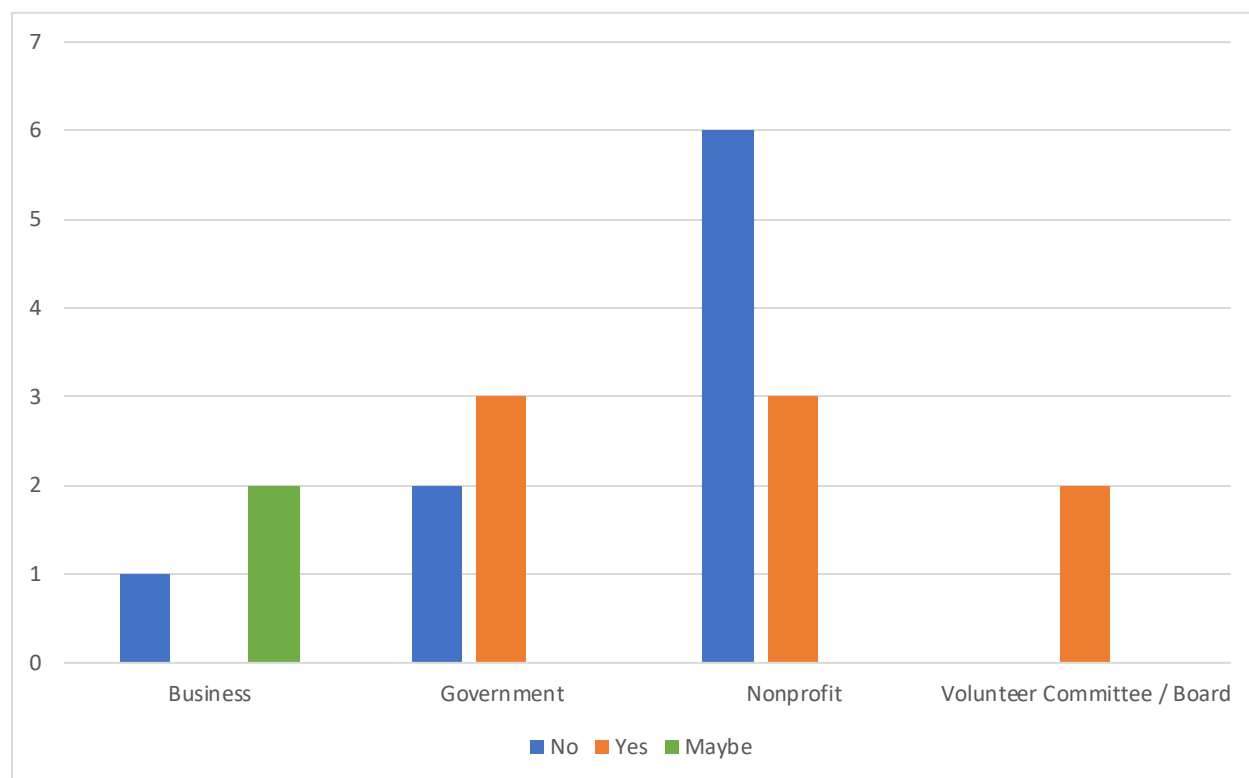


Figure 4.7. Does Everyone in New Hampshire Have Equal Access to Nature, Sorted by Organization Category of Interview Participant.

4.4.2 Access to Nature and Rochester

Only two of the nine Rochester participants specifically mentioned access to nature within the city, however all nine participants described accessibility levels at the generalized state level. Four of the nine Rochester participants reported everyone in NH as having equal access to nature, with one government participant stating, “Yes, I think that everyone has access to nature in Rochester. We’re not a huge city, so we have nature all around us. You can walk downtown and hear the birds, but we have trails and public parks that are free and accessible to

the entire community.” In contrast, three of the nine Rochester participants reported there was not equal access to nature in NH, with one business participant stating, “No and I think that’s a big problem. I think it gets a little conflated, like if you ask the average person, I think they would assume that people can just go outside and that’s accessing nature. But I think we need to look at making sure that people can really connect with nature, and that the connection makes the individual feel like they are “a part of it” and that they belong”. Finally, responses from two of the nine Rochester participants were uncertain or mixed on accessibility of nature, with one business participant stating, “Yes and no. I would say that for those that have access to good transportation, the wider part of New Hampshire is accessible, but you have to own reliable transportation”.

4.4.3 Access to Nature in New Hampshire Compared to Access to Nature in Rochester

When comparing the Rochester interview responses with all the responses, there appears to be very little variation in whether the participants reported that everyone in New Hampshire has equal access to nature. 47% of all interview participants (nine of 19) and 33% of Rochester participants (three of nine) believe that there is not equal access to nature. 42% of all participants (eight of 19) and 44% of Rochester participants (four of nine) believe that there is equal access to nature. The two participants that were uncertain about access to nature were both Rochester participants.

4.4.4 Barriers Preventing Access to Nature in New Hampshire.

The interview participants were asked about barriers preventing nature access and who these barriers impact. All 19 participants identified and described impacts of barriers, even if they had previously reported that everyone in NH has equal access. Figure 4.8 displays these listed barriers. Transportation was the most frequently identified barrier, by 13 of the 19 participants. The second most mentioned barrier was the cost to the individual, which was identified by eight of the 19 participants. Knowledge and infrastructure were tied for the third most frequently mentioned barrier, discussed by seven of the 19 participants. Time was the fifth most mentioned barrier to accessing nature, identified by five of the 19 interview participants.

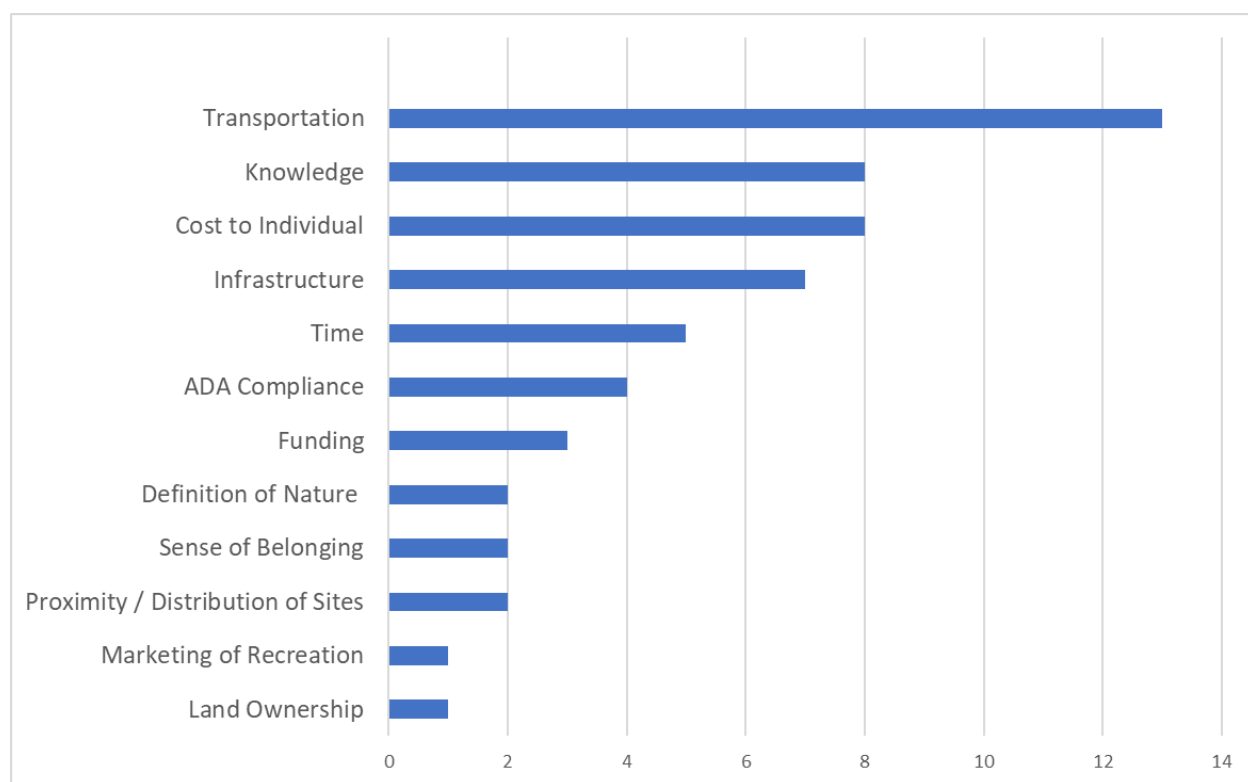


Figure 4.8. Barriers to Accessing Nature and the Number of Times Mentioned by Interview Participants.

Table 4.1 shows that there does not appear to be much variation in which barriers to accessing nature are identified by the different participant organization categories. This could be an indication that the barriers to accessing nature are prevalent and well recognized by many organizations, regardless of category.

| Table 4.1 Barriers to Accessing Nature and Number of Times Mentioned, Sorted by Interview Participant Category. | |
|---|--|
| Participant Organization Category | Identified Barriers and # Times Mentioned |
| Nonprofit | Transportation (7), Knowledge (6), Cost to Individual (3), Infrastructure (3), Time (2), Proximity / Distribution of Sites (2), Definition of Nature (2), ADA Compliance (1), Funding (1), Sense of Belonging (1), Environmental Justice (1), Marketing of Recreation (1). |
| Government | Transportation (3), Cost to Individual (2), Infrastructure (2), ADA Compliance (2), Funding (2), Knowledge (1), Time (1), Land Ownership (1). |
| Business | Transportation (2), Time (2), Knowledge (1), Cost to Individual (1). |
| Volunteer Committee / Board | Cost to Individual (2), Infrastructure (2), Transportation (1), ADA Compliance (1), Sense of Belonging (1). |

4.4.5 Barriers Preventing Access to Nature and Rochester

Focusing on responses from the Rochester interview participants to questions about barriers to nature access, most Rochester participants identified barriers specific to the residents of the city, but all participants identified barriers preventing access at the general NH level. These responses provided very similar results to the statewide interviews, with all nine Rochester participants identifying and describing barriers that prevent access to nature, even if they had

previously stated that everyone has equal access to nature. Figure 4.9 shows the barriers identified by the Rochester participants as well as the total number of interview participants that mentioned these barriers during the interviews. The five most mentioned barriers were, transportation, by six of the nine participants, cost to individual by five of the nine participants, time was identified by four of the nine participants, and infrastructure and ADA compliance were both mentioned by three of the nine participants.

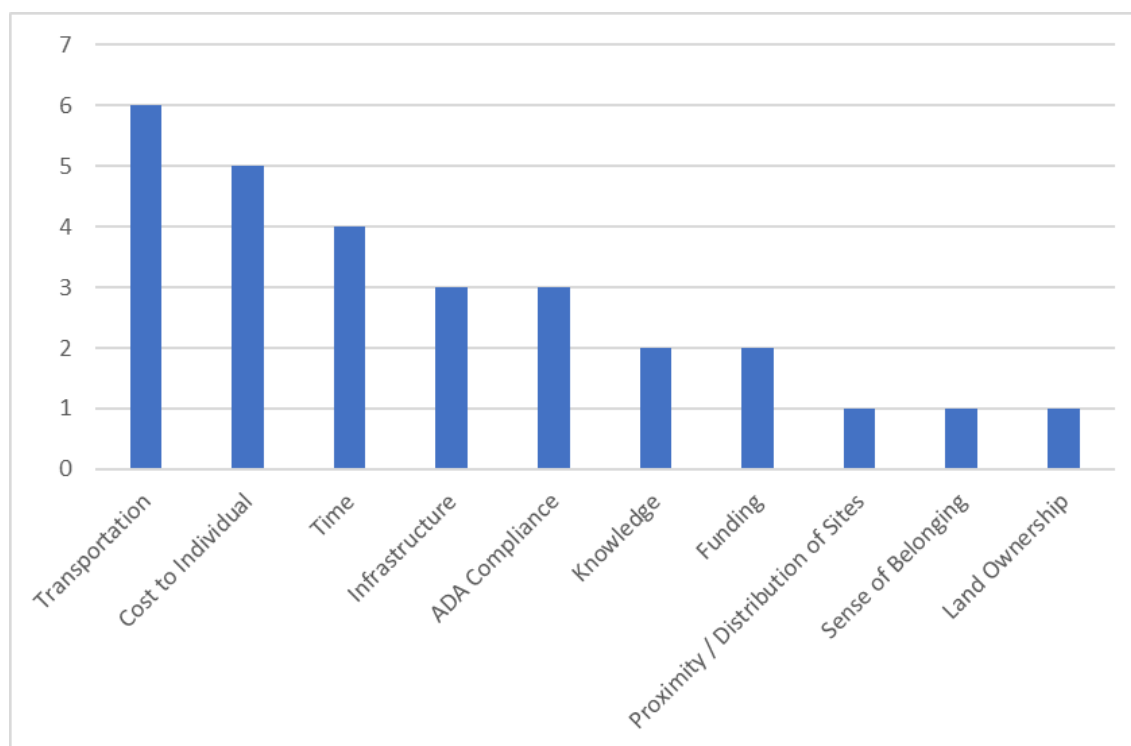


Figure 4.9 Barriers to Accessing Nature Mentioned by Rochester Interview Participants.

4.4.6 Barriers Preventing Access to Nature, Statewide Results Compared to Rochester Results

Comparing Figure 4.8 to Figure 4.9 shows that there appears to be little variation in the identified barriers between the statewide interview results and the Rochester selected responses. Transportation, cost to individual, time, and infrastructure related barriers were within the five most identified barriers for both statewide results and Rochester results.

4.5 Selection of Interview Participant Quotes Highlighting Emerging Themes Regarding Identified Barriers Preventing Access to Nature

The following section defines the barriers identified by the interview participants and provides selected quotes to highlight emerging themes and how the participants view the impact of barriers on access to nature.

4.5.1 Transportation

Transportation was the most frequently mentioned barrier to accessing nature, identified by 13 of the 19 interview participants. Barriers related to the private ownership of a vehicle, reliance on private transportation, or public transportation services were included in the transportation category. Transportation related barriers may have been so frequently mentioned in part due to how the interview participants viewed natural assets in NH, with many destination assets identified that are a significant distance away from the most populated areas of New Hampshire.

From a transportation aspect, we live in a state that has very limited public transportation, from public bus systems to parking at trail heads. Some towns don't even have sidewalks, so if you don't have a car, it becomes a lot harder to access nature. When thinking about our kind of well-known natural areas they are completely inaccessible to anyone that doesn't have a car, creating an immediate barrier. – Nonprofit 6

“Transportation is a common barrier; I don't like that you have to drive everywhere. Walking in Rochester can be difficult, there's not a lot of sidewalks throughout the city to connect to outdoor recreation sites”. – Volunteer Committee / Board 2

“When you drive through downtown Rochester, you’ll see many residents using the coastal transportation bus, but these buses do not connect to many of the larger New Hampshire attractions”. – Business 1

“Bus stops often go to where we work and can get food, not necessarily where we can go enjoy nature or exercise”. – Government 3

The previous quotes illustrate the barriers and difficulties to accessing nature that transportation creates in New Hampshire. These quotes also display that many of New Hampshire’s public transportation options do not meet the needs of all individuals, creating a reliance on private transportation to access much of the state’s green space.

4.5.2 Cost to Individual

The cost to individual category of barriers is comprised of any financial burdens or expenditures required by the user to participate in a recreation opportunity or to access a natural asset. This category included mentions of such things as equipment cost, site access cost, or travel cost.

“Financial barriers such as equipment costs, travel, and lodging prevent engagement with specific activities”. – Government 1

“I think that depending on what people might individually want to be engaged with and what season it is, for example winter sports are expensive and can require specialized gear”. – Government 5

“Financial cost is also a barrier, there may be a fee to access some parks or to even park at the beach. Going camping or hiking can require supplies can cost money”. – Volunteer Committee / Board 2

“Another barrier can be the cost associated. For example, do you need to pay to park or pay to enter the site?”. – Nonprofit 5

The preceding quotes identify monetary restrictions and barriers that can prevent people from participating in recreation opportunities, whether because of the cost of entry to sites, the cost of equipment, or the cost to travel to a location.

4.5.3 Knowledge

The knowledge barrier category is relatively broad and captures barriers related to information or education. This includes difficulties finding or accessing information on natural assets, uncertainty of what is in the natural environment, or lack of information related to nature or nature access.

“There needs to be visible education to help people understand how they can use nature and what accessible opportunities are. People can do epic adventures, or they can find fully accessible hiking opportunities”. – Nonprofit 9

Many of the trails in these communities have been built to cater to their demographics versus the state as a whole. This adds to the lack of information of the trails. So, accessibility is not just who can even walk on the trail but who has the knowledge of the trail existing... There doesn't seem to exist a repository of existing trails throughout New Hampshire along with information about these trails. – Nonprofit 6

“For the underserved population, something as simple as going for a walk in the woods isn’t accessible. This is something that many of us take for granted. The underserved population don’t have the access or knowledge base to be able to find these resources”. – Government 4

“I’ve learned that there are fears that people have, from wildlife to the general unknown of what can be out in nature”. – Nonprofit 8

The previous four quotes discuss how lack of knowledge about nature and nature based opportunities can prevent and even discourage individuals from making use of and participating in outdoor nature based recreation and enjoyment.

4.5.4 Infrastructure

The infrastructure category refers to any barriers that were identified, related to, or pertaining to the physical structures within a natural asset. Infrastructure includes parking lots, restrooms, identification signs, or physical structures located within an asset.

“The infrastructure is outdated, antiquated or non-existent when comparing to other states that invest in these spaces. For example, parking lots aren’t adjusted for current use numbers...”.
– Nonprofit 2

“Accessing trail heads can even be an issue because there isn’t always enough parking”.
– Nonprofit 6

“We don’t have the infrastructure around it to support all the people coming to visit. We don’t have the parking lots, the signage, or even the porta-potties around the infrastructure to

support this access...The infrastructure isn't ready to absorb the next level of outdoor recreation promotion in New Hampshire". – Government 4

The preceding three quotes depict difficulties with accessing and utilizing existing green spaces and recreation opportunities due to failing infrastructure and facilities or these facilities and infrastructure not meeting standards.

4.5.5 Time

Time was identified as a unique barrier category to accessing nature. Any mention by interview participants of bandwidth or free time limiting one's ability to access nature was classified under this category.

"For example, the audience that I frequently work with is generally the old white retirees, because they have the time, money, bandwidth, and capacity to engage and enjoy. That's not to say others don't want to, it's just that some don't have the ability to. This is observed in who comes to talks and who comes to volunteer". – Nonprofit 3

"If you are a single parent with two jobs, you might have a harder time getting up to the white mountains. Someone with fewer life responsibilities will be able to get outside and enjoy New Hampshire's recreation opportunities". – Business 2

"It's easy to pretend that to go outside you only need a pair of sneakers, but you actually need time and money to get outside, which can be hard for disadvantaged communities". – Nonprofit 8

“Time is a major barrier too, there are some people who are working more hours a week than is healthy or reasonable, so they can’t focus on ways to improve their quality of life and health or even think about recreating or being outside”. – Business 3

The four preceding quotes discuss how free time impacts one’s ability to access nature, whether because of too many life responsibilities or too long working hours.

4.5.6 Americans with Disabilities Act (ADA) Compliance

Compliance with the Americans with Disabilities Act was identified as a distinct barrier to accessing nature, as it captured a specific aspect of nature access. Only mentions of ADA compliance or improving trails to meet wheelchair accessibility specifically for ADA compliance were included in this category. This category does not cover general accessibility of sites.

“ADA compliance issues are some of the biggest roadblocks we’re encountering with accessibility of nature”. – Government 2

“Conservation commissions seem to be afraid of discussing ADA compliance trails due to the cost of building and maintaining these trails”. – Nonprofit 6

The previous two quotes discuss how trails not meeting the standards or compliance with the Americans with Disabilities Act can actively prevent individuals from being able to recreate and benefit from natural assets throughout the state.

4.5.7 Funding

Funding related barriers were considered a separate barrier category than cost to individual, as funding covered all financial costs and expenditures of an organization that

provides access to nature or recreation opportunities. The funding category does not include any mentions of financial responsibilities of nature access or recreation incurred by individuals using the natural asset.

“Historically, funding has had an impact on the ability for city and state parks to be built. The lack of taxes or funding sources make it difficult for land management agencies to provide recreation experiences for everyone”. – Nonprofit 1

We also have been experiencing barriers to getting funding through grants. We’ve encountered roadblocks with previously approved grants due to extraneous circumstances with the proposed site. We’ve also been denied grants due to the property not being owned by the city. We want to use the grants to help fund our proposed projects because the community will get upset if we spend money that causes an increase in taxes. – Government 2

“Some communities have smaller internal budgets or are less successful with their grant applications...”. – Government 5

The three preceding quotes outline how budgets and funding issues prevent communities or agencies from being able to create recreation opportunities or to keep existing natural assets up to their expected standards.

4.5.8 Proximity / Distribution of Sites

Proximity and distribution of sites was made a separate category from transportation, as it captures a different and particularly interesting aspect of access opportunities. As described in the opening fictional scenario, even when a natural asset is nearby, people may not be able to easily access the site. Physical obstacles, such as highways, or even the absence of assets or recreation opportunities for certain communities can limit access.

“Proximity and distribution of the sites. For example, do you have access within ten minutes or one hour? Are the sites walkable or do you have to drive?”. – Nonprofit 5

This participant quote highlights that the proximity of natural assets and the distribution of these assets can prevent people from accessing these resources, as they may require significant travel times to utilize or may not be accessible by walking.

4.5.9 Sense of Belonging

The sense of belonging barrier category was used to describe any mentions of whether a natural asset was viewed as welcoming or accepting for those that want to utilize the asset. It was also used to describe situations where someone may feel uncomfortable or unwanted by local populations or other users, when trying to access nature.

“...feeling like you are welcomed or that you belong in a certain space is also a barrier. There’s a local versus outsider dynamic in this region”. – Nonprofit 5

“There are some barriers to access some lakes that don’t have public boat launches... affluent people don’t want people from outside using this resource...”. – Volunteer Committee / Board 1

The two preceding participant quotes depict that individuals may not feel welcomed to access natural assets or resources by the local community or land management entity.

4.5.10 Definition of Nature

This category describes barriers identified by interview participants related to how society or individuals define and view the natural world and nature. Interview participants used

this concept to describe barriers to nature access being created by individuals and society when local greenspaces are not identified as a natural asset.

“It’s also interesting to think about what we socially define as nature. We tend to view nature as “wilderness” and ignoring the nature that exists around us from your yard to public parks”. – Nonprofit 6

“I think there is a view that you have to go out into the wilderness to enjoy nature, but some people just want to have a picnic with a scenic view”. – Nonprofit 8

The previous two participant quotes capture how many individuals may not perceive that by accessing backyard nature and nearby green spaces, such as community parks, they are, in fact, accessing natural assets and nature.

4.5.11 Environmental Justice

The concept of environmental justice being a barrier to accessing nature was only mentioned by one of the participants. They used environmental justice as an umbrella term to capture impacts to populations caused by existing infrastructure, such as highways creating physical barriers preventing certain populations from accessing assets, but also a belief that funding in New Hampshire may not be evenly distributed between communities.

There is also a lack of environmental justice. Are there assets that aren’t bifurcated by highways, are they truly invested by available funding? For example, poor public transportation access throughout New Hampshire. Historically, funding has had an impact on the ability for city and state parks to be built. The lack of taxes or funding sources make it difficult for land management agencies to provide recreation experiences for everyone. – Nonprofit 1.

This participant quote captures that a lack of environmental justice prevents individuals from accessing nature and assets because of a historical lack of funding for certain communities, as well as poor public transportation not meeting the needs of communities, and a lack of funding for land management agencies to remedy these issues.

4.5.12 Land Ownership

Land ownership related barriers were categorized by a common theme of access to nature being impacted specifically due to the property owner or manager.

“We’re trying to get a grant to create ADA accessible trails, however we’ve run into a roadblock because it’s conservation land that isn’t owned by the city”. – Government 2

This participant quote discusses how land ownership can create a barrier to nature access opportunities, as their organization was not able to conduct maintenance and improvements on a trail that they manage, because the property itself had a different owner, creating legal issues.

4.5.13 Marketing of Recreation

Marketing of recreation was given a unique barrier category, despite only being mentioned by one interview participant. This is because it captured a unique aspect of nature access, that by not having representation of all demographics in marketing campaigns, it could prevent the unrepresented group from recreating or accessing nature.

“...better marketing in the state that shows representation of various demographics, if you have a disability but never see yourself represented, you may not feel like those opportunities exist for you”. – Nonprofit 9

This participant quote highlights the lack of representation in marketing of outdoor recreation opportunities in the state, which creates a barrier to accessing nature, as individuals that lack representation may not feel welcomed or that they belong in these spaces.

4.6 Expanding Access to Nature

The sections below cover three related interview questions that capture a common theme of expanding access to nature. The interview participants were asked if there are ways in which their organizations' efforts aim to expand access for those with limited access, if they engage or partner with those with limited access, and about the challenges their organization faces when trying to expand access to nature.

4.6.1 Expanding Access to Nature for Groups with Limited Access

Two follow up questions related to expanding access to nature for those with limited access and whether they engage or partner with those with limited access were posed to 17 of the 19 interview participants. These follow up questions were not asked to the two nonprofit participants who believed everyone to have access to nature, where one participant stated, "...we don't really look at that, but we do try to list resources where people can find information. I think New Hampshire on a whole, is doing a good job to save and create recreation spaces for people." Of the 17 interview participants that were asked these follow up questions, 13 stated that their organization has made efforts to expand access to nature for those with limited access. Table 4.2 shows the various efforts these organizations are taking to expand access to nature, in addition to the number of organizations engaging in these types of efforts. There appeared to be some variation in efforts between the different participant organizations, with only three of the eight types of expansion efforts being mentioned by more than one of the participants.

The most frequently mentioned effort was a focus on Diversity, Equity, and Inclusion (DEI) initiatives, with four of the 13 organizations engaging in DEI related work (Table 4.2). Regarding DEI efforts, one nonprofit participant stated, “Part of our DEI investment is focused on a partnership with chapter leaders from each state to make sure that we’re creating programs, outreach, and activities that are reaching more than just the typical user”. The next most common program to expand access to nature was a focus on expanding recreation opportunities, which was mentioned by two of the 13. One government participant stated, “We’re continuously looking at adding stuff to get people outdoors, get them healthy, and to enjoy the natural assets Rochester has.” Also mentioned by two of the 13 organizations, was a focus on making trails ADA compliant or more accessible in general, with one government participant stating, “Working on creating trails that are ADA compliant in addition to building up the community, so people have access.”

| Table 4.2. Organizational Programs to Expand Access to Nature and Number of Times Mentioned. | |
|--|---|
| Diversity, Equity, and Inclusion | 4 |
| Expanding Recreation Opportunities | 2 |
| ADA Compliant Trails / Trail Accessibility | 2 |
| Adopt-A-Spot | 1 |
| Connecting College Students with Volunteer Opportunities | 1 |
| Sponsored Outdoor Events | 1 |
| Adaptive Equipment Rental | 1 |
| Advocacy | 1 |

4.6.2 Expanding Access to Nature for Groups with Limited Access and Rochester

The Rochester interview participants were not specifically asked to identify programs to expand access to nature only within Rochester, but instead asked about the programs they use to expand access to nature, regardless of location. Five of the nine Rochester interview participants stated that they or their organization operates programs attempting to expand access to nature, with the other four stating that they did not have programs with this goal in place.

4.6.3 Challenges Faced When Organizations Attempt to Expand Access to Nature.

17 of the 19 interview participants stated that they or their organization faces challenges while trying to expand access, with the other two participants stating that they do not experience any specific challenges in trying to expand access.

Table 4.3 displays the challenges identified by the interview participants as well as the number of times it was mentioned by the participants. Many of the challenges faced by the organizations, appear to be shared between all organizations, as over half, 11 of 19, participants experienced challenges related to lack of funding and around a third (seven of 19) participants experienced “bandwidth” related challenges. Lack of funding was the most frequently mentioned challenge, mentioned by 11 of the participants, with one government participant stating, “Lack of resources again and lack of funding. People choose to live here and visit here because of the assets we have, but we need the resources to support that infrastructure and contribute to the economy. Difficult to maintain natural assets in New Hampshire due to lack of funding.” The second most mentioned challenge was that of bandwidth, which was identified by seven of the 19 participants. The term “bandwidth” was used by numerous participant organizations, referring to one’s time, energy, mental ability, or lack of work hours to dedicate to handling additional

tasks, responsibilities, or other issues. One nonprofit stated, "...we're a small team, so there is only so much work we can take on as an organization. A lot of project management and balancing what projects should be a priority."

| Table 4.3. Challenges Faced by Organizations When Expanding Access to Nature and Number of Times Mentioned. | |
|--|---------------------------|
| Challenges | Number of Times Mentioned |
| Lack of Funding | 11 |
| Bandwidth | 7 |
| Lack of Resources; Difficulty Reaching Target Audience | 3 |
| Workforce; Infrastructure; Welcoming Atmosphere; Lack of Volunteers | 2 |
| Resource Degradation; "Old Guard" Mentality; Cost of Maintenance / Management; COVID; Transportation; Previous Direction of Organization; Wetlands Requirements; ADA Requirements; Development; Difficulty Proving Economic Benefit; Pushback from Partner Organization; Opportunity; Lack of Readiness; State Government Restrictions; Private Ownership of Land; Pushback from Cities; Permits | 1 |

4.6.4 Challenges Faced When Organizations Attempt to Expand Access to Nature and Rochester

The Rochester interview participants were not specifically asked to only identify challenges they faced when attempting to expand access to nature within Rochester, but instead

asked what barriers they faced when attempting to expand access to nature, regardless of location. Eight of the nine Rochester interview participants stated that they experience some type of challenges when trying to expand access to nature. Table 4.4 shows that the Rochester participants appear to share many of the same challenges when attempting to expand access to nature, because lack of funding and bandwidth related challenges were experienced by almost half of the interview participants. Five of the nine participants mentioned lack of funding and four of the nine participants mentioned bandwidth related challenges.

| Table 4.4. Challenges Faced by Rochester Organizations When Expanding Access to Nature and Number of Times Mentioned. | |
|---|---|
| Lack of Funding | 5 |
| Bandwidth | 4 |
| Wetlands Requirements; ADA Requirements; Lack of Volunteers; Development; Difficulty Proving Economic Benefit; Opportunity; Lack of Readiness; Difficulty Reaching Target Audience; State Government Restricting Access to Public Lands; Private Ownership of Land; Pushback from Cities; Permits | 1 |

4.6.5 Challenges Faced When Organizations Attempt to Expand Access to Nature; Statewide Results Compared with Rochester Results

Comparing the results from Table 4.3 and Table 4.4 show that the challenges that New Hampshire based organizations experience when trying to expand access to nature appear to be similar, potentially reflecting shared experiences and struggles.

4.7 Improving Economic Vibrancy in Community

This section is comprised of three thematically similar questions, related to improving economic vibrancy in the community and tracking impacts of organizations' work on the economy. These questions helped to provide understanding of how organizations relate their work to the economy and if strengthening the economy is a primary focus for their actions.

4.7.1 Expanding Access to Nature with the Goal of Improving Economic Vibrancy in Community

When the interview participants were asked if their organization had identified opportunities to expand access to nature with the explicit goal of improving economic vibrancy, 12 of the 19 participants stated yes and identified some of their organization's efforts. One government participant stated, "We have conversations with communities and small businesses about how to look in backyard and find an asset. Outdoor recreation can be a tool to attract workforce, revitalize communities, this is a forefront of [Government Office's] goals." Four of the 12 participants stated that while improving economic vibrancy wasn't an explicit goal of their organization, it is either a byproduct or at least a consideration. A nonprofit participant in this category said, "...indirectly, our role is to help people understand that accessing the outdoors is possible...we hope people can eventually utilize these resources independent of us." Three of the 19 participants stated that their organization has not identified opportunities to expand access to nature with the explicit goal of improving economic vibrancy.

4.7.2 Expanding Access to Nature with the Goal of Improving Economic Vibrancy in Rochester

In addition to asking about efforts to improve economic vibrancy in the state, the nine Rochester interview participants were also asked if they or their organization has identified opportunities to expand access to nature with the goal of improving economic vibrancy within Rochester. Seven of the nine participants identified their organization's efforts to expand access to nature with the goal of improving economic vibrancy. One volunteer committee member stated, "It originally started as an economic development endeavor before expanding its scope to include nature access and recreation. The original idea was to bring more people into the community and in to downtown and spend money. Now nature is seen as a major draw for people, so increasing access can positively impact the economy." Two of the nine respondents answered no to the question, although they elaborated that even if improving economic vibrancy was not at the forefront of their goals, it was something tangential or a positive secondary outcome, although sometimes at odds with their conservation focused goals.

4.7.3 Access to Nature and Economic Recovery from the COVID Pandemic.

To better understand how organizations utilize the economic benefits of nature access, interview participants were asked if their organization was involved in efforts to expand access to nature, focused on the economic recovery from the COVID pandemic. In response, 16 of the 19 participants stated that their organization is not involved in efforts to expand access to nature focused on economic recovery from the COVID pandemic. Of those 16 participants, some stated that while their organization is focused on economic recovery from the COVID pandemic, they weren't focusing on or addressing access to nature within their efforts. Some of the other

participants said they are focusing on expanding access to nature, but they aren't concerned about economic recovery from the COVID pandemic. A nonprofit stated, "From an economy perspective, we aren't focused on generating income, we are focused on getting people outside." Three of the 19 participants stated that their organization is involved in some efforts to expand access to nature focused on economic recovery from the COVID pandemic., with a government participant, stating, "...there is an Economic Recovery and Expansion Strategy... it sets the groundwork for saying we need to recover from the pandemic as well as being resilient. How can we maintain that resiliency and maintain economic stability and growth as we move forward?... focusing on outdoor recreation and outdoor recreation economy."

4.7.4 Access to Nature and Economic Recovery from the COVID Pandemic and Rochester

While the Rochester interview participants were not asked this question specifically regarding the city, none of the nine participants stated that their organizations were involved in any efforts to expand access to nature focused on economic recovery from the COVID-19 pandemic.

4.7.5 Impact of Work on the Economy

To understand how organizations connect and intersect their work with the nature economy, the interview participants were asked if they tracked their work involving natural resources in New Hampshire and the impacts on the local, regional, or state economy. Only one of the 19 participants stated that their organization directly tracks economic impacts to local, regional, or state economy, with the nonprofit participant stating, "I do have colleagues that can track direct impact value, such as number of jobs created, or the number of fish spawned and sold." Three of the 19 participants, all businesses, stated that while they do not track how their

work impacts the economy overall, they keep various levels of detailed sales and stock information for their businesses. 15 of the 19 participants stated that they or their organization does not track how their work impacts the local, regional, or state economy. Although they may not actively track impacts to the economy, multiple organizations identified this information as being useful and beneficial in various aspects of their operations and goals, with one nonprofit stating, "...it would be beneficial and informative for our efforts and events we put forward to improve outreach and inclusion."

4.7.6 Impact of Work on Economy of Rochester

The nine Rochester participants were asked if they track how their work involving natural resources impacts the state economy and also, specifically, the Rochester economy. None of the nine Rochester interview participants track how their work impacts the local, regional, or state economy. However, three of the nine participants, which were all businesses, track sales data and information about their stores even if they do not track how it impacts the economy at any level.

4.8 Demographic Data

To better understand how the participant organizations identify and target underserved populations that have limited access to nature, the interview participants were asked if they collected any demographic data, such as age, race, gender, income, or education level. Only seven of the 19 participants stated that they or their organization collects demographic data, with one nonprofit participant stating, "We do collect the demographic data of those we serve as clients. As of right now, nothing has been done with this information though. One of my main goals is to generate an impact report of our work, as we have never done one." 12 of the 19 participants stated that that they do not collect demographic data, although multiple

organizations identified this information as being useful for their efforts and actions, with one nonprofit participant stating, "...we have been advocating for the aggregation of this data to a local or county level. This would be helpful in measuring impact, charting progress, and it also helps with advocacy. This would help to show state legislatures the impact their constituents are experiencing." Additionally, some of the organizations that do not collect demographic data discussed utilizing publicly available demographic data, data from partner organizations, or they expressed their interest in acquiring data to improve the effectiveness and reach of their organization.

4.8.1 Demographic Data and Rochester

The nine Rochester interview participants were not asked if they specifically collected demographic data for their efforts in the city, but instead if they collected demographic data at any level. Eight of the nine participants stated that their organizations do not collect demographic data. One of the nine participants, a business participant, stated that they do collect demographic data but only for merchandising and stock purposes, stating, "We collect a lot of different metrics because we need to know our demographic for sales needs."

Chapter 5: Discussion

This chapter will discuss the importance of the research findings and provide recommendations to improve access to nature.

5.1 Introduction

This research aimed to benefit NH's underserved communities and the State as a whole, through individuals and organizations advocating and making positive changes for communities and environmental justice efforts. The findings lay a foundation for understanding existing barriers to accessing nature in NH and suggest steps organizations could take to remove barriers and implement opportunities for nature access.

With almost half the interview participants stating they believe not everyone in New Hampshire has equal access to nature and all participants identifying numerous barriers preventing access to nature, it is clear that some aspects of accessing nature in NH should be addressed for the improvement of environmental justice and quality of life for the communities in the state. This lack of environmental justice within NH is especially apparent, due to a lack of state laws requiring any consideration of environmental justice efforts from government organizations (NHDES, 2022). Therefore, the results of this study may be especially useful for the New Hampshire Department of Environmental Services (NHDES), which recently issued a statement on environmental justice that specifically highlights decreased access to green spaces for overburdened communities, as well as indicating efforts to improve environmental justice principals within their organization, as a means of correcting existing disparities (NHDES, 2022).

While the primary objectives of the study were to understand barriers and opportunities of access to nature and its benefits within New Hampshire, invaluable information was gained about the needs and interests of organizations that operate within the nature economy and natural resources related industries. Throughout the course of the interviews, it became increasingly clear that NH has an abundant diversity of natural capital and resources, and the interview participants and their organizations, are interested in quantifying this value across various sectors. The interview participants reported nature and natural resources as being defining characteristics of the state's way of life, with nature access being a reason many people choose to live and work in NH. Another aspect that emerged over the course of the interviews, was that of the importance of framing questions for the interview participants. When comparing the results of the Rochester participants for both their statewide and Rochester specific answers, it became clear that if you want more specific answers about local assets and resources, the question should be framed about specific places. A difference in the types of benefits emerges depending on whether interviewees discussed statewide or nearby resources, with interviewees focusing more on the recreation value of assets at the statewide level and the aesthetic value of nearby natural assets.

The interviews and data analysis identified three key findings that connect many aspects of nature and the organizations that operate within New Hampshire's nature economy. These themes are barriers to accessing nature, access versus proximity, and partnerships, which will all be explored in greater detail.

5.2 Barriers to Accessing Nature

Due to the large number of barriers identified by the interview participants, I focus here on the barriers most frequently identified by the participants, as it is likely that the frequency of identification reflects the common nature and general impact of these barriers. The four most mentioned barriers, found in figure 4.7, transportation, cost to individuals, knowledge, and infrastructure related barriers could be great starting points for focusing efforts to improve nature access and further environmental justice.

While few studies focus on transportation and nature access, numerous studies that identify transportation as a barrier to community involvement, access to healthcare, healthy food options, as well as job opportunities, with underserved communities facing the greatest impacts (Dillahunt & Veinot, 2018; Hartell, 2008; Yang et al., 2006). Based on existing research on transportation limiting various quality of life aspects, combined with this research's findings regarding transportation in NH, transportation is a major barrier to accessing nature that requires intervention and action to correct.

Recommendation: Future research and policy actions could investigate transportation alternatives to reduce reliance on private vehicles for accessing nature in New Hampshire.

Research identifying financial costs, or cost to individuals, as a barrier to accessing nature was also difficult to find, with only a few publications. One such study, identified a lack of access and funds to travel to desirable outdoor spaces as a barrier that prevents time in nature (Sefcik et al., 2019, p. 7). In addition, a report published by the Center for American Progress found that 70 percent of low-income communities, in the United States, live in nature-deprived areas (Rowland-Shea, et al., 2020, p. 6). With such a high percentage of low-income

communities lacking access, and so many interview participants identifying costs to individuals as a barrier to nature access, there is a strong case to justify action, outreach, and programs to mitigate the cost of recreating in nature or even to provide free rental gear for the underserved populations to enjoy nature.

Recommendation: Develop strategies to reduce time and financial costs associated with nature access.

The North Carolina Cooperative Extension Service has previously identified lack of knowledge as a barrier preventing urban communities from accessing wildlife and nature (Floyd et al., 2016, p.14-15). The lack of knowledge or knowledge gaps can be seen as barriers that prevents access to nature statewide, especially when multiple interview participants discussed the need for a repository or database of recreation and access opportunities in NH. Compiling the fragmented and separated databases that exist could be a first step toward creating a database that covers entire regions or the entire state. However, there could be some pushback from some organizations, as some interview participants mentioned difficulty in getting partners to share or publicly release information related to their recreation opportunities.

Recommendation: Create a unified repository or website identifying recreation and nature access opportunities.

There also does not exist much published literature on infrastructure preventing access to nature. However, the North Carolina Cooperative Extension Service identified facilities or infrastructure of a recreation location as a barrier to preventing urban communities from accessing wildlife and nature (Floyd et al., 2017, p.15). Similarly, many of the interview participants in this research identified infrastructure related issues as a barrier.

Recommendation: Connect investments in infrastructure improvements to expanding nature access.

5.3 Access versus Proximity

Another finding identified during the interview process, was that of differences between accessibility and proximity of natural assets. While on initial assessment, it may appear that by being close in geographic location or proximity to natural assets means that a community is able to access it, many of the interview participants denied this notion. These participants identified that barriers exist that prevent an individual from gaining access to a location, even if it is physically close to them. Whether those barriers are physical, like highways preventing a community from walking to a site, or from financial barriers, like entrance and parking fees preventing access to a recreation site. The findings from the interview participants are supported by a few studies. One such study, from the University of Edinburgh, found that by reducing distance or even making more green spaces available, it does not fix existing access issues for groups of people (Szaboova et al., 2020, p.245). These findings, supported by existing literature, show that the barriers that prevent access must be addressed before accessibility and justice efforts can be achieved. If time constraints and financial costs create barriers preventing individuals from accessing green spaces, cultivation of green spaces through flowers and plants in ones' backyard allows for an easier and more accessible level of nature. A different study looking at the association of nearby green spaces and self-reported health found lower rates of stress and depression when individuals are exposed to nearby green spaces, such as domestic gardens or community parks (Krols et al., 2022).

Recommendation: Raise awareness of and strengthen access to backyard and nearby nature.

5.4 Partnerships

The concept of partnerships, discussed as both a positive opportunity as well as an operational challenge when working to expand access to nature, was frequently woven throughout many of the participant responses. Partnerships acting as both a positive and a negative is consistent with findings from previous studies regarding inconsistencies in terms of collaboration, coordination, and cooperation for partnerships (Margerum & Robinson, 2015). Literature shows that governmental agencies often experience challenges related to speed of decision making, strategic planning, and engagement in governance structures (Cairns & Harris, 2011, p.312). Nonprofit organizations must work with governmental expectations and operational norms, cope with rapid growth, as well as retaining a focus on their own long-term sustainability and independence (Cairns & Harris, 2011, p. 312). Both types of organizations have been found to experience challenges with understanding institutional norms and environmental pressures, as well as difficulty sharing information and finding appropriate joint decision making mechanisms (Cairns & Harris, 2011, p.312).

While many of the organizations discussed challenges related to operating within partnerships, this did not stop them from striving to continue to work together, even if the best intentions do not always lead to success. One aspect of partnerships mentioned by a nonprofit respondent, was that of limited funding creating competition and scarcity of resources between the partners. Funding creating challenges for partnerships and networks is a theme discussed in literature, however, it usually refers to accountability and reporting between a nonprofit organization and a government partner funding the work (Cairns & Harris, 2011, p.316). Funding exists as a challenge for nonprofit organizations in NH, although it may have less to do with accountability, and more to do with the tax structure of the state limiting funding and

resources for these groups. For example, one of the nonprofit participants discussed how they believe that nonprofit organizations in New Hampshire may not always be fully forthcoming with other organizations, because they are competing for these limited resources.

Despite any challenges, however, there are numerous benefits to forming partnerships and working with organizations from different sectors and backgrounds. Whether those benefits relate to additional perspectives and concepts or sharing of resources and information, collaboration can be used to solve problems thought too difficult to address. A review of cross-sector partnerships found that they are useful for solving economic, social, and environmental problems through collaborative efforts, and that the benefits that are realized can be innovative and novel (van Tulder et al., 2016, p.1-2). Additionally, a review of government and nonprofit collaboration accomplishments showed that by forming partnerships, both organizations were able to save money, secure additional funding, and increase the quality and level of community services and programs (Gazley & Brudney, 2007, p.402). In contrast to the challenges that organizations may face when attempting to form partnerships, literature shows that by collaborating with one another, organizations will be able to accomplish more and have a greater impact on equity and justice issues within New Hampshire.

Recommendation: Learn from and strengthen New Hampshire partnerships between organizations within the nature and nature economy space.

5.5 Limitations

This study aimed to identify and understand benefits, barriers and opportunities for accessing nature in NH, in addition to how access to nature impacts environmental justice. Results generated from this study are only indicative of the period the research was conducted

and the perspectives of the interview participants. The number of interview participants across organizational categories (e.g., government, nonprofit, business, volunteer committee) was unequal, which could affect the frequency of specific responses. Expanding the total number of interviews could allow for greater differentiation of results by organizational type and help assess whether and how organizational type impacts the results. While this research was limited to NH, replicating the research elsewhere or in other NH municipalities would provide insights into how generalizable the results are.

Chapter 6: Reflections

Over the course of my graduate studies at the University of New Hampshire, I learned numerous lessons and take-aways from my successes and, most importantly, challenges I experienced. It is vital to understand that you will experience challenges. I found it helps to take a step back and reframe how I was tackling the problem. Your advisor and your committee are there for you and are a great source of support and advocacy.

Before beginning the interviews, I wish I had worked more to develop active listening skills, as I believe that I missed potentially interesting details or information from the participants by not following up on more of what they said. If I could do the interviews over again, I would create a list of themes and core details that emerged from each interview, for review for all subsequent interviews. I think this would have helped me identify frequently mentioned themes earlier, before data analysis, which would have helped me while I was still interviewing.

Although, I could write countless pages on what I believe I could do better after my time at UNH, I think the most important thing I learned was that of collaborating with others. My thesis is directly a product of my time working with the Nature Economy Collaborative, working with my committee members, getting feedback from my Environmental Policy, Planning, and Sustainability lab (EPPS Lab) colleagues and from the interviews with participants. Without people working with one another toward achieving a common goal, research would stall indefinitely. What I will carry with me through life is my understanding of just how important collaboration is and a willingness to always help others.

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APPENDICES

Appendix A: Access to Nature and Its Economic Implications Info Brief



MAKING LIFE **BETTER** IN NEW HAMPSHIRE

Access to Nature and Its Economic Implications

A Nature Economy Info Brief

Background on Issue

Access to the natural environment is a critical element of the economic, social, and ecological resilience of communities (Rogers & Garlick, 2021). In New Hampshire, outdoor recreation contributes an estimated \$2.5 billion dollars yearly to the economy (BEA, 2019), which at 3.2% rivals the economic impact of the state's entire food and accommodations sector. Nature's role in broader economic development and quality of life is even larger and is one of the State's greatest advantages for business, workforce attraction, and youth retention, becoming even more apparent during the global pandemic. Before the COVID-19 pandemic, outdoor recreation was increasing in popularity throughout the United States, with 154 million Americans participating annually (Outdoor Foundation, 2020). Throughout the pandemic, outdoor recreation participation rates have increased even further.

Over the last two years, New Hampshire has experienced record recreation and tourism visitation, soaring home prices, and growing and thriving rural communities and economies as visitors and new residents want greater access to nature and a less crowded lifestyle. These changes create opportunities, but also pose potential challenges for the State, including land use conflicts, a lack of available and affordable housing, and workforce gaps.

Exploring Access to Nature through Interviews

We conducted 19 interviews with people involved in nature economy, economic development, recreation, and community development sectors, including representatives from New Hampshire state and local government agencies, city committees and volunteer boards, nonprofit organizations, and local businesses. We focused part of the research on Rochester, NH, a community that is working on supporting access to nature for economic development and quality of life in some unique ways. Our interview questions asked about how people use and value nature and how access to nature impacts economic issues.

Interview Questions

1. Please describe your position in your organization and how your work relates to New Hampshire's economy as it relates to the use and value of nature (trails, parks, rivers, etc.).
2. When you consider NH's natural assets – what comes to mind?
3. From your perspective, do you think everyone has access to nature? If not, what barriers exist? If so, what and how is data tracked and collected?
4. Have you or your organization identified opportunities to expand access to nature with the goal of improving economic vibrancy in the community / New Hampshire? Can you tell me about your efforts?
5. Is your organization involved in any efforts to expand access to nature focused on economic recovery from the COVID pandemic?
6. What kinds of challenges does your organization face in trying to expand access? Examples?
7. How do you view the impact of your work on the economy?
8. Do you track how your work involving NH natural resources impacts the local, regional, or state economy?

Major Themes

Among New Hampshire’s natural assets, interview participants most frequently mentioned water-based resources and mountains (18 of the 19 participants mentioned both). As one government participant stated, “We are so lucky to have a sea-coast in addition to the White Mountains...We have beautiful lakes, rivers, and mountains, as well as our seacoast. It’s the backbone of our natural assets”.

Interview participants varied in how they defined what it means to access nature. For example, one business participant stated, “We believe that selling plants and flowers is a way to bring nature to their own living space and get the benefits of nature.” In contrast, a nonprofit participant stated, “[Nonprofit Organization] has identified several opportunities to improve and expand access to nature by cutting and maintaining back country skiing glades on private and public land and allowing public access.”

Interview participants had mixed opinions about whether everyone in New Hampshire has access to nature; 9 of the 19 participants said they don’t think everyone has equal access to nature. However, all 19 interview participants identified barriers that prevent people from accessing nature in New Hampshire (see table 1). The most frequently mentioned barrier was transportation.

Nine participants identified the limited availability of sites that are compliant with the Americans with Disabilities Act (ADA) as a barrier. One

government participant stated, “ADA compliance issues are some of the biggest roadblocks we’re encountering with accessibility of nature”. In addition, a nonprofit participant stated, “Conservation commissions seem to be afraid of discussing ADA compliance trails due to the cost of building and maintaining these trails”. When discussing issues leading to inequitable access, participants also mentioned that it can be hard to find where recreation sites are, recreation sites may not be close by, and sites may lack trailhead parking and facilities. Eight participants identified cost as a barrier to participating in outdoor recreation activities.

All 19 participants described some way in which their work impacts the economy. One nonprofit participant, for example, stated, “...we commissioned an economic impact study four years ago. Three of our ski glades contributed over \$1 million to the economy and 16 full time jobs over the course of just one season”. Similarly, a business participant said, “We’re a driver or a catalyst of the local economy, but it is mutually beneficial. Some people are coming to Rochester specifically for [Business], not always for any other reason”. Two participants track how their work impacts the economy, with one nonprofit participant stating, “...we do some survey work to collect some data, like how much money is spent on local food, what local food did you buy, how did you use the local food in school programs, what farm did you buy the local food from”. Three participants said

Table 1: Frequency of Barriers Identified by Interview Participants

| Barrier | Number of Times Mentioned |
|----------------------------|---------------------------|
| Transportation | 13 |
| Site Characteristics / ADA | 9 |
| Financial | 8 |
| Information | 5 |
| Time | 5 |
| Infrastructure | 2 |
| Environmental Justice | 1 |
| Sense of Belonging | 1 |

“From a transportation aspect, we live in a state that has very limited public transportation, from public bus systems to parking at trail heads. Some towns don’t even have sidewalks. So, if you don’t have a car, it becomes a lot harder to access nature”.

- Non-profit and business participant



Shaded walking path along river with bistro style seating, offering a moment of respite to sit in the shade and admire the natural beauty.

“...we have been advocating for the aggregation of this data to a local or county level. This would be helpful in measuring impact, charting progress, and it also helps with advocacy. This would help to show state legislatures the impact their constituents are experiencing”.

- Non-profit participant

they collect demographic data about clients who are accessing nature related to their work. Four of the interview participants said they would be interested in demographic data about who is accessing nature.

11 of the interview participants said they believe their organization is involved in efforts to expand access to nature with the goal of improving economic vibrancy in their community or New Hampshire. One government participant said, “Yeah, right ow we are working on a grant to create an ADA compliant walking trail within one of the [City] recreation areas”.

7 of the interview participants said they believe their organization is involved in efforts to expand access to nature focused on economic recovery from the COVID pandemic. One of the government participants stated, “Yes, so there is an Economic Recovery and Expansion Strategy, referred to as ERES. ERES sets the groundwork for saying we need to recover from the pandemic as well as being resilient”.

All 19 participants described some way in which their organization experienced challenges when trying to expand access to nature. What kinds of challenges does your organization face in trying to expand access. One nonprofit participant stated, “One is internally, bandwidth or capacity. It is difficult to find people to bring into the fold or to retain workers. The other challenge to expanding access is caused by a succession issue with sitting leadership. It is difficult to get people to move away from the “old guard” mentality for leadership positions in many different municipalities and groups making it difficult to bring in new ideas and concepts”.



Adopt-a-spot location close to downtown showcasing beautiful flowers and welcoming appearance.

Actions Communities Can Take to Improve Access to Nature

Based on the interviews, we identified several recommendations for how to improve access to nature and support local economies in New Hampshire.

- Make it easier to locate information about the accessibility of State Parks, for example through an online website or database.
- Initiate discussions on how to reduce and remove barriers to accessing nature.
- Form connections to nature where people are: backyards, downtown greenspaces, and community spaces. Nature doesn't have to be something "wild" or difficult to access.

- Better connect access to nature and economic development. Bring together groups that work on these topics but are often siloed for dialogue about connection between their work.
- Collect data about: (1) the demographics of who is accessing nature and how, and (2) how organizations' work impacts the economy.

These are some of our preliminary suggestions for improving access to nature. We look forward to hearing from other communities across the state and region about their ideas, suggestions, and success stories.

For More Information

- [The Nature Economy Collaborative – University of New Hampshire](#)
- [Outside Our Doors: The benefits of cities where people and nature thrive. – The Nature Conservancy](#)
- [Recreation Economy for Rural Communities – Environmental Protection Agency](#)
- [Urban Nature For Human Health and Well-being – United States Department of Agriculture](#)

About the Author

Cody Crytzer is pursuing the NREN Natural Resources and the Environment M.S. at the University of New Hampshire with an interest in environmental justice and access to nature.

Shannon Rogers, Ph.D. serves as the State Specialist of Nature Based Economic Development on the Community and Economic Development Cooperative Extension Team at the University of New Hampshire. Dr. Rogers is also an Associate Extension Professor and is affiliated with the Natural Resources & Environment Program at UNH.

Catherine Ashcraft, Ph.D. is an Assistant Professor in the Natural Resources & Environment Department at the University of New Hampshire. Dr. Ashcraft is interested in the human dimensions of ecological systems. She focuses on how environmental policies and institutions are negotiated and designed, how they respond to change, and are renegotiated.

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Appendix B: Eight Ways Nature Supports New Hampshire's Economy Info Brief



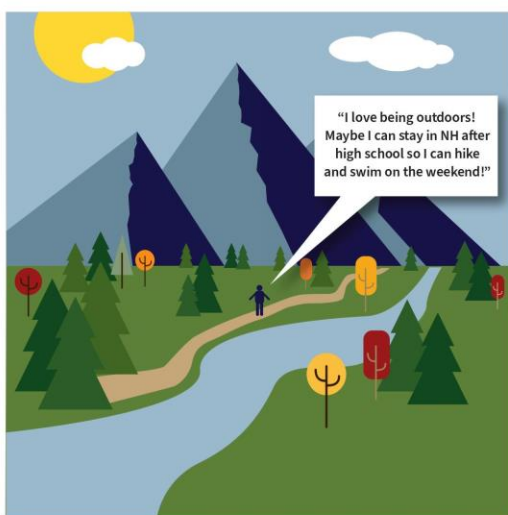
MAKING LIFE **BETTER** IN NEW HAMPSHIRE

Eight Ways Nature Supports New Hampshire's Economy

Nature Economy Information Brief July 2022

Financial, built, and human capital support our economies. But what about natural capital? Nature and its services provide important benefits and utilities that, if stewarded carefully, annually renew and support sustainable economic development in communities.

In the following information brief we share eight ways that nature supports New Hampshire's economy. These ideas are shared below in cartoon format to maximize accessibility and interest. We hope they will spark discussion and future planning and decision-making to incorporate nature in sustainable ways into economic development discussions.



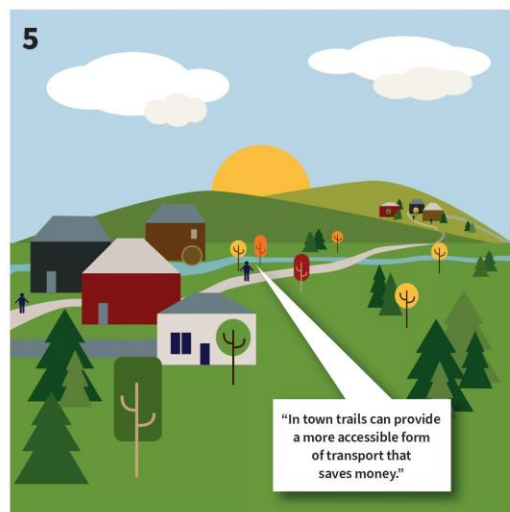
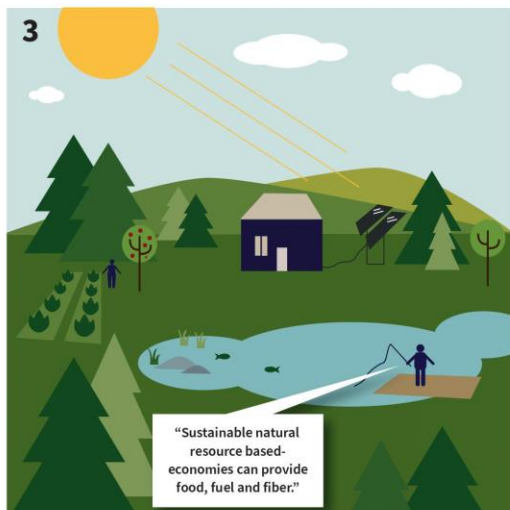
1. Youth Retention

Access to nature and the opportunity to get outdoors can help high school students and others consider their post graduate decisions and support New Hampshire's workforce needs.



2. Adaptation to a Changing Climate

Extreme heat is one of the deadliest consequences of climate change. Trees and other plants provide many benefits in a town or city setting, including shade and the reduction of what is called the "heat island effect," when more urban areas experience higher temperatures than rural locations.



3. Food, Fuel, and Fiber

Nature provides us with the building blocks of life, including crops and seafood as well as energy resources and materials for products we use every day. More economies are focusing on access to these resources in a sustainable and renewable manner.

4. Nature is an Asset for Entrepreneurs and Workforce Recruitment and Retention

Entrepreneurs and employees alike are looking for quality of life amenities when they decide where to start a business or to move for a new job. New Hampshire offers many of those amenities in close proximity to where people work, live and play.

5. Accessible Transportation

Trails, paths, riverwalks, and community right of ways can provide connectivity and the chance to safely travel from one area to another without a car. This opens up more opportunities for those with lower incomes as well as those with preferences for lower or non-polluting and more active options for travel.





6. Outdoor Recreation Increases Spending in Communities

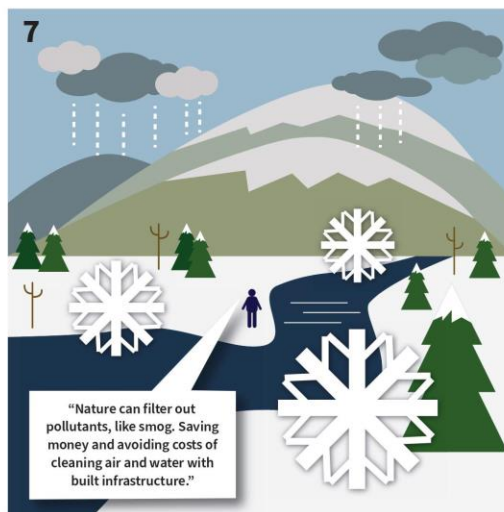
In New Hampshire and across the country, the outdoor recreation economy is becoming a significant sector of economic activity. Properly stewarded natural assets can bring new visitors, spending, and opportunities for sustainable investment around year-round outdoor activities such as hiking, biking, fishing, swimming, boating and paddle sports, hunting, off-road vehicles, horseback riding, bird watching, skiing and nature viewing, to a name a few our State offers.

7. Pollution and Flood Reduction

Nature can have the amazing property of cleaning pollution and reducing flood risk. Trees and wetlands can filter water and air as well as store carbon dioxide. Buffers and landscapes allowed to provide "green infrastructure" can also store excess water during heavy precipitation events.

8. Exercise and Connection in Nature

Local access to nature, where people live and work, allows more opportunity to exercise and connect for both physical and mental health benefits.



There are many other ways that nature supports community well-being and economic vibrancy, including the connection to indigenous knowledge and history as well as many other cultural, aesthetic, and spiritual benefits. We would love to know what you are doing in your community.

References

[Downtowns and Trails Info Brief](#)

[Rivers and Economic Development Research Brief](#)

[The Nature Economy Collaborative](#)

[Craft Breweries and Community](#)

The Nature Fix: Why Nature Makes Happier, Healthier, and More Creative by Florence Williams

Nature's Fortune: How Business and Society Thrive by Investing in Nature by Mark Tercek and Jonathan Adams

[NH's Workforce: The Youth Retention Initiative](#)

Learn More

[Nature Economy - Downtowns and Trails](#)

[10 Minute Walk](#)

[Natural Capital Project](#)

[Collaborative Research Excellence - CoRE Initiative](#)

About the Authors

Shannon Rogers, Ph.D., serves as the State Specialist of Nature Based Economic Development on the Community and Economic Development Team.

Dr. Rogers is also an Associate Extension Professor in the Natural Resources & Environment Department at UNH. She is on the Board of Granite Outdoor Alliance. Along with Drs. Cat Ashcraft and Jayson Seaman, she is leading the Nature Economy Collaborative. Members of the Collaborative are working on ideas related to this info brief and include Molly Donovan, Scott Crowder, Alex Drew, Tyler Ray and Drs. Charlie French, Scott Lemos, Rob Roberston and Mike Ferguson.

The Nature Economy Collaborative is supported by the UNH Collaborative Research Excellence Initiative.

Cody Crytzer is a graduate student in UNH's natural resources and the environment program and a Dalrymple Fellow with UNH Extension for the 2022 summer.

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Appendix C: Access to Nature and Economy in Rochester, NH Story Map

Access to Nature and Economy in Rochester, NH

<https://storymaps.arcgis.com/stories/9d7dc7cf7b0e4d349d082ac90b832...>



Access to Nature and Economy in Rochester, NH

A walking tour overview providing photos and short descriptions of each planned tour stop.

September 20, 2022



Map of Walking Tour

First Tour Stop: Downtown Rochester



Outdoor seating at downtown restaurant located close to Cocheco river.



Adopt-a-spot location close to downtown showcasing beautiful flowers and welcoming appearance.



Walking path connecting Cocheco River to downtown Rochester. Construction fo a building is currently ongoing near the entrance of the path.



Currently empty building with development opportunities.

Second Tour Stop: Riverwalk path



Shaded walking path along river with bistro style seating. Bigfoot can be seen lurking in the background.



Chairs and table along Cocheco River providing a perfect place to enjoy the natural beauty or have lunch.



Arched bridge located downtown



Governor's Inn & Restaurant on walk to Studley Flower Gardens

Third Tour Stop: Studley Flower Gardens



Entrance to Studley Flower Gardens



Koi pond with flowers in front of greenhouses.



Coheco River abutting the back end of the business.



Business located near Studley Flower Gardens.

Final Tour Stop: Hanson Pines Park



Walking path entrance to rail trail.



Entrance to Dominicus Hanson Pines with information guide and map of park.



Side entrance to Dominicus Hanson Pines Park.



View of Cocheco River from below the walking bridge.



Park and playground across from Hanson Pines Park.



Rail Trail located next to Hanson Pines Park.

Additional Links:

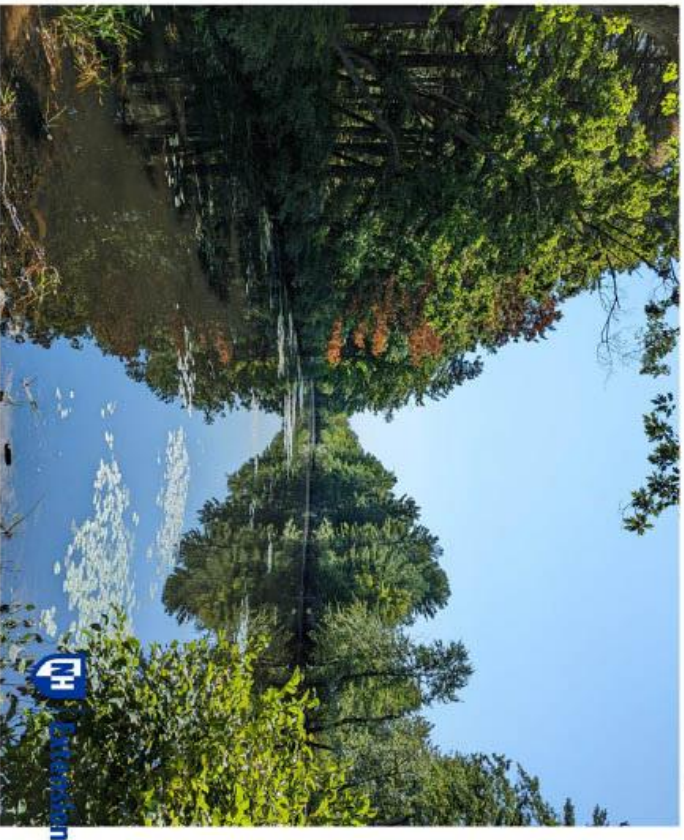
[Rochester Historic District Commission Virtual Historic Map](#)

| | |
|-------------------|--|
| All photos | Cody Crytzer and Shanon Rogers |
| Content | Cody Crytzer, Shannon Rogers, and Catherine Ashcraft |

Appendix D: PDF of Webinar Presentation Slides

Access to Nature

- **Critical component of economic, social, and ecological resilience for a community** (Rogers & Garlick, 2021).
- **Human health and general well being attributed to access of nature** (Bratman et al., 2015; McCormick, 2017; Ward Thompson & Aspinall, 2011; Winter et al., 2019).
- **Clear relationships between nature access and wellbeing.**

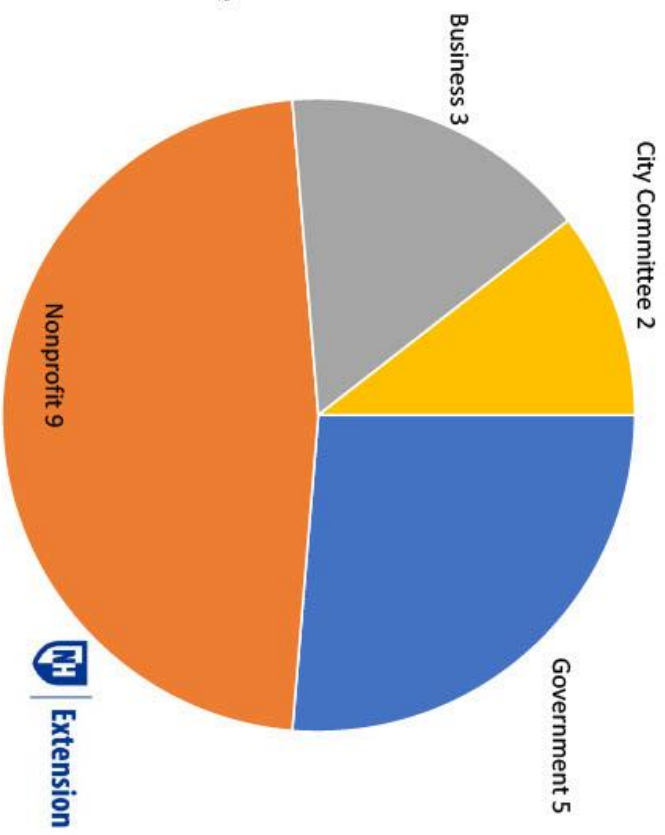


Exploring Access Through Interviews

We conducted 19 interviews with people involved in nature economy, economic development, recreation, and community development sectors.

Part of our research also focused on Rochester, NH, a community that is working on supporting access to nature for economic development and quality of life.

Our interview questions asked about how people use and value nature and how access to nature impacts economic issues.



Barriers to Accessing Nature

| Barrier Identified | Number of Times Mentioned |
|----------------------------|---------------------------|
| Transportation | 13 |
| Site Characteristics / ADA | 9 |
| Financial | 8 |
| Information | 5 |
| Time | 5 |
| Infrastructure | 2 |
| Environmental Justice | 1 |
| Sense of Belonging | 1 |

“From a transportation aspect, we live in a state that has very limited public transportation, from public bus systems to parking at trail heads. Some towns don’t even have sidewalks. So, if you don’t have a car, it becomes a lot harder to access nature”.

- Non-profit and business participant

Participant Quotes

"...we have been advocating for the aggregation of this data to a local or county level. This would be helpful in measuring impact, charting progress, and it also helps with advocacy. This would help to show state legislatures the impact their constituents are experiencing".

- Non-profit participant

"...we commissioned an economic impact study four years ago. Three of our ski glades contributed over \$1 million to the economy and 16 full time jobs over the course of just one season".

-Non-profit participant

"We're a driver or a catalyst of the local economy, but it is mutually beneficial. Some people are coming to Rochester specifically for [Business], not always for any other reason... We make sure to direct people to local resources and stores".

-Business participant

"People choose to live here and visit here because of the assets we have, but we need the resources to support that infrastructure and contribute to economy. It's difficult to maintain natural assets in New Hampshire due to lack of funding."

-Government participant

Next Steps for Communities

- Work to make information easier to locate online regarding accessibility.
- Initiate discussions on how to reduce and remove barriers to accessing nature.
- Form connections to nature where people are.
- Better connect access to nature and economic development.

Appendix E: IRB Approval Letter

Date: 2-13-2023

IRB #: IRB-FY2022-303

Title: Nature Economy Collaborative-Bridging the Gaps and Growing the Future

Creation Date: 3-4-2022

End Date:

Status: **Approved**

Principal Investigator: Molly Donovan

Review Board: UNH IRB

Sponsor:

Study History

| | | | | | |
|-----------------|---------|-------------|--------|----------|---------------|
| Submission Type | Initial | Review Type | Exempt | Decision | Exempt |
|-----------------|---------|-------------|--------|----------|---------------|

Key Study Contacts

| | | | | | |
|---------------|--------------------|-------------|---------------------------|----------------|----------------------------|
| Member | Catherine Ashcraft | Role | Co-Principal Investigator | Contact | Catherine.Ashcraft@unh.edu |
| Member | Shannon Rogers | Role | Co-Principal Investigator | Contact | Shannon.Rogers@unh.edu |
| Member | Cody Crytzer | Role | Co-Principal Investigator | Contact | cgc1020@wildcats.unh.edu |
| Member | Molly Donovan | Role | Principal Investigator | Contact | Molly.Donovan@unh.edu |
| Member | Molly Donovan | Role | Primary Contact | Contact | Molly.Donovan@unh.edu |

Appendix F: Interview Protocol

Nature Economy Collaborative-Bridging the Gaps and Growing the Future

Key Informant Interviews: Reporting Form 2022

IRB #: IRB-FY2022-303

Date: _____ Interviewer: _____

Interviewee first name: _____ Last name: _____

Affiliation/Organization: _____

Staff or volunteer? _____

Verbal Consent Y/N

Recording Consent Y/N

Verbal Introduction:

We are conducting key informant interviews focusing on better understanding how people use and value nature, which is one of New Hampshire's greatest advantages for workforce attraction, youth retention, recreation, climate resilience, tourism, and broader economic development. This work is being done by a team of faculty and staff from The University of New Hampshire and UNH Extension. Thank you in advance for your time and insights into this topic.

Key Informant Interview Questions:

1. Please describe your position in your organization and how your work relates to New Hampshire's economy as it relates to the use and value of nature (trails, parks, rivers, etc.).
2. When you consider NH's natural assets – what comes to mind?
3. From your perspective, do you think everyone has access to nature?

- If not, what are the barriers preventing access and for whom? Can you share any examples of what you mean?

4. Have you or your organization identified opportunities to expand access to nature with the goal of improving economic vibrancy in the community / New Hampshire? Can you tell me about your efforts?

- Follow up depending on response to question 3: Are there ways in which your organization's efforts aim to expand nature access for the groups who have limited access? Can you share an example?
- How is your organization engaging with or partnering with groups who have limited access? Can you share an example?

5. Is your organization involved in any efforts to expand access to nature focused on economic recovery from the COVID pandemic?

6. What kinds of challenges does your organization face in trying to expand access? Examples?

7. How do you view the impact of your work on the economy?

8. Do you track how your work involving NH natural resources impacts the local, regional, or state economy? If so, tell me about that. Do you collect demographic data? (e.g., Age, race, gender, income, education level)

Appendix G: CoRE Final Report

Project type [IWG/PRP/Prop Dev/New Ctr]: IWG

Project Title: Nature Economy Collaborative

Project Lead: Shannon Rogers (PI) Catherine Ashcraft (Co-PI), Jayson Seaman (Co-PI)

Approx. project start and end dates: 9/2021-1/2023

Report compiled by: Shannon Rogers, Cody Crytzer, Catherine Ashcraft

CoRE Project Team Members

UNH

| Name | Title | Dept. | College | Role |
|--------------------|--|--|-----------------------|------------|
| Catherine Ashcraft | Assistant Professor | Natural Resources & the Environment | COLSA | Co-PI |
| Cody Crytzer | Graduate Research Assistant | Natural Resources & the Environment | COLSA | IWG GA |
| Molly Donovan | State Specialist | Community & Economic Development | Cooperative Extension | IWG Member |
| Michael Ferguson | Assistant Professor | Recreation Management & Policy | CHHS | IWG Member |
| Charlie French | Team Leader | Community & Economic Development | Cooperative Extension | IWG Member |
| Scott Lemos Jr. | Lecturer | Business & Economics | Paul College | IWG Member |
| Robert Robertson | Associate Professor | Natural Resources & the Environment | COLSA | IWG Member |
| Shannon Rogers | Associate Extension Professor | Natural Resources & the Environment/Community & Economic Development | COLSA/Extension | PI |
| Jayson Seaman | Associate Professor and Department Chair | Recreation Management & Policy | CHHS | Co-PI |

Non-UNH (if applicable; expand table as needed)

| Name | Title | Institution/Company | Role |
|----------------------|---|---|-----------------------------------|
| Scott Crowder | Former Director of Outdoor Recreation Industry Development | NH Business and Economic Affairs | State Partner/Collaborator |
| Alex Drew | Former Granite Advocate | Granite Outdoor Alliance | Collaborator |
| Tyler Ray | Rockhound Chief | Granite Outdoor Alliance | Collaborator |

A. Project summary:

The Nature Economy Collaborative is an interdisciplinary working group, led by the University of New Hampshire, that aims to foster dialogue with stakeholders and conduct research to document changes to New Hampshire's economy as it relates to the use and value of nature. We are focusing on four themes: education, training and workforce development, community development and quality of life, natural asset use and climate resilience. Our work thus far has found that NH has a diversity of natural capital and interest in quantifying its value is high across sectors. Data specific to New Hampshire does exist, but it is limited in scope and by inconsistent collection. Many are working at the intersection of nature and economy but do not identify the connection. Funding opportunities and models for collaboration exist but they take persistent review and creative exploration. Access to nature is a topic of high importance and we oriented much of our community teaching and outreach toward exploring examples of how to improve access to nature to support local communities and economies. In Fall 2022 we hosted an interactive workshop in Rochester, NH, for 25 volunteers, students and professionals and, in January 2023, we hosted a webinar for over 50 people.

B. Status of project objectives:

In 2021, New Hampshire's recreation economy alone accounted for 2.7% of total GDP (BEA.gov). Recreation is just one part of our economy that benefits from nature. During the pandemic we saw many more people engaging with the outdoors in ways and at frequencies not seen before. Building upon previous CoRE efforts and in order to serve as a resource for many partners, we had several main objectives to help understand New Hampshire's nature economy better. They included:

1. What research and data are available at UNH to develop a baseline of nature economy changes?
2. How can UNH play a role in the development of this newly focused segment of the economy?
3. How are diversity, equity, and inclusion integrated in this segment of the economy?
4. What other examples of coordinated, state-wide, University led efforts exist that could provide models? and
5. What funding opportunities exist or are emerging in the public and private sectors?

We made substantial progress on most of the objectives as detailed below:

1. We worked with the UNH Sustainability Institute to collect existing information on faculty members and staff engaged in sustainability related research and initiatives. However, we ended up focusing on the other objectives in more detail given the interest of the working group and the perceived needs by our partners.
2. Throughout the IWG process we received qualitative feedback from state and local partners that UNH, with its ability to maintain ongoing, long-term efforts and research, was very important and appreciated in this emerging field. For example, a major state partner of ours left his position and his replacement was not hired for 6 months. During this time, stakeholders and other partners looked to UNH and our IWG to fill in some of the needs created.
3. Our research and collaboration identified access to nature as a topic of high need. We found not only were there needs for data around economic impacts and benefits but partners sought to see tangible examples and case studies how communities could improve access to nature with an eye to economic and community improvements. This led to many of the questions in our interview protocol and our case study work in Rochester, NH in partnership with their directors of economic development and recreation.

Significant outcomes/impacts (e.g., research, education, society) that have resulted from this project:

- **26** *Funding opportunities* tabulated
- **20** New Hampshire specific *reports* and *studies* reviewed
- **19** Stakeholders interviewed
- **17** *center models* reviewed
- **3** *infobriefs* published
- **1** *community workshop* and *walking tour* (Rochester) with **1** *story map* published
- **1** *project website* established and updated
- **1** NH real estate *data set* obtained
- **1** Embrace NH UNH Presidential Bus Tour stop on Nature Economy at our case study community of Rochester, NH
- **25** students, volunteers, and professionals trained on access to nature through an interactive panel and walking tour in Rochester, NH—a community that is working to integrate nature into economic and community well-being goals
- **90** registered and **52** people attended our webinar on Access to Nature and Its Community Economic Implications. The webinar was made publicly available through the UNH Scholars Repository.
- Presentations or modules in **4** UNH courses to a total of **156** students
- Collaborative intersection with the CoRE-funded *Youth Retention Initiative* yielded a successful NSF *Advancing Informal Science Learning* proposal and an additional Embrace NH Bus Tour stop led by Drs. Seaman and Ferguson focused on outdoor resource management and workforce development/career pipelines.

What were the most significant challenges faced during this project? If these challenges impacted the results or outcomes you anticipated or moved the project in new directions, please describe that experience.

Describe any non-CoRE personnel, financial, or in-kind contributions that supported this work.

Rochester's staff and the interview participants' time. Program manager and administrative assistant in Cooperative Extension.

C. Lessons Learned:

- What worked and what did not work in regard to collaboration/team dynamics, productivity, communication, and specific activities/research that were conducted?
 - Breaking into workings groups worked well and having 1 person (MS student) participating in all of them provided continuity and awareness of what the different working groups were each doing
 - Shared documents worked well
 - Regular meetings with working group work in between worked well
 - Partnership with Rochester was a highlight!
- What would you do differently next time?
- What advice would you offer to either the CoRE management team or future awardees to increase the likelihood of a productive experience?

D. Impact and Next Steps

- Please describe the impact of CoRE funding and support with respect to activities, collaborations, outcomes, next steps, etc. that could not necessarily have taken place otherwise in this timeframe.
 - Collaborative CoRE activities laid the groundwork for a successful proposal to launch a joint tenure-track position split between Recreation Management and Policy (75%) and Cooperative Extension (25%) to foster additional engaged scholarship in community and economic development focused on the nature economy.
- Funding for MS student made it possible for 1 person to participate across the working groups and provided continuity across project elements. Was impetus for us to meet regularly and keep advancing ideas
- What are your plans to sustain or expand this project post-CoRE funding? Please describe next steps, future collaboration opportunities, and expected deliverables that leverage this CoRE project, planned, or anticipated over the next 2 years.
 - Cat: I have a much better appreciation of how the nature economy fits into my research interests and plan to build on collaborations in how design future projects. Dr. Shannon Rogers and Jayson Seaman are planning on submitting two proposals to our legislative liaison team for earmark projects focused on: Supporting further development of outdoor recreation facilities in Keene, NH including physical infrastructure and a local workforce pathway program. Developing an outdoor economy incubator in collaboration with Granite Outdoor Alliance, the NH BEA's

Outdoor Recreation Industry Development office, and the UNH Small Business Development Center

- Drs. Rogers and Seaman are also working with the legislative liaison team to explore future funding through a new MOU between the USDA, NIFA, and USFS designed to promote rural recreation development.

E. CoRE Support and Services (Please be candid in your responses. Your input will inform improvements to the CoRE initiative.)

- Please assess the value of the following CoRE support mechanisms as they relate to the success of your project objectives (1=poor, 2=average, 3=good, 4=excellent, 5=was not aware of support):

| | | |
|--|-----|--------------------|
| CoRE website (overall) | [3] | |
| CoRE website – calendar | [3] | |
| CoRE website – resources | [3] | |
| CoRE communications from staff | [4] | |
| Check-ins | [4] | |
| Informal guidance from CoRE staff | [4] | Maria is fabulous! |
| CoRE kick-off event (October 2022) | [2] | |
| Other (please explain): | | |
| The online format is always a bit tricky for collaboration, but it was nice to see the variety of projects supported | | |

- Please assess the value of the following CoRE support mechanisms as they relate to your interest and ability to pursue collaborative research (1=poor, 2=average, 3=good, 4=excellent, 5=was not aware of support):

| | |
|------------------------------------|-----|
| CoRE website (overall) | [3] |
| CoRE website – calendar | [3] |
| CoRE website – resources | [3] |
| CoRE communications from staff | [4] |
| Monthly Check-ins | [4] |
| Informal guidance from CoRE staff | [4] |
| CoRE kick-off event (October 2022) | [3] |
| Other (please explain): | |

- What additional services or support could CoRE have provided to improve the success of your project?

We were fortunate that Maria and Lynnette were able to make connections to UNH Foundation colleagues so we could discuss all types of funding opportunities.

F. Outputs (no page limit)

Please list below any outputs that directly relate to your CoRE project or CoRE activities (e.g., kick-off event). Expand tables as needed. If none, please mark N/A in the appropriate categories.

1. Research Proposals and Awards

| Date submitted or awarded | Project Title | Prime Sponsor | \$ proposed or awarded | Status: pending, awarded, declined | PI and Co-PIs |
|---------------------------|---|--|------------------------|------------------------------------|---------------|
| 12/2022 | NH Outdoor Recreation Inventory/Nature Economy Collaborative. | SE Group via NH Outdoor Recreation Industry Development Office | \$7,000 | awarded | Rogers |

2. Teaching and Instruction

Courses taught (for degree credit or non-credit) based on CoRE project or relationships

| Course #, title | Level (undergrad, grad, etc.) | Description of class | Dates offered |
|--|-------------------------------|---|------------------------|
| EREC 627, Community Economics | undergrad | Local economic development approaches and case studies, community capitals-integrated findings and new module into this existing course | Fall 2022 |
| NR 995.06, Access to Nature and Community Economics | graduate | Independent study Cody completed with Dr. Rogers to explore the connections between accessing nature and the fundamentals of community economics. Developed a module that was presented and taught in EREC 627 | Fall 2022 |
| EREC 572, Introduction to Natural Resource Economics | undergrad | Overview of approaches to monetizing natural resource management and evaluating tradeoffs among different policy approaches to activities such as agriculture, forestry, marine resources, etc. I am adding additional topics of data related to natural resource valuation locally and regionally because of our findings in the CoRE work | Spring 2023 |
| NR 602 Natural Resources and | undergrad | Expanded module on land conservation/multiple use values by incorporating a guest lecture | Spring 2022, Fall 2022 |

| | | | |
|--|----------------|--|-------------|
| Environmental Policy | | and case study information on the nature economy | |
| NR 724/824 Resolving Environmental Conflicts | undergrad/grad | Developed new course content on public participation/engagement by incorporating a guest lecture and drawing on the nature economy work to illustrate key concepts | Spring 2022 |

3. Public/Professional Service, Outreach and Community Engagement

Could include workshops, seminars, presentations, etc. based on CoRE project or relationships

| Date | Personnel involved | Description of activity | Audience (e.g., K-12 teachers) | Est. # of participants |
|------|--------------------|-------------------------|--------------------------------|------------------------|
| | | Walking tour & Bus tour | | |
| | | Webinar | | |

4. Publications

b.) Non-refereed publications

| Authors | Year | Title | Journal | Status: submitted, accepted | DOI (if available) |
|---------|------|-------------|--------------------------|-----------------------------|--------------------|
| | | Info briefs | UNH Scholars Repository? | Published | |
| | | Story map | Website? | Published | |
| | | Webinar | UNH Scholars Repository? | | |

5. Technical Outputs

Please list any technical outputs such as software programs, databases, algorithms, measurement instruments, protocols, curricula, etc., below

| Date | Personnel | Description |
|------|-----------|--|
| | | Tables of grants, UNH faculty expertise... |

6. Intellectual Property and Commercialization and Technology Transfer

Please list any innovation disclosures submitted to UNHInnovation and/or commercialization activities that are related to your CoRE project.

| Date | Personnel | Description |
|------|-----------|-------------|
| | | |
| | | |

7. Awards and Honors

Awards and honors conferred to faculty, staff, and students as a result of their CoRE activities.

| Date | Awardee | Description |
|------|--------------------|---|
| 2022 | Catherine Ashcraft | UNH Sustainability Award for Faculty Research |
| 2022 | Shannon Rogers | UNH Sustainability Award for Faculty Engagement |

G. Other. Please describe any activities, products, accomplishments, or obstacles not addressed in other sections of this report that you feel are important for us to know.

We conducted evaluations after our workshop and webinar and wanted to share a brief summary of the findings.

Workshop: We received 10 responses and 100% agreed that they saw tangible examples of how nature connects with a community's economy. 100% also agreed that they can identify some of the barriers to connecting nature and economy. 70% made a new contact and learned of a new resource. 90% said they now have an example of connecting nature and economy that might work in their own community or organization.

Some illustrative quotes follow:

"I was thrilled to be involved in the workshop and very glad it took place within the community. Many advancements are occurring in the development of Rochester, and I look to the strength of the existing committees to preserve the environment as the advancements develop and grow."

"The most important take aways from today's panel discussion and walking tour are the number of proponents at the local level for an increase in recreational improvements and the disconnect between local needs and state policies for funding such projects. Nevertheless, there appears to be ample opportunities to improve local and regional network connectivity."

Webinar: We received 20 responses to our webinar evaluation and found high levels of satisfaction and learning among respondents. Over 90% of respondents said they saw tangible examples of how nature connects with a community's economy and could identify some of the barriers to connecting nature and economy. Over 50% said they plan to participate in future trainings as a result of this webinar. Some illustrative quotes:

"[One of the most important takeaways was] that there are people studying this which makes it easier to convince our city management that it is not a waste to preserve nature."

"Importance of accessibility and transportation to outdoor recreation resources."

"Excellent & timely"

"These workshops are a great way to keep UNH Alumni involved with current research and build social capital opportunities between our current fields/places of work and the Extension."

H. Please share any additional comments or observations about the CoRE program that may help to strengthen the program and its institutional value.

This has been an amazing opportunity to bring together colleagues who often want to work together but can't find the time or structure. The CoRE program and support allowed us the space and resources (via a graduate assistant) to connect, share, brainstorm and innovate. It has been a wonderful seed to grow future collaborations and larger initiatives.