

ABSTRACT

Title of Thesis: DEFINING DISABILITY-CENTERED
DESIGN THROUGH PRACTICE:
CENTERING NEURODIVERSITY IN A
CONSERVATION PARK DESIGN

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INTRODUCTION This research aims first to define Disability-Centered Design (DCD) as an existing methodological research and design phenomenon, then to explore the practicality of using DCD for public natural parks. DCD differs from similar approaches by emphasizing disabled designers as expert researchers/creators in generating design guidelines that address the bodily, psychological, and cognitive desires and needs of disabled users. DCD typically focuses on designing for specific disability communities with implications for designing in the public sphere. As a case study, DCD was used for a collaborative schematic design that centers neurodivergent spatial experiences for the currently undeveloped Lower Serpentine Barrens Conservation Park (LSBCP) in Potomac, Maryland.

LITERATURE REVIEW Different models of disability are discussed in relation to historic and current strategies of disability design, with preference for the social model of disability for its impact on the development of Universal Design and other human-centric approaches. Existing

examples of disability design approaches are explored in terms of their applicability/inapplicability to the DCD definition. Particular attention is given to examples that center neurodivergent spatial experiences, including Finnigan's (2024) Sensory-Responsive Environments and Jensen's (2023) hypo- and hypersensitivity mapping.

Neurodivergence/neurodiversity is defined and existing knowledge about the relationship between neurodiversity (specifically autism spectrum disorder, attention-deficit/hyperactivity disorder and dyslexia) and spatial experiences (specifically sensory processing, navigation/wayfinding, and information processing) explored. The existing knowledge on the benefits of inclusion in public spaces and access to natural settings for neurodivergent individuals, as well as barriers to accessing these spaces, is also discussed.

METHODS DCD methods include site inventory and analysis of geologic, hydrologic, ecological, and cultural/historical aspects of the LSBCP using a mixture of GIS mapping, historic aerial photographs, secondary historical sources, technical reports and use plan reports for the combined lower and upper sections of the Serpentine Barrens Conservation Park, and personal observations of the site; expert Interviews of disabled and non-disabled disability-focused landscape architects, designers, and design policy makers; hypo-/hypersensitivity mapping using Benjamin Jensen's (2023) methodology; a participatory sensory audit; and a participatory design workshop. The sensory audit engaged thirteen adult participants, all neurodivergent or parents to neurodivergent children, to tour a conservation park with extant design elements to assess the effectiveness and sensory experiences of particular design and environmental typologies that also exist or will exist within the LSBCP. Participants engaged through verbal, written, photovoice, and good/bad indicator card responses. The same participants then reflected on these explorations of space and design during the design workshop,

in which they engaged in a number of interactive activities to generate design ideas for the LSBCP.

EXPECTED RESULTS AND DISCUSSION A final schematic design for Lower Serpentine Barrens Conservation Park is generated unifying the design elements and preferences expressed by participants. The effectiveness of the DCD methods and how they inform the design outcome is discussed.

DEFINING DISABILITY-CENTERED DESIGN THROUGH PRACTICE;
CENTERING NEURODIVERSITY IN A CONSERVATION PARK DESIGN

by

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Preface

Aimi Hamraie describes in their 2017 book, *Building Access: Universal Design and the Politics of Disability*, how in the 1920s, the U.S. military hired statistician Charles Davenport to measure soldiers' bodies. The military wanted a database of anthropometric information that could be used to organize body shapes into population averages, norms, and standard deviations, and ranges of difference from the norm, for use in standardizing all aspects of equipment, weaponry, and transportation (p. 48). Later, human engineers Henry Dreyfuss and Alvin Tilley drew directly from Davenport's data to generate "Average Joe," a rigid, standing, white-fill-with-black-outline diagram of a masculine figure representing the statistical average of human bodies (at least, according to the data) (p. 31), which Hamraie calls the "normate template" (p.19). Average Joe was a tool created for industrial designers as a way of extrapolating how bodies, "stand, sit, crawl, work, breathe, feel" (p. 34), and shaped the methodology of user-centered design (p. 37). In the 1980s, legal requirements for accessible architecture necessitated an update to *Architectural Graphic Standards*. Although Universal Design pioneer Ronald Mace had developed illustrated depictions of the codes, *Graphic Standards* adopted the featureless white Average Joe for its diagrams, including Joe in a wheelchair and Joe using crutches (p. 38).

Charles Davenport was a eugenicist, and his views on "defective" populations had an indelible impact on the data he produced (Hamraie, 2017, p. 48). The featureless white figures that in present day define the methods of designing access trace back to a quantification of human form that – worse than marginalizing disabled bodies – never

included them at all. I describe this history not as a criticism against accessibility standards, but to illustrate that the ways design fields know and describe disability are entangled in a legacy of valuing certain humans over others.

It took realizing in my late twenties that I was neurodivergent to engage with disability theory fully. As I worked to reconcile this new understanding of myself against the internalized expectations of productivity, attention, and normalcy, I found clarity and comfort by listening to the words of leading disability advocates. As I became more connected with the disability community, learning from disabled artists, makers, and advocates, I realized that alongside discovering new perspectives, I also had to do the difficult work of unraveling my own biases. Critical disability theory provided me with a framework for how to start this process, helping me recognize how ableism had shaped my thinking and how these biases had defined my understanding of space and design. It also introduced me to disabled ways of understanding the relationship between physical space and bodies – insights that are largely missing from mainstream landscape design discourse.

This shift in perspective sparked my growing interest in exploring disability not just as a condition, but as a source of design creativity and innovation. I began to see the potential for disability – including my disability – to shape more inclusive and imaginative approaches to space-making, especially in the context of natural landscapes. The more I delved into this, the clearer it became that disability could offer innovative and valuable insights into how we interact with and shape the world around us.

When I started my graduate studies in landscape architecture at the University of Maryland, I already knew I wanted to use my thesis project to challenge the field's

conventional approach to disability. I was determined to explore how the discipline could engage with disability in more meaningful, inclusive ways, rethinking how we design spaces that welcome, empower, and respond to a variety of bodies and experiences.

This project is the result.

Dedication

To my dad,
who never ceased to inspire, support, listen, and love
through his own journey of disability and illness.
I miss you.

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I want to give a very warm thank you to Guy Semmes, my Travilah community oral historian. You not only lent your time to what became quite a long (but very enjoyable) conversation. You also shared so many childhood memories of the old

Travilah community, the Tiptons and their pond, and the beautiful forests around your childhood home that had me laughing and sighing in turn. You are a wonderful storyteller. I hope I have managed to honor your warm memories.

And of course, thank you to Paul Tukey for connecting me with Guy in the first place.

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Without the support from Cathy Robertson of DCPeers and David Greenburg of the League for People with Disabilities, I would not have been able to conduct this research with such a creative, insightful, and fun group of participants. Thank you both for seeing something worth supporting when I rambled on to you about this project so many months ago.

So much of this project rested on the amazing conversations I had with the design experts, including Amy Wagenfeld, Alexa Vaughn, Jum Elliott, Katheryn Finnigan, Benjamin Jensen, Maci Nelson, and Juliet Shoultz. Thank you all so much for your thoughtful—and at times delightfully challenging—conversations.

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Chapter 1: Introduction

We are in a historic moment for disability activism. Unprecedented levels of global social connection, facilitated through media sharing apps such as Instagram and TikTok, have revolutionized the networking and advocacy potential for the disability community. The leading voices of disability are more diverse and intersectional than ever before (Thompson, 2019). Advocates such as Imani Barbarin (2025) and Molly Burke (2022) engage with hundreds of thousands of social media followers on individual posts. Disability activism is increasingly expressed through art and design (adaptation + ability group, n.d.), and more and more disabled authors are publishing work in every genre (Winchester, 2023). It all adds up to a growing and public declaration of pride in being disabled.

Within the disability community, this pride is flowing cross-generationally, connecting emerging young leaders with the pioneers of the disability justice movement. As disability author Ben Mattlin (2022) wrote,

This broader, more diverse, and inclusive sense of who and what comprises the disability community does not blur boundaries. Rather, it only makes us a deeper, richer, fuller, and frankly all the more compelling culture. [...] [T]he more I know about my disabled peers and ancestors, the better I feel about being a member of the club (para. 17).

Disabled critical theorists such as Aimi Hamraie, author of *Building Access: Universal Design and the Politics of Disability* (2017), and David Gissen, author of *The Architecture of Disability; Buildings, Cities, and Landscapes beyond Access*

(2023), are changing the way we understand the built environment and embodiment of space. These theorists are looking beyond issues of mere access and into the more nuanced and complex issues of experience. As Gissen said:

Typically, contemporary disability critique of cities focuses on promoting more access for disabled people to circulate through urban spaces, such as sidewalks, streets, and public spaces. All of that, of course, is extremely important. However, in my chapter ‘The Urbanization of Disability,’ I ask whether a disability critique of the modern city should aim simply to access the city as it is—or should it rethink some of the values embedded in urban spaces? (Okuya, 2023, para. 8).

For landscape architects, we can apply this question beyond the bounds of urban design and into green landscapes. Is it enough to give access to natural landscapes?

In this Master of Landscape Architecture thesis project, I posit that not only is there more to inclusive design than access, but that a new cohort of disabled landscape architects is modeling ways of embodying the whole experience into landscape design, using what I call disability-centered design (DCD). This project has three goals: The first goal is to *define DCD as an emerging inclusive design strategy based on self-determination*. The second goal is to *test how and to what extent DCD works as a strategy for designing public landscapes*; I test the strategy by developing a public conservation park design that centers neurodivergent ways of knowing and experiencing space. I use the Lower Serpentine Barrens Conservation Park in Montgomery County as my site, a “clean slate” site with intriguing geological and

biological attributes. My final goal is to *model and test a methodology for neurodivergent participatory design that includes a way of assessing the sensory and emotional experiences of a site and a multimodal participatory arts workshop.*

In this chapter, I explore frameworks for understanding disability, existing strategies for inclusive design, and why disability-centered design (DCD) stands out as something unique. I also explore existing knowledge about designing for neurodiversity and the challenges and opportunities inherent to designing for disabled experiences in public parks.

In the next chapter, I describe my process for defining DCD and development of a framework of understanding DCD as a design approach. I then describe my process for choosing the Lower Serpentine Barrens Conservation Park and explore an inventory and analysis of the history, context, and conditions of the site. Finally, I describe my methodology for participatory design research and explore the themes and results from that research.

In the Results chapter, I describe my final proposed design for the Lower Serpentine Barrens Conservation Park that centers neurodivergent experiences. I explore how the themes and information from the participatory design research and the site analysis directed the overall design as well as the design of specific features and the use of materials.

In the final Discussion chapter, I reflect on the overall success of the study. I assess the effectiveness of the participatory design research methodology for generating neuro-affirming landscape designs. Lastly, I analyze how well the

methodology and final design align with my definition of DCD, and how a DCD approach did and did not work for a public park site.

This project has significant personal importance for me, yet the topics it addresses also hold profound relevance in a broader, societal context. As Hamraie said, “The stakes of a more critical understanding of accessibility and universal design are quite high because of the reach of these concepts into so many fields and also into so many geographic areas” (Othering & Belonging Institute, 2019, para. 23).

A few notes on language:

Firstly, many of the inclusive design strategies I discuss in the next chapter and beyond have different names outside of the U.S., or the names that I use have different meanings or contexts. I will only use the generally accepted names and meanings typical to the United States.

Secondly, although most medical and institutional settings prefer person-first language (i.e., a person with disabilities), I will be using identity-first language (i.e., *a disabled person*), as this language is generally preferred by the majority of the disability and neurodiversity communities (Baumer & Frueh, 2021). Readers should note that individuals may prefer other language uses, however. Additionally, I will use capitalization for all instances of “Autism” or “Autistic.” While not universally adopted, this capitalization is used by many Autistic individuals (Forbes, 2020) and some peer advocacy groups (Pittsburgh Center for Autistic Advocacy, 2017) to emphasize that Autism is more than a diagnosis; it is also an identity, a culture, and a community. Unless I am explicitly speaking from or about the medical way of understanding Autism, I will not be using the term “Autism Spectrum Disorder

(ASD).” Similarly, I will follow the preferred conventions of “d/Deaf and Hard of Hearing” when speaking about the broader community and “deaf,” “Deaf,” or “d/Deaf” to refer to an individual depending on how they themselves identify. Although sometimes I will use “ADHD person” for grammatical clarity, I will typically use the still generally accepted “person with ADHD.” Within the ADHD community, “ADHDer,” a noun used on its own without qualifying the word “person,” has also been growing in widespread use (Holland, n.d.). This is a term I use to describe myself, and have used it sparingly in this project.

Lastly, a few definitions: “Neurodivergent” refers explicitly to neurological and cognitive differences that are socially and medically treated as atypical. “Neurodiversity” is sometimes used with the same meaning, but more often refers to the more general range of neurological/cognitive differences. The opposite of “neurodivergent” is “neurotypical” (The Brain Charity, 2022).

“Normative” is a word that describes when something or someone comes from or embodies the dominant cultural and political expectations for what is considered normal. Rosemarie Garland-Thomson developed the word “Normate” to describe “the corporeal incarnation of culture's collective, unmarked, normative characteristics” (Garland-Thomson, 2002, p. 10). In other words, the normate is the standard used to decide who is and who is not normal.

Chapter 2: Literature Review

Landscape architects apply a unique influence on the shape and form of public life. Outdoor civic landscapes form the very foundation of American landscape architecture, going back to Frederick Law Olmsted's democratic public parks in Boston and New York City in the mid- to late-nineteenth century. The choices we make in designing these spaces have a way of defining citizenship beyond legal franchisement. When we build a park for a specific idea of "the public," we create obstacles for anyone outside of that expectation to engage in civic space. These obstacles stem from a lack of imagination on the part of designers regarding the diversity and variety of human form. Disability theorists have a way of explaining this, called the social model of disability. It describes how the infrastructural, political, and interpersonal structures that exist within a given space create disability by excluding and marginalizing some variations in body and mind (Garland-Thomson, 2012). Unlike the medical model of disability, which sees disability as a flaw inherent to the individual, the social model emphasizes society's failure to accommodate diverse needs. Bioethicist and disability justice leader Rosemarie Garland-Thomson expanded this framework to describe how when bodies and space meet, they either come together in harmony or disjunction – they either *fit* or *misfit*. As she argues, "The primary negative effect of misfitting is exclusion from the public sphere—a literal casting out—and the resulting segregation into domestic spaces or sheltered institutions. The disadvantage of disability comes partly from social oppression encoded in attitudes and practices. However, it also comes from the *built and arranged environment* [emphasis mine]" (Garland-Thomson, 2011, p. 594).

Design fields concerned with this “shape and stuff” of the world, therefore, assert considerable influence over experiences of *fit* and *misfit*. It is promising, then, that the field of landscape architecture is increasingly interested in issues of access.

Within the last five years, landscape architects have started to take a more intentional approach to designing inclusive landscapes. In 2020, the American Society of Landscape Architects published a guide to Universal Design (UD) (American Society of Landscape Architects [ASLA], 2020). Although newly gaining attention within the field, UD, or the art and practice of design to accommodate the widest variety and number of people throughout their life spans (Salmen, 2011), was by then a well-established approach in architecture and product design. The concept of Universal Design first emerged in the 1980s, spearheaded by disabled architect Ronald Mace, two decades after barrier-free design began to be coded into U.S. law in the 1960s. Mace developed the language of UD as “design for all” and hoped that it would create a consumer market for accessible products (Othering & Belonging Institute, 2019). His work to popularize UD had the tremendous impact of developing a design language for incorporating intentional accessibility features from the very beginning of the design process. However, the optimization of UD’s marketability and its growing popularity created an economic incentive for businesses and designers to promote “UD” products that did very little to advance disability access. UD became synonymous with mere “good design,” with design magazines downplaying its disability justice roots in favor of emphasizing its value to nondisabled people (Hamraie, 2017). The curb cut was celebrated not because of the significant impact it had on the lives of wheelchair and mobility device users, but

because it also benefited people pushing strollers, roller skaters, and people with carts. As Cathy Hannabach put it, “Of course, this implies that if a particular design practice only benefited marginalized people—for example, if it only benefited people with disabilities—it somehow wouldn’t be worthwhile, which is the problem with that argument itself” (Hannabach, 2018, para. 14).

When access is the focus, designers and builders often talk about accessibility in terms of solutions to make a space functional (Hamraie, 2022). Within design discourse, ramps and tactile warning strips are solutions to making disabled lives easier. However, as disabled architect David Gissen said, “That’s fine, however I don’t see myself as a problem to be solved” (Okuya, 2023). These accessibility “solutions” in turn become the tools with which designers categorize and understand disabled people. In other words, “In this world, people with a multiplicity of mobility differences get called “wheelchairs,” and a limited framing of physical disability tends to be the only impairment that even begins to count in design processes” (Boys, 2018, para. 13). This dynamic creates a discourse wherein disabled people’s only importance to a design is the level of threat they pose to the functionality of the space. Designers can be somewhat forgiven; the language is coded into the very documents that define what it means to make a space legally accessible: The 1968 Architectural Barriers Act (ABA) and the 1990 Americans with Disabilities Act (ADA). “The codes make no mention of what it might feel like to use these ramps; they focus on what it takes to enter a building safely,” said dancer and wheelchair user Alice Sheppard, “Though perfectly usable and necessary, I see these designs as examples of #rampfail. Disabled people want more than access” (Sheppard, 2019, para. 12).

What is missing from the language is the diversity of ways humans process, interact, and create with and within their environment because of their disability. Music theorist Joseph Straus describes one example of this with his concept of “disablist hearing,” which he defines as, “the ways that people whose bodily, psychological, or cognitive abilities are different from [how] the prevailing norm might make sense of music” (Straus, 2011, p.150). Straus’s crafting of the term “disablist” draws grammatical inspiration from the word “feminist” as a way of solving a lexical ambiguity: the word “disabled” serves as both an overarching theory of study (i.e., disability studies) and a specific term defined in opposition to “normatively abled.” In his text, Straus ties this term disablist to his primary interest in the ways the “experience of inhabiting an extraordinary body can inflect the perception and cognition of music” (p. 158). He describes how an Autistic person might experience music as patterns of associative networks, as the integrity of pitch, and as repetition. When I first read Straus’s theory of disablist hearing, my mind immediately went to Walter Hood’s explorations in developing a visual landscape design language derived from blues and jazz (1993), and Lawrence Halprin’s “motation,” a system of imagining and documenting movement that takes inspiration from ways of notating music (Arnold, 2016). What might these imaginings look like when translated through Autistic hearing? Might we discover disablist space? Jeffrey Mansfield, Director of MASS’s Deaf Space and Disability Justice Lab posed this challenge to the field when he asked, “How can we identify unique forms of sensory knowledge, amplify them, and support these various experiences to allow

communities to decide for themselves how they relate to the world?” (Allen, 2012, para. 5).

A small cohort of disabled landscape designers has begun to tap into the unique ways they perceive and understand space to shape the built environment in distinctly non-normative ways. These designers all independently embarked within the last seven years on landscape design knowledge-making that centers on the experience of their disability or neurodiversity. In 2018, Deaf landscape architect Alexa Vaughn developed DeafScape, a design framework that translates the collaborative work of the Gallaudet Deaf community and architect Hansel Baumanto, creating campus spaces that fostered better d/Deaf and Hard of Hearing *fitting* into the larger scales of landscape and urban design. As Vaughn wrote, “To the Deaf community, the landscape is a rich sensory experience; in the absence of sound, the visual, tactile, and even the olfactory senses are amplified” (Vaughn, 2018, para. 5). Vaughn has also developed the digital resource *design with disabled people now* and has spoken extensively on engaging in more inclusive design processes and creating accessible public landscapes. In 2023, Benjamin Jensen received the ASLA Student Honor award for his thesis project, *Designing Spectrums* (ASLA, 2023). Primarily an autoethnography exploration of how Autism influenced his ways of perceiving and processing sensorial landscapes, Jensen developed a methodology for mapping sensory experiences through time (Jensen, 2023). The same year, Kathryn Finnigan completed her Master of Landscape Architecture thesis research, *Sensory Responsive Environments: A Qualitative Study on Perceived Relationships between Outdoor Built Environments and Sensory Sensitivities* (2024). Through a series of qualitative

interviews, Finnigan developed a theoretical framework as a tool for designers to create landscapes that support the sensory needs and desires of neurodivergent people (Finnigan, 2023). Later that year, Finnigan and Jensen co-founded the NeuroScapes Design Collective along with Maci Nelson and Mark Simonin (NeuroScapes Design Collective, n.d.).

These examples stand out as something noticeably distinct from the UD approach of “design for all.” The field has taken notice – both Vaughn and Finnigan are former Landscape Architecture Foundation Fellows, and all three have presented at the annual American Society of Landscape Architects conference. However, to speak of this work in the general terms of “inclusive design” seems to miss a crucial element: They are more than inclusive; they are self-determinist. In some ways, these are not projects interested in universal inclusion. In all three examples, these designers explored how landscape design could match the experiences of specific disablist experiences, to design spaces of *fit* specifically for their own misfit communities.

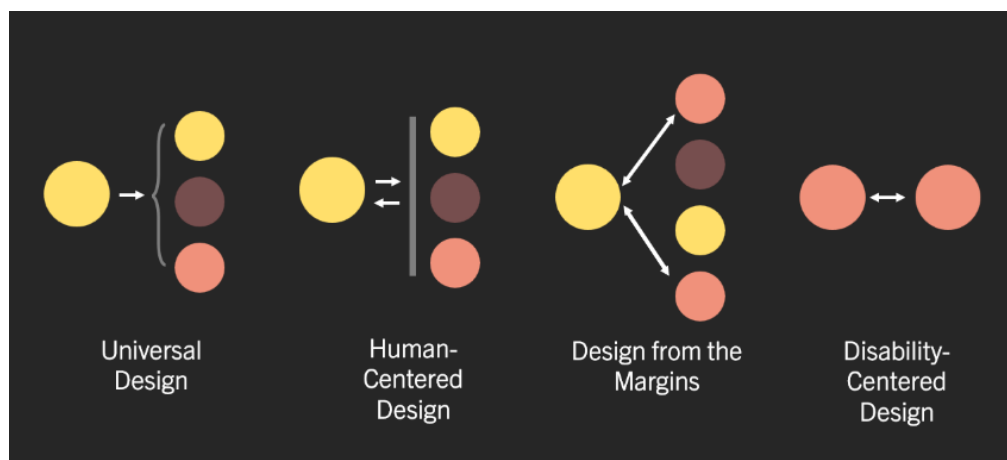
Human-centered design, a design approach first developed in engineering design that considers the entirety of the user, including psychological and emotional needs (Vinney, 2023), seemed a closer name for the approach taken by Vaughn, Jensen, and Finnigan. Human-centered design emphasizes participation throughout the design process, engaging user or community input along multiple touchpoints. However, a closer look reveals that the discourse around human-centered design assumes the stance of an abled, normative designer placing disabled people in the role of non-expert advisors. Descriptions use phrases like “cultivating deep empathy with

the people you're designing with" (IDEO, n.d.) reveal the apparent assumption that the designer and user do not have shared experiences. Human-centered design is also not an inclusive design strategy, although it may be used towards an inclusive design approach. Just like UD, Human-Centered Design is promoted as a strategy for mere good design, as can be seen with Sasaki's Xuhui Runway Park (Sasaki, 2024).

Human-Centered Design may require user participation, but it is up to the designer to define who the expected user is.

Design from the margins takes a more intentional approach to inclusion by "center[ing] the most impacted and marginalized" in the design process (Rigot, 2022, para. 1). Design from the margins assumes that design that serves those at the far margins also benefits everyone (although, as I have already argued, what happens when it does not?). The language used to describe design from the margins shares the same assumptions as human-centered design, although with more emphasis on empowering the participant communities (The De|Center, n.d.).

Figure 1.00 Comparison of Universal Design, human-centered design, design from the margins, and disability-centered design



Ultimately, I was unable to find an existing design strategy framework that adequately described the emerging pattern of landscape designers developing spaces that precisely fit their communities. Inclusive design strategies such as UD, human-centered design, and design from the margins all bore certain similarities. However, none could fully articulate the mixture of design activism and empowerment that I saw from Vaughn, Jensen, and Finnigan. I began to refer to the phenomenon these three belonged to as “disability-centered design.”

At first, I assumed the phrase disability-centered design existed and would already have a definition; I considered it a placeholder title. After much research and conversations with several design professionals, however, I realized that bafflingly enough, disability-centered design did not seem to be a phrase that existed yet – at least, not about a specific design approach. I found one workshop titled, “Building the World We Long for: Disability-Centered Design for World Language Learning,” but the description clarified that the topic was, “the ethical and practical rationale for disability-centered course design,” which seems to understand “disability-centered” as a general way of describing, and not part of a name (Language Institute, n.d.). The Mexican Institute for Tourism and Accessibility offers a certification in a “Persons with Disability-Centered Design” methodology, but as I am not familiar with the specific context of Mexican disability discourse, I did not factor that in (Instituto Mexicano de Turismo y Accesibilidad, n.d.). Since I could not find a precedent use, I chose to name this design phenomenon disability-centered design (DCD). This MLA thesis research endeavors to give disability-centered design a definition and explores opportunities and limitations within the field of landscape architecture

by modeling a DCD process. As I describe in greater detail in the next chapter, I engaged in a participatory design process with a cohort of neurodivergent community members to develop a neurodivergent-centered design solution for the Lower Serpentine Barrens Conservation Park in Montgomery County, Maryland.

Designing for Neurodivergent Ways of Experiencing Space

The term “neurodiversity” (and its antecedent “neurological diversity”) developed within online Autistic communities in the late 1990s as a way of radically reframing the standard narratives about Autism. These communities argued that all humans experience neurological variations, that these variations were natural, and that Autism described but one collection of them. These differences are not deficits, and are in fact necessary for generating new technological, cultural, and artistic ideas and advances (Botha et al, 2024). Until this moment, Autistics navigated an existence of double misfit – unable to embody expectations of the “normal person,” but simultaneously rejected as “not really disabled” by contemporary disability discourse (Mattlin, 2022). Neurodiversity language represented the coalescing of the Autistic community around a shared identity and self-advocacy effort pushing for acceptance of all neurological differences (Baumer & Frueh, 2021). Although neurodivergence was initially understood to specifically refer to Autism, in the following decades the definition expanded to include a broad range of “atypical” neurotypes, including Attention-Deficit/Hyperactivity Disorder (ADHD), dyslexia, Down syndrome, mental health conditions such as bipolar disorder, and many others (Cleveland Clinic, n.d.).

Today, many neurodivergent people do not consider themselves disabled, despite recognizing the many physical, social, and political systems present

challenges that cause misfit (Stegink, n.d.). Often the language used to explain this dissonance draws from the personal tragedy theory of disability – the fraternal twin of the medical model, which posits that impairment is a mark of misfortune to be endured, struggled against, and overcome (Garland-Thomson, 2012). These arguments often include something along the lines of, ‘neurodivergence cannot be a disability; it is perfectly normal neurological differences between people that result in many strengths.’ Left unspoken is the assumption that to be disabled is to be both abnormal and unfortunate (McCrory, 2023). Not every non-disabled neurodivergent will use these arguments; there are many deeply personal and complex reasons why a person might not take on disability as an identity, such as feeling that their neurodivergence does not pose a serious barrier to achieving stability, happiness, and social connection – but the prevalence of these arguments can be deeply frustrating for disability advocates. I share many of these frustrations, particularly because they reinforce the siloed divide between disability and neurodiversity advocacy and creative work. Throughout this project, I take a social model approach to neurodiversity. I continue to refer to neurodivergence within the larger context of disability. However, I avoid imposing the moniker of disabled onto anyone who does not personally identify with it.

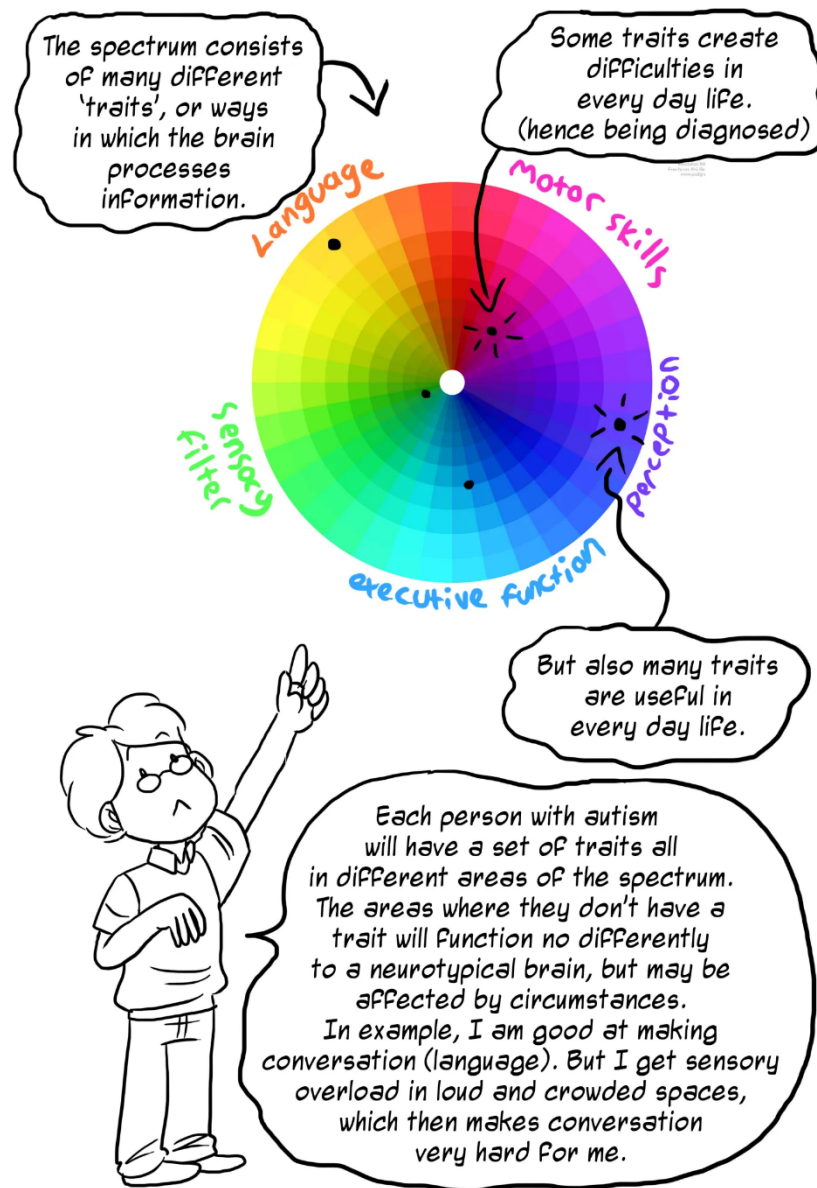
As the meaning of neurodivergence is so broad and I have no wish to pose myself as having lived experience of a neurotype I do not have, I have chosen for this research to take a more limited definition based on my own personal experience of neurodivergence: Autism, ADHD, and dyslexia. Autism is a neurotype associated with non-normative communication and socializing methods, non-normative sensory

sensitivity and/or processing, and a deep engagement with topics of personal interest (Autistic Self Advocacy Network, n.d.). Many in the Autistic community describe autism as a spectrum—not a binary spectrum that places an individual on a scale somewhere between “less autistic” and “more autistic” —or, in terms often used by both medical and research professionals, “high functioning” and “low functioning” (Good Health Psychiatric Services, 2022)—but rather a spider’s web with each radiating strand representing aspects that an individual may experience more or less intensely or may find more or less challenging to manage (Figure 1.01). This is not a static tool that can be used to categorize types of Autistics. A person who works full time and appears outwardly “functional” may struggle to take care of themselves at home (Green, 2022). As many Autistic people note, an individual’s experience with any of these aspects may (and often will) fluctuate throughout the day, or over months or years (Menhenett & Fogarty, 2024; Enna Global, 2024).

ADHD is a neurotype associated with hyperactivity, distractibility, non-normative sensory sensitivity/processing, and hyperfocus. Like with Autism, these experiences are individual to the person, with each ADHDer experiencing a range of intensities. These, too, fluctuate over time in response to environment, stress, and demands (UW Medicine, 2024). Scientists have only recently begun to realize what the ADHD community has known for some time: that ADHD has a similar impact on sensory sensitivities as Autism (Gur-Hartman et al., 2024; Panagiotidi et al., 2018). Dyslexia is a neurotype characterized by reading and language-processing learning difficulties and well as strong creativity (Sewell, 2022). It is one of a group of neurotypes which the DSM categorizes as Specific Learning Disabilities, although a

Figure 1.01 Panel from Rachel Burgess's 2022 *Understanding the spectrum – a comic strip explanation*

Image Source: the-art-of-autism.com



person's dyslexia often impacts their lives in both challenging and strengthening ways well beyond the classroom (Neff, n.d.).

There is a strong overlap in membership between the Autistic, ADHD, and dyslexic communities, with many individuals experiencing a mixture of two or all three neurotypes (Bonti et al., 2024). As a result, the spider web of individual

experiences can get quite complex, especially as the aspects of our combined neurotypes clash or harmonize as changes in our lives trigger changes within ourselves. However, while the relationship with our neurodivergence changes across time, we occupy the same spaces. As a result, any space designed for a Neurodivergent population must take into account a wide range of sensory and cognitive sensitivities and processing abilities.

The medical and science community uses a standardized understanding of these three neurotypes based on criteria in the Diagnostic and Statistical Manual of Mental Disorders, or DSM. As indicated by the use of “disorder” in the title, the DSM takes a solidly medical model view of all disabilities, including neurodivergences. The DSM, or the DSM-5, as the current revision is called, includes only the aspects of a “disorder” that may cause distress, may be seen as an impairment, may increase the risk of “suffering death, pain, disability, or an important loss of freedom” (Stein et al., 2010), p. 8, Table 1), or which may clarify a distinction between similar “disorders.” Revisions to the diagnostic criteria often lag behind well-established neurodivergent community and scientific knowledge. For instance, although sensory sensitivities (and hypo-sensitivities) have been recorded by scientist (and experienced by Autistics) even as far back as Leo Kanner’s pioneering description of Autism in 1943 (Commonwealth Autism, 2014), nine years prior to the first DSM edition’s publication in 1952 (American Psychiatric Association, n.d.). Yet the DSM did not include hyper- or hypo-sensitivities among the diagnostic criteria for Autism until the 2013 publication of the fifth edition (King et al., 2014).

Missing entirely from these medicalized definitions are the euphoria of an Autistic special interest (Nannery, 2020), the overwhelming and never-ending cacophony of ADHD thoughts (Kirejczyk, 2023), the incredible boost of self-confidence when a moment of “ADHD audacity” turns into another new skill (Gula, 2023), the frustration when having a thousand strengths and skills cannot make up for lacking skills in the things society expects (Matheou, 2022). Also missing are the many anecdotal experiences well known within these communities but largely unrecognized in the science community, such as a common Autistic dislike of being perceived by others (Lively, 2023; jellyrabbit, 2022).

Scientists have taken an increasing interest in understanding more about the experience of being neurodivergent, including the relationship between the neurodivergent mind/body and the surrounding environment. This research often draws from Sensory Integration theory, first developed by Dr. A. Jean Ayers in the 1970s (Guardado & Sergent, 2023). Ayers’s theory is similar to Garland-Thomson’s *misfit* framework and posits that sensory integration, that is, the way the brain takes in and processes sensory information, is foundational to function. *Dysfunction* in the sensory integration process leads to challenges in development, learning, and emotional regulation (Guardado & Sergent, 2023). Since the 1970s, Sensory Integration theory has helped to expand understanding of the human senses from the five basic senses (visual, auditory, olfactory, gustatory/taste, tactile) to include an additional three sensory systems: 1) vestibular, the sense of one’s head’s movement through space; 2) proprioceptive, the sensations from the muscles and joints of the

body; and 3) interoception, the sense of the internal functions of the body and organs, such as hunger.

Research has found that Autism, ADHD, and dyslexia all impact the integration of most or all eight senses. This impact is described in two ways, although some experts have begun to believe they are in fact part of the same processing function (Turjeman-Levi & Kluger, 2022). The first is the strengthening or weakening of sensitivity to sensory stimuli. For instance, someone may react more intensely to sounds if they are more sensitive to auditory stimuli, or they may struggle to feel grounded on the floor if they are less sensitive to proprioceptive stimuli. This dynamic is often described as hypersensitivity (more sensitive than the expected norm) and hyposensitivity (less sensitive than the expected norm). In some cases, sensory sensitivity may be influenced by the type of sensory input. Finnigan's *Sensory-Responsive Environments* research revealed a strong preference among Autistic, ADHD, and dyslexic people for biophonic and geophonic sounds over anthropogenic sounds (2024, p. 95).

The second way that these neurotypes affect sensory integration is by disrupting sensory processing (Sensory Processing Disorder, n.d.). An individual with disrupted auditory sensory processing, for example, may struggle to understand the words someone is saying even if they can hear the sound of their voice perfectly well (Mayo Clinic, n.d.). Both Autism and ADHD can cause disruptions in processing the five basic senses (Schulze et al., 2020; Robertson et al., 2017; Kirby et al., 2022), and Autism additionally affects processing of the three sensory systems (Kirby et al, 2022). The result is that neurodivergent people are more likely to engage in their

environment through the desire to seek sensations or to avoid or escape from them, may have a harder time interpreting cues, information, and input from their surroundings, and may be more challenged in safely navigating through the space. Interestingly, Autism has also been shown to improve local visual processing, or “attention to the local elements, contrast, and boundaries of an image at the expense of extracting a global percept” (Nayar et al., 2015, p. 1), above the expected norm (Maras et al., 2014). When an Autistic user views a landscape, they are more likely to take in and understand the detailed components of the space, rather than the full picture. Meanwhile, some studies now indicate that dyslexia may influence a greater than typical global visual processing (Maras et al., 2014), the opposite of local visual processing, dealing with, “segmenting scenes, extracting form from background, and recognizing objects,” (Nayar et al., 2015, p. 1). Dyslexia also appears to negatively affect some vestibular sensory processing and may influence the ability to process visual stimuli because of poor eye movement stability (Ölçek et al., 2023), implying that providing dyslexic users opportunities to be still not only increases their safety within the space, but also facilitates their elevated ability to take in the overall context of their environment.

Autism, ADHD, and dyslexia also influence the processing functions that influence the ability to navigate through space. These functions are a complex web with often partially overlapping systems, and I will not attempt to explain all that goes into the process of navigation. However some related functions are long-term and short-term memory, cognitive mapping (spatial and non-spatial), attention, planning, working

memory, and problem solving (Healy et al., 2023; Muffato et al., 2024; Thorndyke & Hayes-Roth, 1982; Weisberg & Newcombe, 2016; Wolbers & Hegarty, 2010).

Some studies indicate that people with Autism, ADHD, and dyslexia may use different executive processes than neurotypical people do while navigating through the physical environment, but often arrive at the same result (Del Lucchese et al., 2021; Lind et al., 2013). Autism and ADHD have stronger associations with executive functioning issues that may disrupt the ability to navigate, including learning and holding new topography in short-term memory (Faedda et al., 2021), planning routes and self-projection/scene construction/mental simulation (Lind et al., 2014), remembering landmarks (Ring et al., 2018), learning spatial patterns, and learning locations based on allocentric representations (map reading) (Smith, 2015). People with Autism are also less likely to explore their environment fully and are more likely to return to places they have already visited when looking for something (Smith, 2015). On the other hand, these same individuals tend to have improved abilities in perceptual distance matching, recalling locations from maps, and remembering route information from maps (Smith, 2015).

Dyslexia has less of an impact on wayfinding overall, although its association with left-right directional confusion (Ginsburg & Hartwick, 1971) and potential effects on spatial and geographical thinking (Klonari & Passadelli, 2024) can lead to difficulty following through on directional instructions. For all three neurotypes (Autism, ADHD, and dyslexia), attention issues exacerbate all other executive functioning (Kirby et al., 2022; Lind et al., 2013; Ring et al., 2018; Smith, 2015; Faedda et al., 2021; Taylor et al., 2016).

Anecdotal evidence leads me to suspect that neurodivergent users may often engage in circulation patterns and routes that are distinct from that of their neurotypical counterparts, driven by differences in attention, visual processing, and deeper relationships with personal interests. However, I could find few studies that specifically looked at the relationship between Autistic and ADHD ways of engaging in personal interests, and wayfinding or circulation patterns.

Both Autism and ADHD are associated with deep levels of engagement in topics the individual finds personally rewarding, although the method of this engagement differs somewhat. Autistic individuals are likely to engage in what are called special interests by perusing a deep, detailed collection of knowledge about a given subject, or by regularly associating to the topic through collecting, decorating private spaces, fashion, or ornamentation. Special interest are more than a hobby—they carry a strong emotional component as well. Among Autistic ways of socializing, one’s special interest is fundamental component of connection and communication (Long, 2025). Popular media, including movies, television, and literature, have long caricatured and distorted Autistic special interests into the harmful “idiot savant” or “autistic savant” (note: the lowercase here is intentional—this has no relation to the Autistic community itself) trope. In the U.S., one of the most well-known examples of this trope is the character Raymond Babbit (played by allistic/non-Autistic actor Dustin Hoffman) from the 1988 film, *Rain Man*, which helped to entrench the stereotype into the public conscious (Knights, 2018). While these fictionalized portrayals spread to misinformation, oversimplify the diverse spectrum of Autistic experiences, and place inappropriate and harmful expectations

on Autistic individuals (Owens, 2022), the real-life act of engaging in special interests brings a wealth of benefits for Autistic people, including increased self-confidence, increased emotional regulation, and self-soothing during or after unpleasant encounters (Laber-Warren, 2021). From a design standpoint, a neurodivergence-centered landscape may want to provide opportunities for visitors to engage in special interests by providing deep levels of detail about aspects of the site, or providing opportunities for visitors to collect specimens, inspect examples, or share information they may already have with others.

Both Autism and ADHD are associated with the second method of engaging with interest-topics: hyperfocus (Maras et al., 2014). Hyperfocus is a state of intense, sustained attention, often with an associated complete inattention to anything else in the environment or to other expectations or demands (Flippin, 2025). Unlike special interests, which can last anywhere from a few days to a lifetime, with longer stretches of time being more typical, hyperfocus lasts for much shorter bouts of time, typically on the scale of hours to days (R, 2022). The intensity of hyperfocus can lead to burnout if sustained for too long, but many neurodivergent individuals report feelings of euphoria, creativity, and elevated problem-solving (Stride, n.d.). A design that considers hyperfocus may include spaces to engage in activities or information that facilitate longer periods of engagement and protect users visitors from potential collisions with vehicles, people, or objects due to reduced attention to the surrounding environment.

In general, there appears to be scant research exploring the relationship between these neurodivergent experiences of interest engagement and patterns of

spatial navigation. As an ADHD Autistic, I find this oversight disappointing, although there is clearly a gap in the research. Speaking from my own experience, my special interests can significantly impact how I move through a landscape. When I find something related to my special interest, I am more likely to take a detour toward that thing and will spend more time with it. Hyperfocusing on a task or activity can significantly impact my situational awareness, but it can also lead to my decisions on how to navigate along a path. My local visual processing skills combined with my distractibility cause me to more easily find small details within the larger environment that interest me. My connection to those interests means I am likely to make more stops and at greater frequency than a neurotypical person. I have noticed these patterns in many of my neurodivergent friends, families, and colleagues, yet they go unmentioned in both design and neuroscience research.

Research and Guidelines on the Design of Outdoor Spaces for Neurodivergent

People

There is little research about how to design outdoor spaces for neurodivergent people. In an interview with Juliet Shoultz, Transportation Systems Engineer at the U.S. Access Board, Shoultz told me, “There's definitely a lot more conversation around [neurodivergence recently]. And what's mostly been happening is that type of inclusive design has been happening in homes, [and] in institutions for young people with developmental disabilities” (personal communication, October 22, 2024). Maci Nelson, Co-Founder of the NeuroScapes Design Collective, had an idea of why that may be the case: “That information is much harder to come across in public space because traditionally... when you look up neurodivergent individuals in their lives,

they are so shunned from history” (Nelson, personal communication, November 15, 2025). There is some indication of change, however. In January 2023, the State of New Jersey passed a law directing the New Jersey Department of Transportation to update its Complete Streets policy with design considerations for Autistic people and people with intellectual and developmental disabilities (IDD) (Rosenthal, 2023). The new law was based on a technical report published by Rutgers University in 2015, called *Detour to the Right Place: A Study with Recommendations for Addressing the Transportation Needs and Barriers of Adults on the Autism Spectrum in New Jersey* (Feeley et al., 2015), which was based on a series of interviews with Autistic people. Despite its full title, *Detour to the Right Place* had more to do with cataloguing the barriers Autistic people face related to transportation and pedestrianism than with design recommendations.

Examples comprehensive Autism or neurodiversity-focused landscape research and design guidelines are almost uniformly focused on spaces geared for children, including Sachs and Vincenta’s 2011 study, *Outdoor Environments for Children with Autism and Special Needs* and Menear et al.’s 2013 article, *A Multipurpose Fitness Playground for Individuals with Autism*. A Google Scholar search for “Autism,” “children,” and “landscape,” returned 88,100 results. A search for “Autism,” “Adults,” and “landscape,” returned 56,000. Broadening the search to “neurodiversity,” a search for children-related articles returned 6,630, while a search for neurodivergent adult landscapes returned 5,020, the vast majority of which deal with architectural, digital, and workplace environments, and not outdoor landscapes at all.

Other resources provide design guidelines more focused on architecture or are limited in scope. In 2022, the British Standards Institution published, *Design for the mind – Neurodiversity and the built environment – Guide*, which, while comprehensive, covers only indoor environments (The British Standards Institution, 2022). Two years earlier, a group of students at the Knowlton School of Architecture at Ohio University produced *Autism Planning and Design Guidelines 1.0*. Unlike *Design for the Mind*, the Ohio University report does cover outdoor environments, although it is limited to the right-of-way and parking areas. This is unfortunately true even for the chapter on park access and does not include any information on signage or wayfinding to aid in navigability, a key challenge for many neurodiverse people. In 2021, Danielle Toronyi proposed a research study to develop urban design guidelines to accommodate Autistic auditory and sensory needs, but the study was either never conducted or was not published (Toronyi, 2021). In 2020, Wenxi Huang won the ASLA Student Honor Award for her work titled, *Learn, Play, Thrive—Design Guidelines and Toolkit of Therapeutic Gardens for Children with Autism Spectrum Disorder*. Huang conducted a series of case studies of existing therapeutic gardens and interviews with researchers, landscape architects, and special education and behavioral support professionals to develop her guidelines for therapeutic gardens. Although these guidelines help fill the gap left by the other reports, they were developed without input from the Autistic community. In 2023, Michaela Ada completed her MLA at the University of Maryland with her thesis research, *A Place in Public Space: Designing an Autism-Friendly Experience for Adults in Palmer Park*, in which Ada explored strategies of adapting guidelines intended for interior

environments for an adult-specific autism-friendly community park design. Like Huang's research, Ada's methodology did not involve significant engagement with the Autistic community. However, her work offers some interesting design guidelines, for example, organizing areas based on their sensory qualities, the activities they support, and their intended functions (Ada, 2023).

Jensen's (2023) and Finnigan's (2023) more work represents leading design research in the field for taking a holistic look at how to assess and design for neurodiversity in the outdoor landscape. Jensen's MLA thesis used auto-ethnographic research for a deep dive into the dynamic nature of sensory sensorial landscapes, developing a visual language for representing sensory experiences and applying his explorations to a reevaluation of common design typologies (enclosure, edges, pathways) through the lens of Autistic experience. In the process, he developed a methodology for visualizing a landscape's complex sensory mosaic and how it changes throughout the year (Jensen, 2023). Also mention his student ASLA award. Finnigan took a qualitative participatory approach, interviewing thirty-one Autistic, ADHD, and/or dyslexic participants on their perceptions of the relationship between designed outdoor environments and sensory sensitivities. Through these interviews, Finnigan was able to learn not merely what environmental stimuli cause misfit with hyper- and hypo-sensitivities, but additionally drew information about wayfinding and orientation, and preferences for types of materials, as well as many other aspects related to existing in space. Finnigan's research did not include a set of design guidelines per se. However, as a work that elucidates not only barriers, but also *preferences*, it is a practical design guidance tool (Finnigan, 2023). Finnigan was

awarded an LAF Fellowship in 2023 to co-found the NeuroScapes Design Collective, alongside Maci Nelson, Mark Simonin, and Benjamin Jensen (Landscape Architecture Foundation, n.d.). In 2024, she published a peer-reviewed journal article, *Sensory Responsive Environments: A Qualitative Study on Perceived Relationships between Outdoor Built Environments and Sensory Sensitivities*, with data collected during her 2023 MLA research.

As sites for inclusive design, public parks benefit from an early adoption of universal design strategies. As early as 2000, the National Park Service officially integrated UD into their accessibility standards (National Park Service, 2000). Many parks departments now implement UD strategies as standard practice (Wen Huang, personal communication, September 19, 2024). For many disabled people, public parks provide a venue for outdoor activities, facilitate greater social inclusion, and improve health, well-being, and sense of independence (Labbé, 2018). The U.S. Forest Service (2013a, 2013b) responded by developing the Forest Service Trail Accessibility Guidelines (FSTAG) and the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) in 2013, based on an expansion of the Architectural Barriers Act to include outdoor developed areas on federal land (American Trails, 2018). These documents describe accessibility guidelines for public parks that expand the architecture-specific ADA regulations to include recommendations for trails, picnic areas, camping facilities, boat access, and other natural park-specific environments. The U.S. Fish and Wildlife Service has also hosted presentations about trail usability for adaptive hiking and biking for mobility device users (Brett, 2023). Unexpectedly, these guidelines match the ADA and ABA

focus on accessibility features primarily for blind/vision-impaired people and mobility device users, often specifically wheelchair users, and they focus on actions (hiking, boating, eating) rather than experience. However, Juliet Shoultz of the U.S. Access Board described a more complicated situation outside of federal and state parks. Smaller local park departments may struggle to implement accessibility features to these standards. Budget constraints are often cited as a reason to forgo any measures above the legal minimum requirements. For local parks, this precludes ABA standards, which can only be regulated on federal property. At other times, the people hired to manage the accessibility features within the department's service area may not know the full extent of the available guidelines (Shoultz, personal communication, October 22, 2024).

Jennene Blakely, Program Access Manager at Montgomery Parks in Maryland, noted that because public parks are publicly funded, there is an expectation that they will serve the whole public. Even if a park is accessible to other populations, choosing one group to prioritize in the design may unintentionally communicate that the park is not intended for anyone outside of that group (personal communication, October 23, 2024). However, even within the realm of inclusive design, designers are at times faced with the seemingly impossible task of designing for conflicting and multiple needs. Many of the experts I spoke with commented on this challenge. James Elliott, Senior Planner at Toole Design, used the example of how the implementation of curb ramps, which allowed mobility device users greater access to streetscapes, made it harder for vision-impaired and blind pedestrians who used the curb edge to identify and align themselves to crosswalks. They added that, on the other hand,

detectable warning surfaces often negatively impact mobility device users. Shoultz used the example of an Autistic individual's need for quieter space conflicting with the audio cues used to guide blind or vision-impaired individuals. As she explained,

So then that gets you to, well, let's provide people who are blind with something on an app, on a phone. Right? That way, they're the only ones hearing the information that they need to navigate the space. That sounds like a great idea until you talk about the socioeconomics of that. That is assuming everybody who's blind has access to a phone that can download all these apps. So it's very tricky, and I'm really interested to see how the world of architecture and engineering addresses those combined and maybe at times conflicting needs. I think it really is a challenge. (Personal communication, October 22, 2024).

Designing a Methodology for Neurodivergent-Centered Design Research

It was clear from the start that this thesis project would require a thoughtful methodology. The best methodology for projects of this type includes participatory design. Alexa Vaughn speaks extensively about the importance of participation in any design intended for disabled visitors in her lecture, *Design with Disabled People Now: Including Disabled People in the Design Process* (Vaughn, 2021). Early in the thesis project, I felt that it was important to incorporate some form of visual-arts-based participatory method. I took inspiration from Knowles and Thomas's (2002) visual arts-based participatory study on students' sense of place and self in school. Visual arts-based participatory methods involve research participants creating art that

ultimately both serves as and represents data. Frequently part of mixed/multimethod research designs, these practices are well suited to establishing key themes that may inform the protocol of later stages (Leavy, 2015). Additionally, studies conducted with disabled participants often do not fully consider the frequent disempowerment disabled people experience in scientific and medical environments (Eckhardt & Anastas, 2006). By facilitating free expression through the medium of visual arts and by encouraging participants to interpret their work in their own words, visual arts-based participatory methods have the potential to be more empowering for research participants than other methods (Leavy, 2015).

Another approach I explored for its potential applications is Vaughn's accessibility audit methodology (Vaughn, personal communication, October 22, 2024). Vaughn's audits are led by disabled experts who have already mapped the accessibility successes and failures of the site before the walks take place. The audits frequently engage non-disabled audiences and serve a teaching and advocacy purpose rather than a research purpose; (Vaughn, personal communication, October 22, 2024). Nevertheless, I took the idea of auditing a space for its ability to foster *fit* as an inspiration for developing my methodology, which I will describe in the next chapter. I also took inspiration from other existing sensory audits, which are assessments taken of a usual indoor space on how well it may accommodate individuals with sensory sensitivities (Autism Education Fund, n.d.). I looked at several examples, and almost universally these sensory audits are designed for classroom settings and only assess for potential triggers for hypersensitivity. I also found the language to be challenging to adapt to an outdoor setting; it often has more to do with organizing

student behavior than the physical space (e.g. “Dinner halls and queuing systems do not cause distress (due to the noise levels, smells and crowds)” (Autism Education Fund, n.d., p. 6). In the end, I took more inspiration from the overall existence of these sensory audits than I did from their actual methodology.

Conclusion

DCD shows great promise as an inclusive design strategy that embodies self-determinism and attention to holistic experiences, yet within the field of landscape architecture, its has yet to be tested in the built environment, much less against the specific constraints and expectations of natural public parks. In the next chapter, I will begin by defining DCD, explore how I arrived at that language, and sketch a rough framework for what DCD is and is not. Then I will discuss my methodology for testing DCD’s application in natural park designs. I will begin by describing my strategy for site selection and exploring the history and conditions on the site through my site inventory and analysis. In the final section, I will review my methodology, and the data gathered during the participatory research stage, and how these elements contributed to the final design.

Chapter 3: Methodology

In this chapter, I explore my process of establishing a definition for disability-centered design and document the research methodology that informed my final design solution. In the first section, I trace the evolution of my understanding of disability-centered design, examining its principles and how they will inform my approach to centering neurodiversity in the design of a public park. In the second section, I conduct a comprehensive inventory and analysis of the design site, which includes the Lower Serpentine Barrens Conservation Park, evaluating key aspects such as the regional context, history, hydrology, plant life, soils, and erosion patterns to gain a holistic understanding of the landscape. In the following section, I identify the archetypal landscapes that will serve as guiding frameworks for my design process. Lastly, I present the methodology and results from participatory research, engaging neurodivergent community members to inform the design decisions and ensure the space serves both the natural environment and the diverse experiences of its visitors. Through this multi-step exploration, I aim to establish a community-directed design process that successfully applies a disability-centered design approach to a public park landscape.

Defining Disability-Centered Design

After reviewing the literature, I felt reasonably confident that I had identified a newly emerging disability-focused approach to landscape design that could not be explained by any existing approaches. In the previous chapter, I discussed how I had termed it Disability-Centered Design (DCD), which I was also reasonably confident did not already refer to something else. But what, exactly, did I mean when I said

“disability-centered design”? And how would someone know whether they were using DCD? I needed to articulate my conceptual understanding of DCD, and to do so, I needed to answer six questions: 1. Do other design professionals (especially disabled designers) agree that DCD describes a distinct phenomenon? 2. What language do I use to define DCD? 3. How, where, by whom, and at what scale is DCD applied? 4. Would the designers of the exemplars I initially identified recognize their work as representatives of DCD? 5. What is the epistemological and practical relationship between DCD and Universal Design? 6. What further questions am I unable to resolve at this time?

To begin answering these questions, I spoke with landscape design and therapeutic landscape professionals whose work has influenced national conversations about landscapes of disability and inclusion. I also drew from the writings of disability advocates such as Rosemarie Garland-Thomson and Aimi Hamraie to not only develop my understanding of what disability-centered design *is*, but also what I *want* it to be. With so many similar design strategies already in existence, giving a name and definition to DCD would be a pointless task without a compelling reason to differentiate this approach. For me, that reason was the potential for DCD to serve as a radical disability justice-making and teaching tool. I wanted to encode disability justice as an integral aspect of disability-centered design.

Do other (disabled) design professionals agree that DCD describes a distinct phenomenon?

Fortunately, the experts I spoke with confirmed that the emerging design strategy I described as disability-centered design was legitimate and that they were

familiar with it. Alexa Vaughn, Deaf landscape designer and author of DeafScape, revealed that she had independently recognized the distinctiveness of the approach and, for lack of a better name, had been referring to it as “disabled human-centered design.” She concurred that human-centered design alone was not a sufficient description for the approach and also confirmed that she had not encountered the phrase “disability-centered design” anywhere in her work as an accessibility specialist.

What language do I use to define DCD?

My current definition of disability-centered design (DCD) is: ***The art and practice of design that celebrates disability by centering the unique patterns of disablist spatial experiences.***

When I first began crafting the definition, I chose to borrow the opening phrase from Salmen’s (2011) definition of Universal Design (UD) in the *Universal Design Handbook*: “[T]he art and practice of design...” My journey to defining disability-centered design started with taking a critical look at UD as a justice-making strategy. Although I did not yet know what the relationship between UD and disability-centered design looked like, whether they were opposite or complementary strategies, I knew that a relationship existed. The adoption of this opening phrase reflects that. UD has had many definitions since its conception. I chose Salmen’s definition over any other for two reasons: The first reason was formality and legitimacy. Smith and Preiser’s 2011 *Universal Design Handbook* is a well-established epistemic resource and reference tool for UD. The second reason is in the language itself. Unlike in most other definitions, Salmen chose to represent both the

philosophical (“art”) and practical (“practice of design”) uses of UD. I wanted to do the same for disability-centered design.

Salmen follows his opening phrase with, “*to accommodate* [...]” This use of the grammatical infinitive of purpose establishes accommodation as UD’s primary objective. Under this definition, accommodation is both the way UD is enacted and the underlying motivation for action. Although I had linked disability-centered design to UD in the opening phrase, I felt that here it was important to differentiate DCD as a fundamental departure from other inclusive design approaches. Disability-centered design is not merely a new avenue toward the destination of access and accommodation. It is intrinsically linked to what Rosemarie Garland-Thomson (2012) calls “disability conservation,” promoting the advantageous expertise that being disabled can generate and tapping into what bioethicist Jackie Leach Scully calls, “‘experiential gestalts,’ or ways of knowing shaped by embodiment that are distinctive from the ways of knowing that a nondisabled body develops as it interacts with a world built to accommodate it” (Garland-Thomson, 2012, p. 346). Disability-centered design assumes disabled adaptability, creativity, and resourcefulness, placing the disabled individual in the role of designer and integrating active, meaningful participation by disabled community members in the design process. At its core, DCD departs from accommodation modes of design by de-emphasizing the importance of non-disabled expertise and experiences, linking to a legacy of design activism where, as Director of MASS Design Group's Deaf Space and Disability Justice Lab Jeffrey Mansfield describes, “Self-determination became a form of resistance” (Allen, 2021, para. 5). My definition of disability-centered design codifies

this distinction by adding the restrictive relative clause, “*that celebrates disability...*” after the initial syntactic segment, “*The art and practice of design...*”

In the initial draft, I continued with the prepositional phrase, “*by focusing on...*” Occupational therapist and Universal Design consultant Amy Wagenfeld suggested improving this word choice, saying, “[F]ocus is not right. Focus to me is very clinical [...] I am putting you under the microscope and I’m inspecting you.” In the final version, I drew vocabulary from the DCD’s name to replace “*by focusing on...*” with “*by centering...*”

The next segment also underwent a series of revisions. My first iteration read, “*the unique expressions...*” Over time, I began to feel that “*expressions*” was not quite the right choice, although I struggled to pinpoint why. After some time wrestling with it, I tentatively settled on, “*the unique needs and expressions...*” One member of my thesis committee pointed out that this change introduces an association with medicalization that I was specifically trying to avoid. After some reflection, I ultimately settled on, “*the unique patterns...*”

The final phrase of the definition has remained largely unchanged since the first iteration: “*of disablist spatial experiences.*” Here I am anchoring disability-centered design in disabled ways of knowing space by linking it to the concept of disablist space that I explored in the previous chapter.

Benjamin Jensen, co-founder of the NeuroScapes Design Collective, suggested adding language to the definition to clarify how and when DCD is used. As he said, “What is it being centered on? Is it being centered in the design intent? Is it being centered in the design process? [...] Because I think centering it would look

different if it is from a botanical garden management moving forward after design. It would look different than if you're talking about within the design phase of a project.” These are very good points, and ones I struggled to resolve, in part because there are still many aspects of how DCD fits into landscape design practice (both individual practice and the broader field) that I am uncertain about. Furthermore, I felt that the more exactly I drew the boundaries between what is and is not DCD, the less usable DCD became as an exploratory tool, and the greater the risk became of DCD becoming a marketable product following in the steps of UD’s meaning-loss. For these reasons, I decided not to add additional qualifiers and intentionally left some ambiguity within the definition.

Thus, to reiterate, the complete definition of disability-centered design is: ***The art and practice of design that celebrates disability by centering the unique patterns of disabled spatial experiences.***

How, where, by whom, and at what scale is DCD applied?

DCD is still in its early development, and this nascent stage means there are few examples in the field of landscape architecture from which to draw conclusions. Many of the answers to these questions will need to be developed over time. However, the current repertoire can provide us with a few parameters. DCD’s strength lies in its specificity. DCD seeks to prioritize a narrow scope of disability and utilize that focus to create deeper and more affirming connections with the experiential gestalts of the targeted communities. DCD design is created by disabled designers and is not influenced by able, normative priorities. A non-disabled landscape architect collaborating with disabled community members at every stage of

the design process does not exemplify DCD, even though it may exemplify human-centered design. DCD may encompass design research, design knowledge-making, and space-making, but it is not a set of standards that can be applied to a landscape to achieve DCD status once certain criteria are met (as modeled by LEED and SITES), nor is it a checklist of qualities meant to describe a landscape, like the 7 Principles of Universal Design we encounter.

Would the designers of the exemplars I initially identified recognize their work as representatives of DCD?

I asked Alexa Vaughn (DeafScapes), NeuroScapes Design Collective Co-Founder Kathryn Finnigan (Sensory Responsive Environments), and Benjamin Jensen (Designing Spectrums) if they would consider their own work to be disability-centered design based on my description and draft versions of the definition. I was relieved to hear Vaughn enthusiastically agree that she would consider DeafScapes an example of DCD. Jensen and Finnigan were more hesitant about making a connection, which may complicate my earlier description of DCD. Jensen described his spectrum mapping methodology as a tool that could be used for DCD but declined to frame the methodology itself as an example of DCD. Finnigan's reservations reflected the broader complex relationship between neurodiversity, disability, and identity that I discussed in the previous chapter. Speaking about her research on sensory-responsive environments, Finnigan said, "I wouldn't say that every person I spoke with or interviewed represented themselves as being disabled or having a disability," (personal communication, November 4, 2024).

What is the epistemological and practical relationship between DCD and Universal Design?

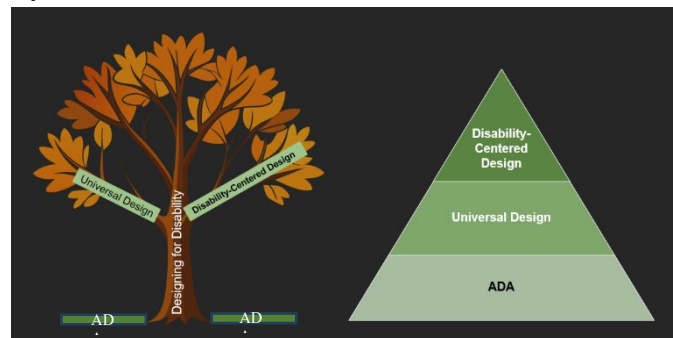
I explored the relationship between UD and DCD with each professional, hoping we would collectively identify the best way for the two methods to interact. In the end, I could not find one clear and succinct way to describe the interplay between DCD and Universal Design. Instead, I have two imperfect models that describe this relationship in opposite ways; yet, I believe that both can be correct at the same time. I encourage others to debate the validity of these models and to develop their own.

I refer to the first representation as the tree and branch model (Figure 2.00).

In this metaphor, the intention to design for disability is depicted by a tree. It is rooted in and nourished by ADA, which serves as the soil from which it has grown. Two branches emerge from opposite sides of the tree. One branch symbolizes DCD, while the other represents UD. This way, designers engaging in inclusive design can choose either the DCD or UD branch. Viewed through this model, designers evaluate which approach best addresses their specific design challenges and goals. Jensen explored a similar model, saying,

There's a gap between disability-centered design and Universal Design that is a big question mark space of, 'what do you do with conflicting

Figure 2.00 Left: Tree and branch model. Right: Pyramid model.



needs and conflicting experiences?’ I think disability-center design answers by being really specific about who you're designing for and limiting the number of conflicting needs. And then Universal Design answers that by being so over generalized that [it] might not work for anyone. (Personal communication, November 18, 2024).

Vaughn proposed a variant that marks the leaves as “participation” to highlight the significance of including participation by disabled stakeholders and community members in the design process for both design approaches. I concluded that this risked overcomplicating the metaphor, although her point about the importance of participation is valid.

I refer to the second representation as the pyramid model. The pyramid shape comes from a suggestion made by Wagenfeld during one of our conversations. In this model, UD is based on and builds upon a foundation of ADA. DCD, in Wagenfeld’s words, “take[s] Universal Design a step further,” (personal communication, September 23, 2024) enhances the pyramid further to form the peak. In this way, UD transforms access into inclusion, and DCD transforms inclusion into fit. Viewed through this model, designers begin with the principles of UD and then refine their design to achieve a particular experiential gestalt.

What further questions am I unable to resolve at this time?

There are plenty of questions about DCD that I cannot answer within the scope of this MLA thesis project. I do not have a clear understanding of how DCD functions across scales or whether particularity and specificity become unfeasible for sites or projects beyond a certain size. Can DCD be successfully employed for

redesigning or modifying an existing designed landscape? Although I view DCD as a justice-making process, I am unsure if there is a specific change goal that DCD aims to achieve or if its value lies solely in its transformative capability to create fit through the creativity and resourcefulness generated by the experience of being disabled.

Many of these questions will be answered over time as more disabled individuals engage in and test the boundaries of DCD. However, I personally feel that not all of these questions need answers. NeuroScapes Design Collective Co-Founder Maci Nelson echoed these feelings during our conversation, saying:

[Firms often ask for] actual implementable tools so we can think about how we design for everybody better. And I'm like, I think you're missing the point. [...] Even though it's not a bad question, you might be asking the wrong question, or you're only asking a question based off of your perspective that you think is the most valuable. The person is refusing to accept that there is a larger problem, which is why we haven't gotten to that solution yet. (Personal communication, November 15, 2024).

Some ambiguity will also enable DCD to change and evolve over time as our understanding of space and disability develops.

There are some questions, however, that I will seek to answer through this thesis project. They are: Can DCD be used to design public landscapes? How well can it navigate the legal and perceived requirements for who needs access, who can use, and who can claim social ownership of public spaces? Many professionals I

spoke with commented on the challenges of applying DCD to public spaces.

Wagenfeld posited that public space may even be DCD's greatest challenge.

Although this project may not yield definitive conclusions, I will explore these themes during my participatory research and in a design solution for the Lower Serpentine Barrens Conservation Park.

Finding and Defining The Site

In the early stages of developing this project, guided by the literature on the impacts of ADHD, Autism, and dyslexia on spatial, sensory, and navigational processing, I defined three priority areas for design research: wayfinding/navigation, interpretive signage, and sensorily-determined spaces, i.e., spaces designed in response to and to produce certain sensory experiences. In choosing a site, I sought a location that could accommodate and support all three priorities. I also preferred a site within a reasonable travel distance from the College Park/Silver Spring area for convenient visits and for bringing participants to the site.

My first introduction to the Lower Serpentine Barrens Conservation Park (LSBCP) occurred in the fall of 2023 during my Landscape Construction Methods and Materials course. For the final project, we were tasked with designing and developing a construction document set for a trailhead area of the LSBCP on the adjacent land parcel owned by Glenstone Museum. It was during this project that I first visited the site for a guided walkthrough of the park, led by experts from M-NCPPC and representatives from Glenstone. The information about the park and the neighboring Glenstone property that I gleaned during that walkthrough and throughout the course has informed this project. However, I have sought alternative

sources to confirm any details for which I do not have written records from the fall of 2023. This includes information about the serpentine barrens ecosystem, the impact of the serpentine rock, and the evolving relationship between Glenstone Museum and M-NCPPC concerning this site.

Early in the process of identifying a site for this thesis project, I found the LSBCP especially attractive because of its unique ecology, absence of existing trails or facilities, and the opportunity to incorporate elements of art due to its association with Glenstone. The LSBCP provided a blank slate for design; I would not have to worry about retrofitting an existing design that might not ultimately respond to the results of the participatory research I aimed to conduct. Additionally, I not only found the serpentine barrens ecosystem fascinating, but I also suspected it would align well with my focus on interpretive signage.

The LSBCP is not currently a high-priority site (Olek, personal communication, March 7, 2024). Before settling on the LSBCP as my project site, I explored possible alternate options with Sandra Olek, Director of the Office of Outdoor Recreation at Maryland's Department of Natural Resources. Olek identified two sites, both in the Eastern Shore region of Maryland, that were higher priorities for facility updates (Olek, personal communication, March 7, 2024). After exploring these sites, I ultimately decided against both due to the long travel distance.

Fortunately, based on my conversations with experts, Montgomery County may be an ideal place to explore emerging approaches to accessible design. Although primarily focused on the right-of-way, Montgomery County has proactively adopted accessibility guidelines that exceed the current legal minimum requirements. James

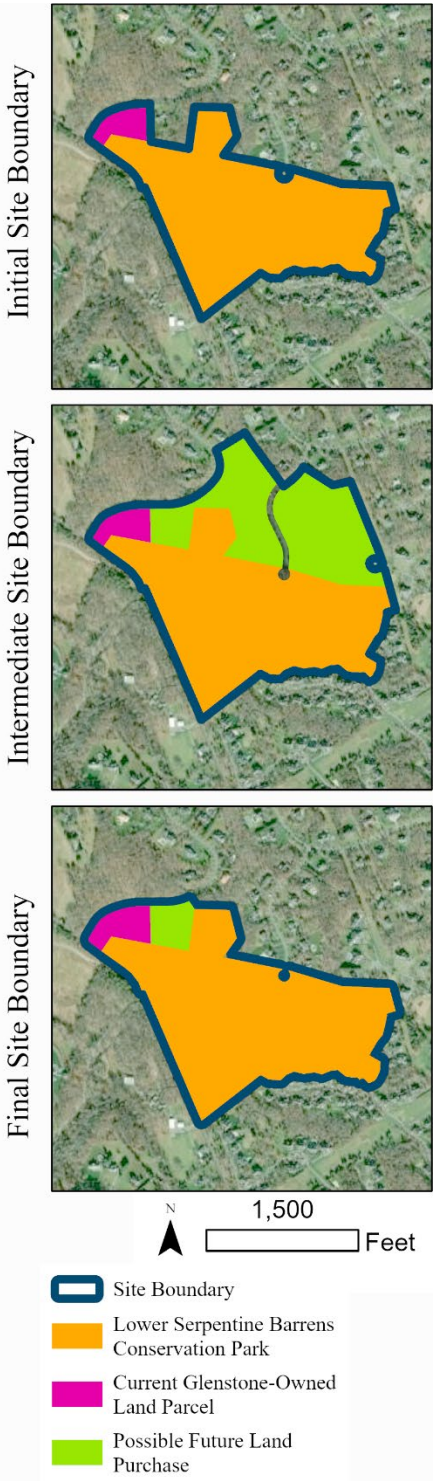
Elliott, Senior Planner at Toole Design, specializing in accessibility features within the Right-of-Way, reported,

They're integrating [the Public Right-of-Way Accessibility Guidelines] and trying to address the gaps in it and trying to be a leader in accessibility. They're also under some pressure from advocates in the county. There are a lot of the national level disability groups located in the area in Montgomery County. (Personal communication, October 10, 2024).

However, just as elsewhere in the U.S., neurodiversity remains a largely unexplored aspect of the county's accessibility initiative, especially within the built environment. Wen Huang, Project Manager at M-NCPPC, said, "We focus mostly on the physical disability aspect. For neurodiversity disability, we are mostly looking for services rather than design." Huang confirmed that the few neurodiversity-centric designs M-NCPPC is implementing within their park system are limited to retrofit upgrades of existing playgrounds, making them safer for children with intellectual and developmental disabilities. Yet she expressed an interest in exploring accessible park space for neurodivergent teens and adults, citing a need for resources and guidance on how to implement such spaces. From these conversations, I see potential for linking Montgomery County and M-NCPPC's existing priorities with the growing research in designing for neurodiversity/Autism emerging from the field of landscape architecture.

Once I confirmed the LSBCP as my project site, the next step was to define the site boundaries. I knew from the start that I wanted to include, at a minimum, the

Figure 2.01 Site boundary evolution over time



conservation park and the adjacent Glenstone-owned parcel (see Figure 2.01 for a comparison of site boundaries from my initial concept to the finalized project site). I also knew I did not want to tackle a combined Lower and Upper Serpentine Barrens Conservation Park, as I would lose the ability for specificity, transforming the thesis into a master plan project. During the participatory research stage, described in more detail below, I explored a theoretical future park boundary that might exist sometime between the present day and a future where the two parks are united (see “Intermediate Site Boundary” in Figure 2.01). This site boundary assumed a future in which many of the residential properties between the two parks had been purchased by either Glenstone or Montgomery County. Although this potential park boundary would necessarily exist far in the future, if at all, it had the benefit of including land that, having been disturbed through residential development, might be

more easily restored into a meadow landscape representative of the historic expression of the serpentine barrens. This process had precedent within Glenstone Museum, would visually tie the park landscape to the museum, and would provide more opportunity to incorporate aspects of participant feedback from the meadow area of the site walkthrough described later in this chapter.

Ultimately, however, to enhance the immediate usefulness of this project as a resource for Glenstone Museum and M-NCPPC, I returned to a site boundary that is closer to my original intention (see “Final Site Boundary” in Figure 2.01). The project site also includes a current residential plot that, due to its borders shared on three sides with both Glenstone and park property, is likely to become a priority acquisition site for Glenstone in the future. This boundary creates a more unified trailhead area and increases the space for wheelchair and mobility-device accessible pathways. As I explain later in the next chapter, I regarded the area of the site that currently exists as a residential property as a “Stage 2” area of the design, which may be incorporated into the site design after the property is purchased.

Site Inventory and Analysis

I employed four methods for my site inventory and analysis: expert conversations, site visits, GIS mapping, and historical research using both primary and secondary sources.

My inventory and analysis of the site began with a series of expert conversations that continued intermittently throughout the research phase, primarily conducted over Zoom (two were by phone). I spoke to a total of seven experts, recruited through my academic network, in-person during the American Society of

Landscape Architects conference, and based on recommendations from other expert interview participants. I engaged a mix of disability and accessibility experts, along with those familiar with the LSBCP site, including staff from M-NCPPC, Glenstone Museum, and a long-time local resident.

I conducted three site visits in September 2024, October 2024, and February 2025. During these visits, I used photographs, video recordings, and written notes to assess potential access points, evidence of past human use of the landscape, and indications of declining ecological health. I also logged information about the sensory qualities—sights, sounds, and textures—I encountered throughout the site, which I then used to generate sensory input maps. These visits took place within the LSBCP, the adjacent Glenstone-owned property, and occasionally at nearby historically significant locations. I did not enter the private residential property identified as my site's “Stage 2” area due to a lack of permission.

Thirdly, I utilized GIS mapping to inventory and analyze the site. These maps primarily relied on M-NCPPC GIS data obtained online, while I also created new data sets based on an analysis of raster images, personal observations made during site visits, historical research, and information gathered from conversations with experts.

Finally, I used a combination of primary and secondary sources for my historical analysis. Primary sources included historical maps and aerial photos, reports from Montgomery County and the M-NCPPC, and news articles. Secondary sources comprised Montgomery County educational publications, reference books, and reports concerning the Serpentine Barrens Conservation Park. Additionally, I gathered information from posts by longtime and former residents of the Travilah

community on a Facebook page and confirmed that information during a conversation with Guy Semmes, a community member and former resident of a property that has since become part of the LSBCP.

Regional Context

The project site spans a total of seventy-three acres in the unincorporated Travilah area of Montgomery County, Maryland, with sixty-five acres belonging to the LSBCP. It is approximately a fifteen-minute drive from the two nearest downtown areas in Rockville and Gaithersburg, and a twenty-minute drive to the Washington, D.C. border.

The LSBCP is part of a larger Serpentine Barrens Conservation Park that includes an upper section separated from the LSBCP by a subdivision (Figure 2.03). The Upper Serpentine Barrens Conservation Park borders a serpentine stone quarry, also known as the Holcim Mid-Atlantic Travilah Quarry or the Rockville Crushed Stone Quarry. Although the quarry remains active, M-NCPPC has started planning for its acquisition as a potential extension of the park once quarry activities cease (The Maryland-National Capitol Parks & Planning Commission [M-NCPPC], 2007).

The project site borders property owned by Glenstone Museum on two sides, which are extensions of the Glenstone-owned area (Figure 2.04). The private contemporary art museum occupies most of the Glenstone property located directly across Glen Road from the project site. Other Glenstone areas have also been utilized

Figure 2.02 State and County Context

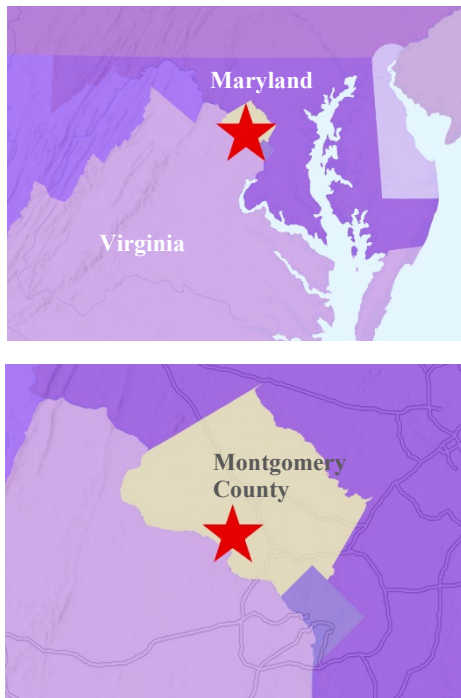


Figure 2.03 Upper and Lower Park Portions and Serpentine Quarry

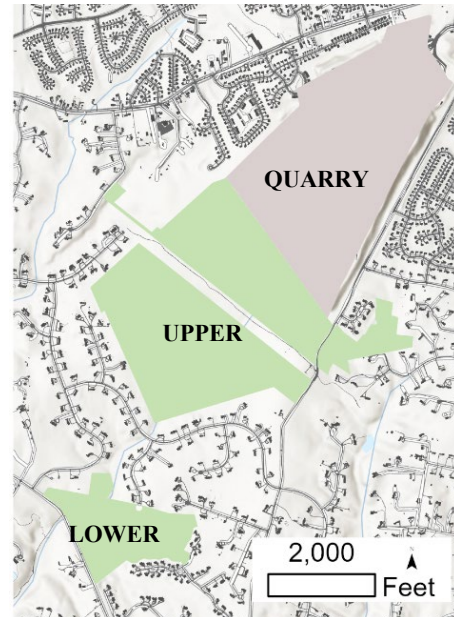
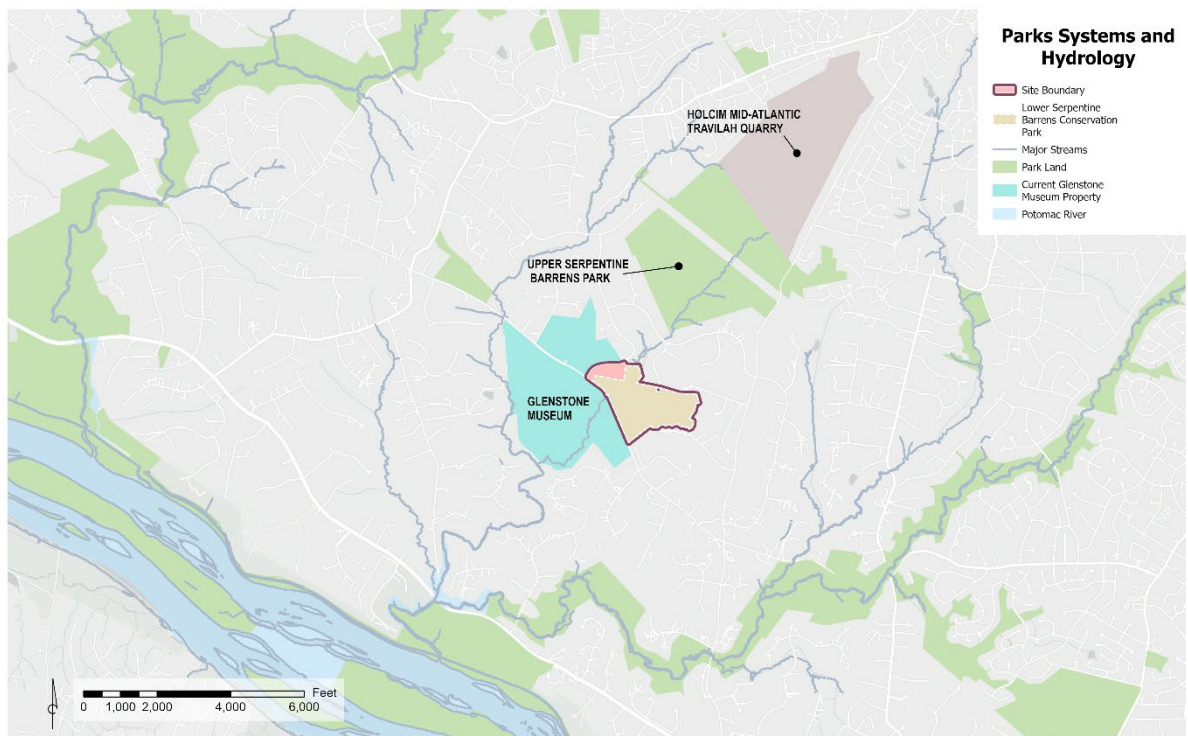


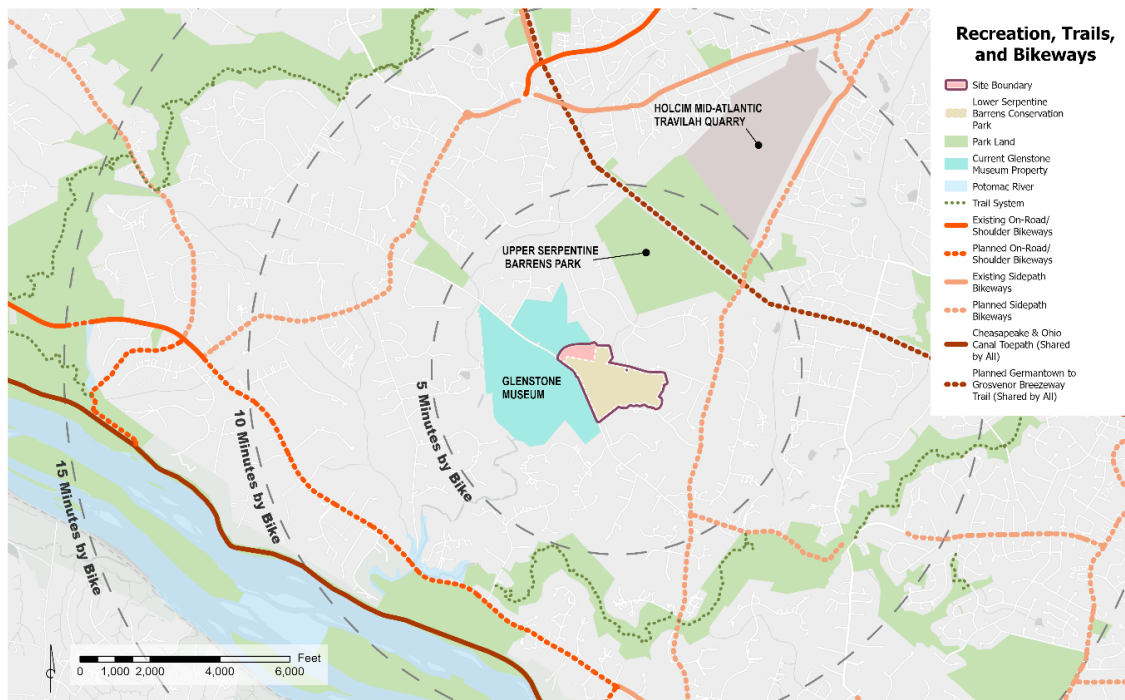
Figure 2.04 Regional Park Systems and Hydrology



to support Glenstone’s environmental restoration priorities or to provide additional conference and office space for the museum.

On a broader scale, the site is nestled within a ring of nearby parkland: the Potomac River to the south, Muddy Branch Park to the west, the Upper Serpentine Barrens Conservation Park to the north, and Watts Branch Park to the east (Figure 2.04). Unfortunately, there are currently no recreational or ecological corridors linking the site to any of these green resources. The LSBCP may be disconnected from nearby open space, but the conditions onsite can directly affect other protected areas. Runoff originating from the Upper Serpentine Barrens Conservation Park and collected onsite at the LSBCP flows downstream along the Greenbriar Branch stream, ultimately emptying directly into the Potomac.

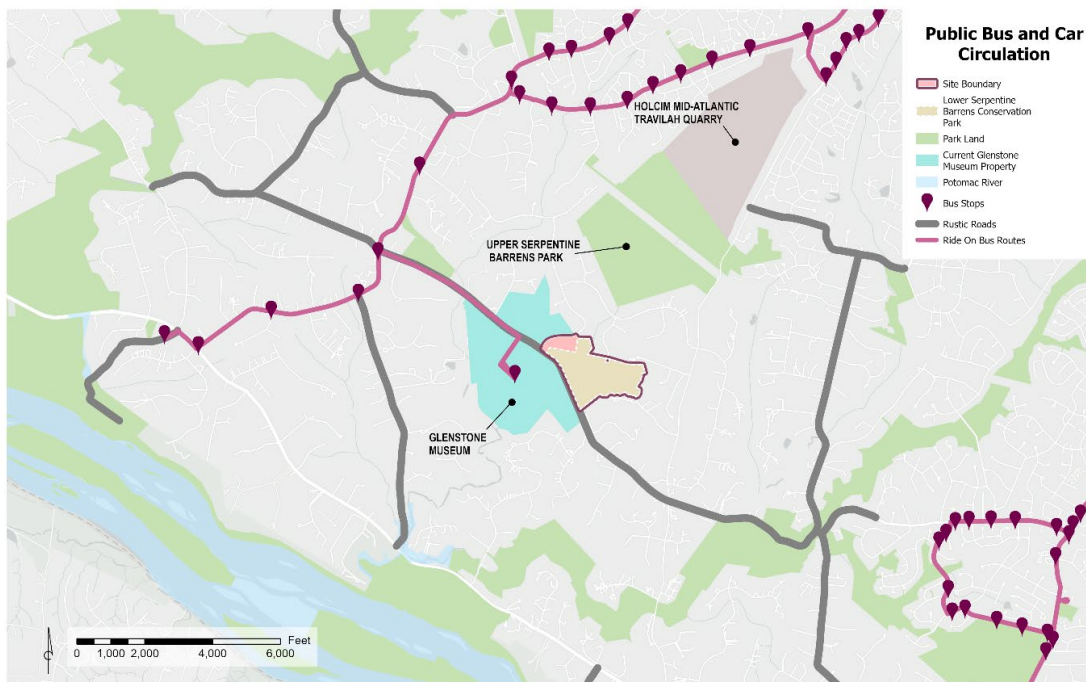
Figure 2.05 Walking, Cycling, and Combined Use Trails – Current and Planned



Future master planning may create connections throughout this park system using a network of footrails and bike lanes (see Figure 2.05). Although the existing bike lane and shared (bike and pedestrian) trail system primarily runs along the Potomac and separately in northern areas near Gaithersburg, the proposed future pathways will bridge the gaps to form a unified system (Montgomery Maps, 2023). If the LSBCP can connect to this system via Glen Road or the Upper Serpentine Barrens Conservation Park, visitors could access the site through this ring of recreation paths, allowing for cross-programming with the nearby park systems.

Due to the distance from urban centers, however, most visitors will likely travel to the LSBCP by motor vehicle. For users of public transportation, only one bus route approaches the site: a single route of the Montgomery County Ride-On bus system services the Glenstone Museum (Figure 2.06). Currently, there is no

Figure 2.06 Public and Private Motor Vehicle Circulation



pedestrian pathway between the entrance of the Glenstone Museum and the LSBCP site, preventing this bus stop from serving both the Glenstone Museum and the conservation park, as well as creating a significant accessibility barrier for visitors who cannot drive or ride a bicycle to the park. Unless an additional stop is added to the Ride-On line that services the park directly, implementing an ADA-compliant pathway from the bus drop-off location to the park would enhance access to the site.

For visitors who drive (or are driven) to the park, Glen Road offers a scenic experience to the site. It has been designated as a rustic road, defined by Montgomery County as, “historic and scenic roadways that reflect the agricultural character and rural origins of the County” (Figure 2.06) (Montgomery Planning, n.d.). This designation provides an opportunity to promote the LSBCP as a local and visiting tourist destination alongside the rustic road system.

Site History

Serpentine rock, or serpentinite (Figure 2.07 – 2.08), is an ancient alkaline rock that formed within the Earth’s upper mantle as early as 3.8 billion years ago. Recent theories suggest that it may have played a significant role in the formation of life on Earth (Sleep et al., 2011). Terrestrial exposure of serpentinite likely occurred approximately 450 million years ago due to shifting tectonic plates and can now be found in only a few locations worldwide (M-

Figure 2.07 Outcrop of serpentinite bedrock colored by moss and lichen



Figure 2.08 Beautiful serpentine boulder about three feet all



NCPPC, 2007). In North America, serpentine soils are located only within a discontinuous band stretching from Alabama to Newfoundland. Maryland and Pennsylvania alone account for nearly 90% of the total acreage of North American serpentine soil (M-NCPPC, 2007).

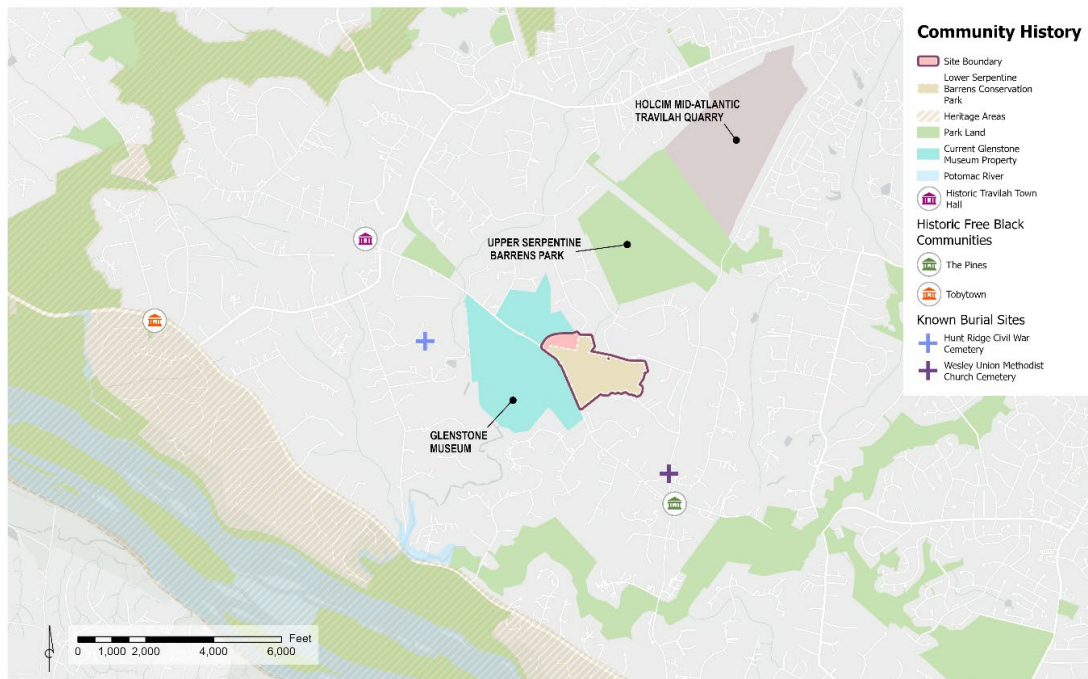
Serpentine soils are characterized by their shallow depth, high erodibility, significant clay content, low water-holding capacity, elevated concentrations of heavy metals, high levels of magnesium, and deficient essential nutrients needed for plant growth (Arabas, 2000). This creates an environment in which few plants are well-adapted to survive, earning the ecosystem the label “barrens.” Serpentinite has been quarried in Maryland for a long time, appreciated for its use as decorative building stone, road material, and a historic source of chromium ore (M-NCPPC, 2007).

Before colonial settlement, tens of thousands of acres of prairie-like grasslands, dotted with blackjack and post oaks, stretched across northern Maryland and Pennsylvania. These lands were maintained through indigenous fire management practices (M-NCPPC, 2007), likely by the Susquehannock and/or Piscataway tribes (Native Land Digital, 2015). While I could not find confirmation that the Travilah area also contained managed grassland, I did come across information regarding the Manahoac, whose territory extended north of the Potomac River and overlapped with

the Piscataway. They used fire to maintain prairie land across the river in what is now Loudoun County, Virginia (Chambers, 1983).

European colonial settlements pressured indigenous groups to abandon intentional fire land management practices, while simultaneously employing land purchases and treaties to restrict tribal groups from accessing more of their ancestral lands. Over time, the absence of fire management allowed second-growth woodlands to replace grasslands. Most serpentine barrens patches in Maryland have since somewhat naturally afforested, with the unique exception of the Montgomery County patches, which have retained an oak and hickory forest cover (M-NCPPC, 2007). The persistent forest cover on these sites may be attributable to the presence of some alluvial soil, possibly the result of the Potomac River once flowing over the area (cobbles of an ancestral Potomac River or mainstem tributary can be found throughout the site [M-NCPPC, 2007]), providing just enough fertility to sustain a density of trees to survive – if not necessarily thrive (M-NCPPC, 2001). However, it is likely that few of the current tree specimens are older than forty years. I spoke with Guy Semmes, a lifelong Travilah resident who grew up on a property just outside the current LSBCP. According to Semmes, “I remember one period back when we had the gypsy moth. [The] park service in the county made this enormous mistake of trying to get rid of it by spraying everywhere. So, they came before this area was developed, which is probably up until about [1989], maybe even in the nineties. They sprayed it, and then they came back and sprayed it again. And it killed ninety percent of those old trees. And they just fell over. There's some that survived, and they're

Figure 2.09 Historic Community Sites



probably those that survived are very old, too” (personal communication, February 2, 2025).

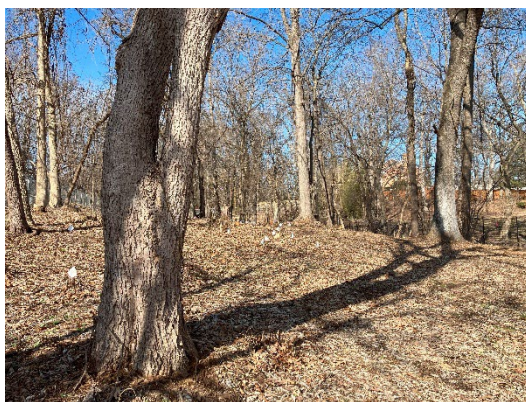
According to Semmes, the post-colonial settlement of the area significantly altered the landscape surrounding the Montgomery County serpentine barrens, transforming it into one dominated by tobacco farming (personal communication, February 2, 2025). In the late 19th century, a small settlement emerged, centered on the intersection of what are now Glen Road and Travilah Road (Maryland Historical Trust, 1975) (Figure 2.09). In 1883, this community received its first post office. The first postmaster to serve the post office was Travilah Clagett, a young disabled man in his late twenties. The community must have cherished Travilah Clagett. He died less than a year into his role as postmaster, and the community adopted his name as their own (Kelly, 2020). By 1903, Travilah is marked on the map near Darnestown (Rand McNally and Company, 1903).

In 1873, on the opposite side of the barrens, at the crossroads of what is now Glen Road and Piney Meetinghouse Road, another small enclave took root. This was The Pines, a small community of 15-20 homes belonging to formerly enslaved families and individuals (Clarke, 1983) (Figure 2.09). Residents of The Pines likely worked at the nearby Glen Mill and blacksmith shop (Buglass, 2024), but they may also have been farmers, sawmill workers, and quarrymen at the old Seneca Stone Quarry located eight miles away (Clarke, 1983). (The Holcim Mid-Atlantic Travilah Quarry did not begin operations until 1955 [Department of Environmental Protection, n.d.]) The Pines was first established when Nelson Cooper Sr., Aaron Turner, and Thomas Jenkins purchased a property called the Piney Thicket and subsequently built the Union Wesley Methodist Church (sometimes referred to as the Wesley Union Methodist Church) (Crawford, 2024). The church was a simple log structure that served as a church, school, and community meetinghouse, giving its name to Piney Meetinghouse Road (Buglass, 2024; Kelly, 2023). It was later replaced with a sturdier structure (Clarke, 1983), but by 1920, lack of participation from churchgoers forced the church to close its doors for good (Crawford, 2024). No evidence of the church building remains.

Thankfully, and against the odds, the church cemetery does remain. The Union Wesley Methodist Church cemetery contains the final resting places of over one hundred formerly enslaved people, freed Blacks, and their descendants. A change in Montgomery County tax policy in the early 1970s turned the property into taxable land. The family was never notified, and in 1975, the county sold the cemetery property at a tax auction (Crawford, 2024). Pennsylvania developer Saul Joseph

purchased the land sight unseen, intending to build a house for himself on it. Neither he nor the county realized the site held a cemetery at the time, and it was not until four years later that Joseph visited to begin construction (Kelly, 2023; Crawford, 2024). Joseph quickly discovered that there were actual gravestones beneath the overgrown vines and dumped trash, prompting him to immediately cease all construction activity (Clarke, 1983). He passed the property to his son upon his passing, who began researching the cemetery's history. Meanwhile, community members and descendants of those buried within the cemetery actively worked for years to urge Montgomery County to formally recognize and invest in restoring the

Figure 2.10 Top: Restoration Union Wesley Methodist Church Cemetery. **Bottom:** White flags mark burial locations

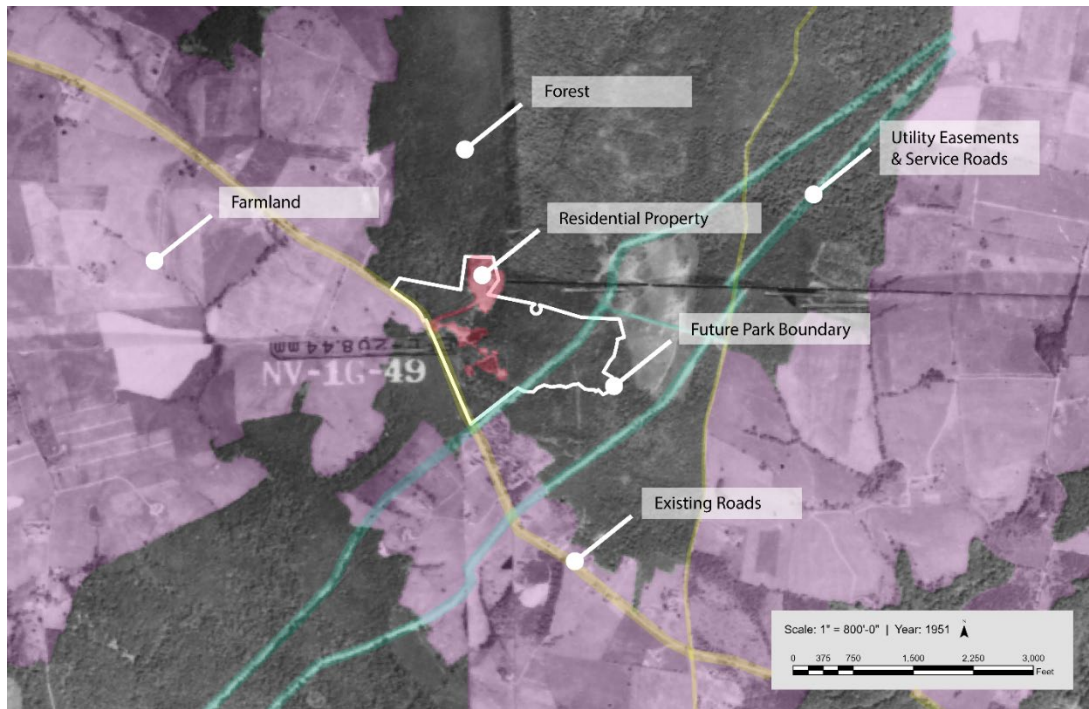


historic site (Flack & Knier, 2023).

Intense advocacy and organizing efforts led by Cherisse Crawford, a descendant of one of the cemetery residents, have finally resulted in county investment, as well as volunteer teams and donated fencing to help clear the site and mark grave locations (Figure 2.10).

Meanwhile, the entire Travilah area experienced rapid changes throughout the second half of the twentieth century and into the twenty-first. Semmes explained that by the Great Depression, poor agricultural land

Figure 2.11 Travilah/North Potomac, 1951



management and soil nutrient depletion from intensive tobacco farming had collapsed the local economy. The land began to sell for extremely low prices (personal communication, February 2, 2025). After World War II, Travilah saw a boom in land purchases by wealthy Washingtonians (Figure 2.11). As he explained, “I call it lawyer ghetto, [they] all came out and bought. Whether they lived there or not, they just bought a property” (personal communication, February 2, 2025). During this time, the Tipton and Weihe families purchased properties on what is now the LSBCP (personal communication, February 2, 2025) (Figure 2.12). The Tipton property comprised the majority of the current-day LSBCP acreage. The Tiptons quickly built a series of structures on their property, including a guest house, a pond house, a pond with a sophisticated overflow system, and a community parking area with public access directly from Glen Road (Figure 2.13). Their brick house (Perez-Rivas, 2001),

which Mrs. Tipton valiantly decorated with flower garden beds despite the poor soil, sat slightly apart from the pond area in a woodland triangle that included a second guest house and a barn. Later, the Tipton parents added an additional home to their residential triangle for one of their daughters (Guy Semmes, personal communication, February 2, 2025).

Figure 2.12 Piney Grove, Tipton, Weihe, and Semme properties
Source: M-NCPPC, 2001a, p. 83

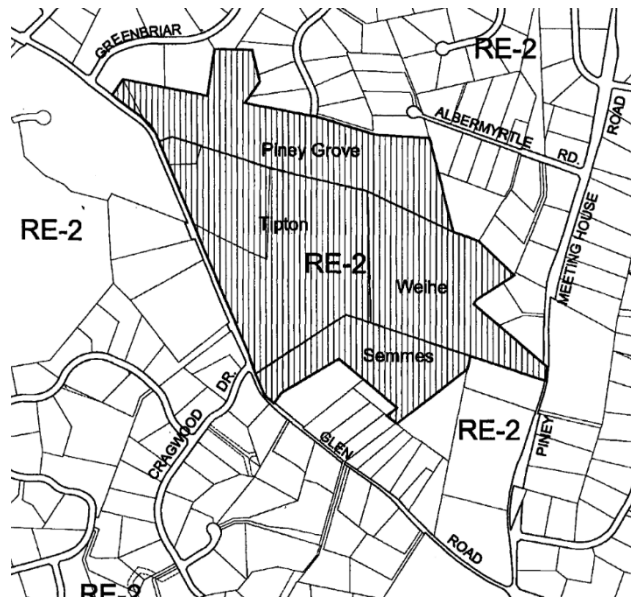
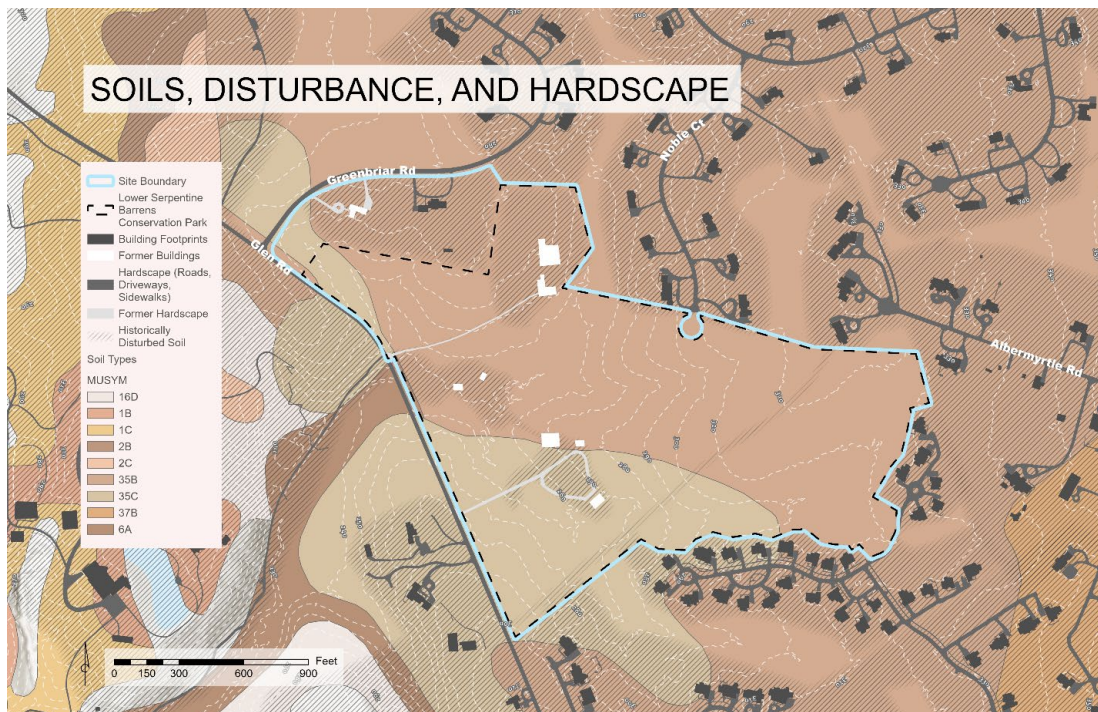


Figure 2.13 The site sits on two types of serpentine soil, 35B “Chrome and Conowingo soils” and 35C “Chrome silt loam”, soils found only on ultramafic, upland, serpentine barrens complex ecological sites (Natural Resources Conservation Service, n.d.) Numerous buildings and driveways used to exist within the site. Note that the former driveways within the LSBP boundary may have been unpaved.



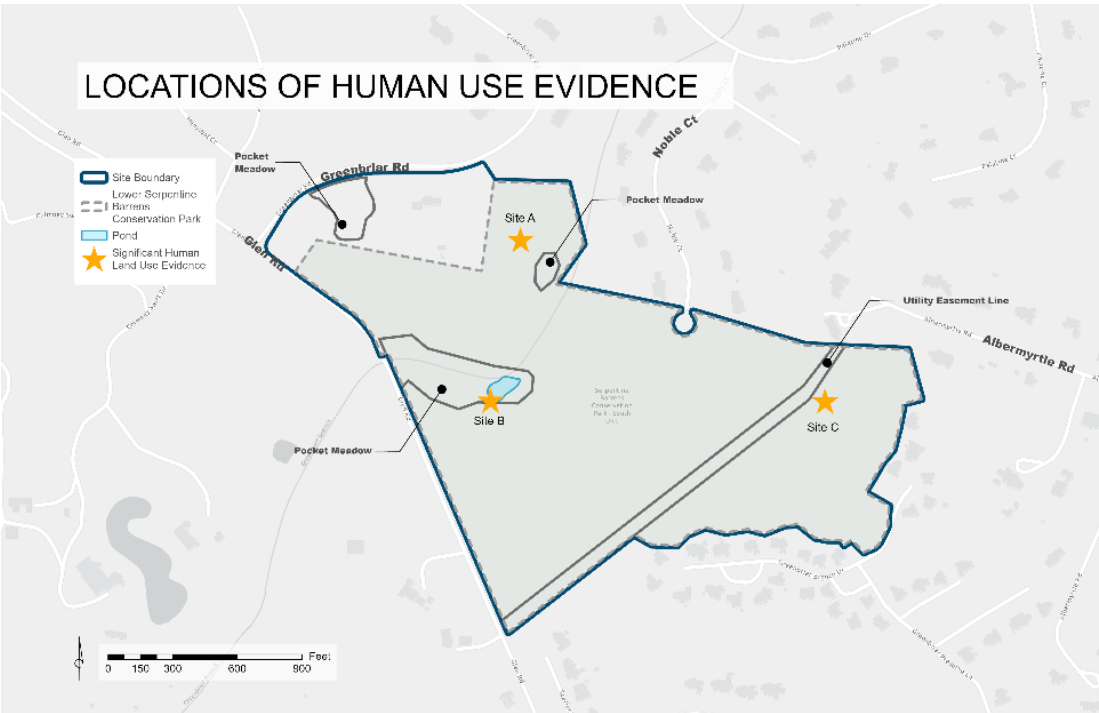
The Tipton Pond became a beloved gathering place for the community. Many who grew up in the area fondly remember swimming through the cattails in summer and ice skating there in winter (Blair, 2015). Semmes recalled, “You could skate way back. It was magical because not just in the pond, but you could skate way up into the woods between the trees” (personal communication, February 2, 2025). The Tiptons maintained a lawn in the open area between the pond, the pond house, and the driveway. According to Semmes, the pond house was a barn; the Tiptons rented half of it as an additional guesthouse, while the other half contained changing rooms open for public use (personal communication, February 2, 2025).

After a storm nearly washed away the original berm, Mr. Tipton installed a concrete overflow that allowed stormwaters to spill into a culvert and be redirected back into the stream further downstream to prevent tearouts and reduce erosion. Mr. Tipton also built a concrete pad at the pond's edge, featuring a gully for the stream to navigate around it if necessary (Semmes, personal communication, February 2, 2025). Remnants of these structures remain on the site today, along with architectural and household refuse located nearby along the stream (Figure 2.14).

The Tiptons also took great care in the maintenance of their forest. Semmes recalled,

They always tried to maintain those trees. And, you know, it was very hard because that soil. I mean, a tree with a six-inch caliber could be a hundred years old. [...] They thinned them out. Only the good healthy big ones grew. And it was really a beautiful property, but that was

Figure 2.14: Top: Remnants of Tipton, Weihe, and Informal Property **Bottom:** Evidence of Pond Drainage and Levees



Site B



Possibly old pond overflow system



Remains of platform possibly part of old pond dam



Household trash midden at creek edge

such terrible stuff to work with. [...] And, you know, [Mr. Tipton] never really had much of a lawn, but he was always cutting under the

trees. He had grass to grow under the trees, and he had grass around the pond. (Personal communication, February 2, 2025)

When reflecting on the beauty of the serpentine forest, Semmes remarked, “It was sort of a place where you went by yourself and just, you know, be away” (Personal communication, February 2, 2025).

A long driveway cutting through the Tipton property to the Piney Grove property provided

Figure 2.15: Closeup of Tipton driveway and buildings



access to two buildings, likely a house and a barn (Figure 2.15). According to Semmes, these were shack-type buildings inhabited by a family that likely neither owned nor rented the land. Even as wealthy families moved into the area, many long-time Travilah residents lived in deep poverty (Semmes, personal communication, February 2, 2025). Aerial photography suggests that by 1988, the Piney Grove residence may have been removed, although pixilation makes it challenging to determine for certain (Figure 2.16). Today, all that remains from the property is a line of utility poles and a cluster of fence poles tucked within the forest cover (Figure 2.17).

Semmes could not determine the exact location of the Weihe house, though it likely stood somewhere near Albermyrtle Rd. During one of my site visits, I

discovered a dump site in this general area that contained the remains of what may have been a 1960s Chevrolet or Ford pick-up truck, a pile of bricks, the spring and

Figure 2.16 Travilah, 1988: changes since 1951

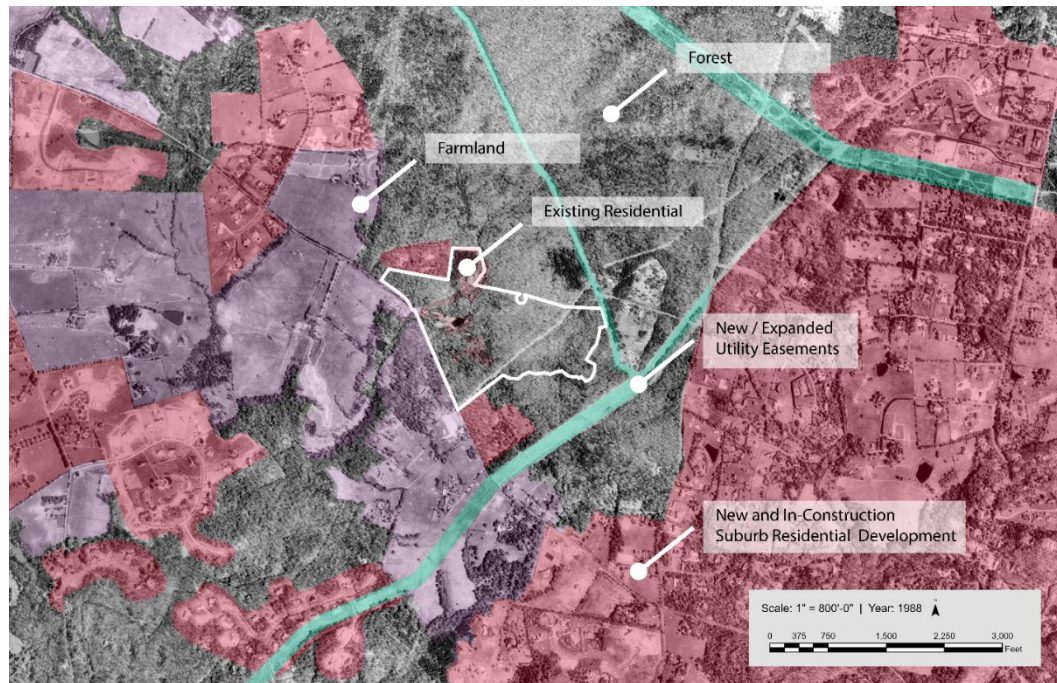


Figure 2.17: Evidence of the informal residence

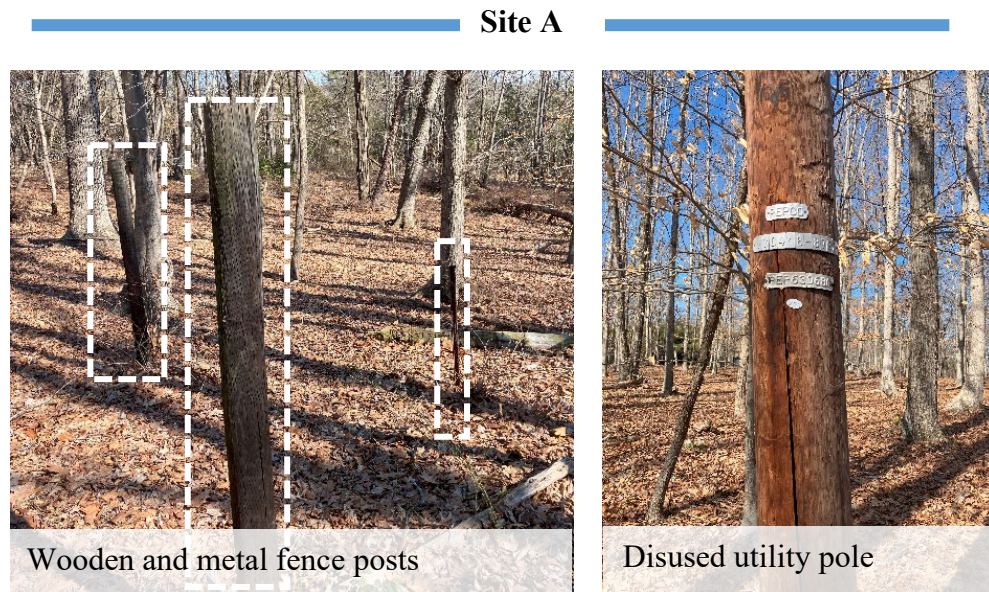


Figure 2.18: Weihe Property Evidence

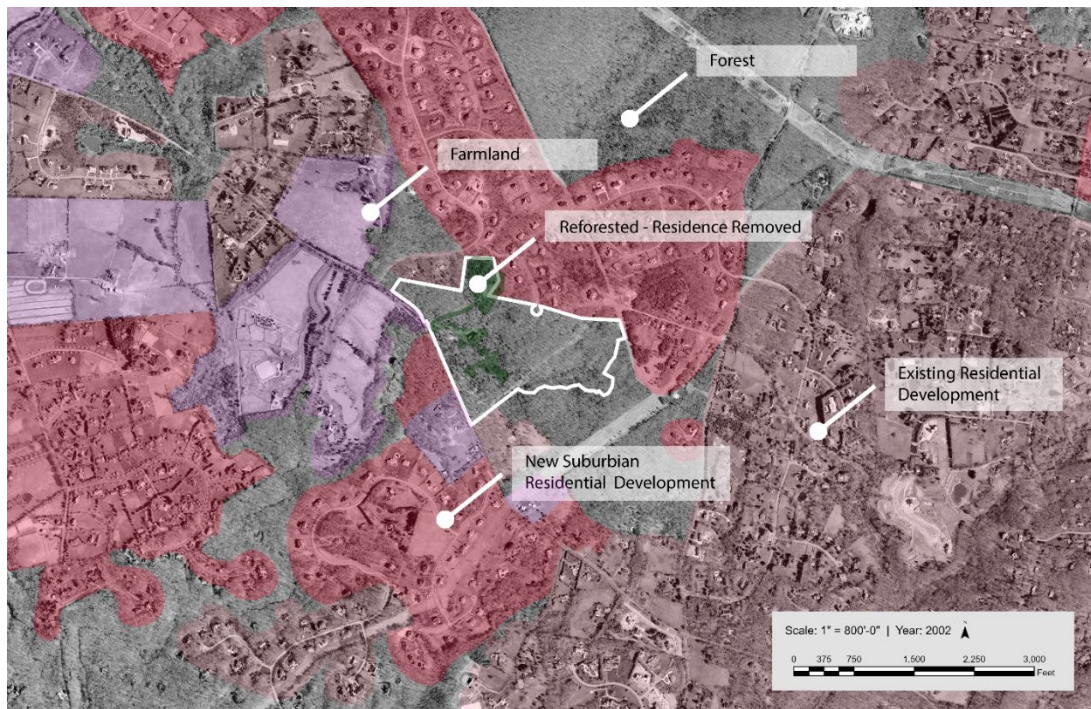
Site C



wireframe of a mattress, and an old wooden front door (Figure 2.18). These items were probably left on the site following the demolition of the Weihe house.

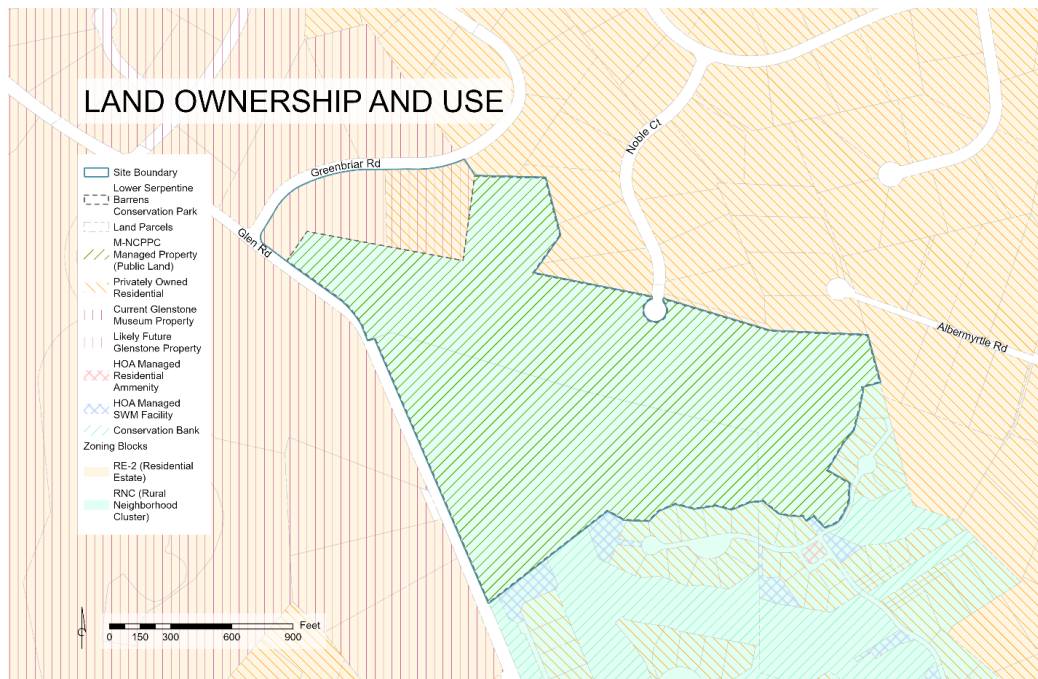
The influx of wealth in the 1950s transformed Travilah from a tobacco farming region into a horse community, but by the 1980s, the cultural landscape was once again in flux. By 1988, a steady stream of residential development had replaced the majority of agricultural land (Figure 2.16). In the early 1990s, development made its initial incursion into the fragile serpentine barrens forest (Figure 2.19). The Palatine project blasted through bedrock to connect the new homes on two-acre lots to sewer lines and significantly graded the thin soils (DeFord, 1999), depositing a

Figure 2.19 Travilah, 2002: changes since 1988



considerable amount of silt into the Greenbriar branch and marking the beginning of the end for Tipton Pond (Straszheim, 2015). This development also tipped the scales in favor of the surrounding forest, whose trees were already experiencing the stress of poor and shallow soils. By the decade's end, many trees displayed visible signs of stress, including a number that had died or were dying (DeFord, 1999). Montgomery County officials, aiming to preserve what remained of the Travilah Serpentine Barrens ecosystem, identified the Piney Grove, Tipton, Weihe, and nearby Semmes properties as the highest priority acquisitions to be designated as protected open space in their 2001 Legacy Open Space Functional Master Plan (M-NCPPC, 2001b). Over time, tensions arose between the county and the property owners, who were distrustful of the County's timeline and its ability to purchase the properties at a fair price, claiming the right to sell their land to developers who could pay immediately.

Figure 2.20 Land ownership and land use map, present day. Notice the residential zoning surrounds the park.



This dynamic threatened the effectiveness of Legacy Open Space conservation efforts (Perez-Rivas, 2001). After weeks of testimony and fact-finding, the Potomac City Council and the Montgomery County Planning Committee reached a compromise. Instead of acquiring the properties for the Legacy Open Space program, Montgomery County would rezone the land to Residential Neighborhood Cluster (RNC) zoning, which in 2001 required that between 65 and 85 percent of the site be established as open space in exchange for cluster development on the remaining portion of the site (M-NCPPC, 2001a). The final development plan for the site preserved the Tipton, Piney Grove, and part of the Weihe properties as conserved open space while leaving the remaining Weihe and Semmes properties to be developed into half-acre to two-acre lots (M-NCPPC, 2003) (Figure 2.19 - 2.20). Upon the final sale of the properties, the Tipton, Weihe, and Semmes families managed the demolition of all residential

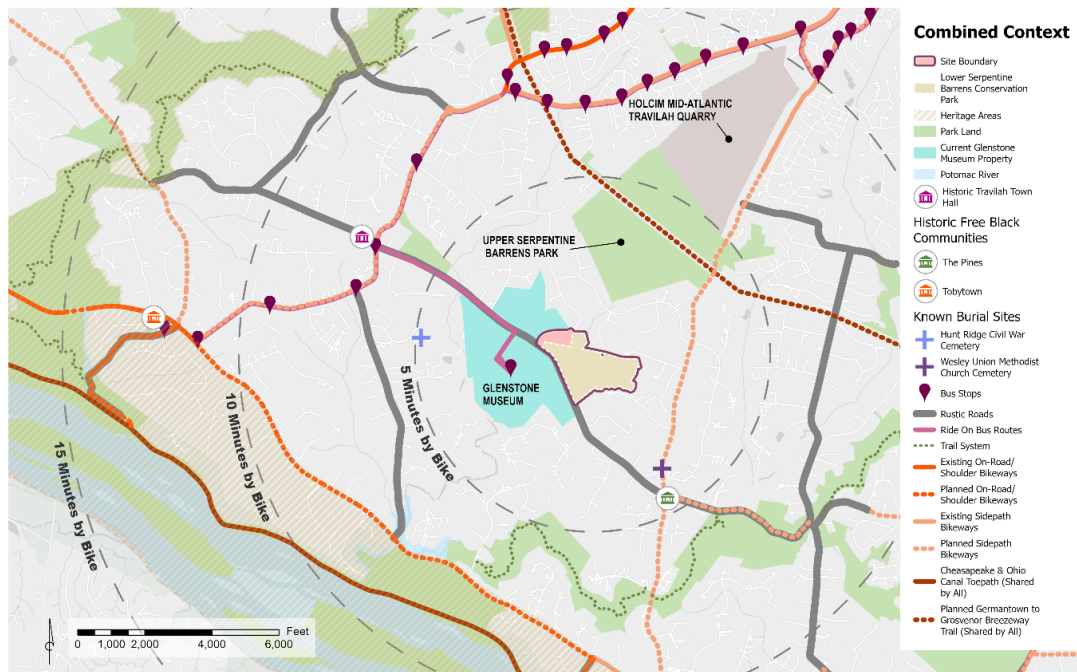
and barn structures on the site. The Tipton family also dismantled the berms around Tipton Pond, reverting the water body back to a stream. The Travilah serpentine barrens area officially gained conservation area park status in 2005 with the Montgomery County Planning Board's approval of the Serpentine Barrens Conservation Park Trails and Public Access Plan (M-NCPPC, 2007). Later published in the same year, the 2005 Land Preservation, Parks and Recreation Plan clarified Montgomery County's development strategy for conservation area parks, stating,

[Conservation area parks] provide stewardship of sensitive areas, but may [also] include trails and other low impact recreation areas when carefully designed to avoid, minimize, and/or mitigate environmental impacts. [...] Given the sensitive nature of the resources in conservation parks, development is very limited and generally restricted to passive recreation areas and opportunities such as trails, fishing and picnic areas, and nature study. Opportunities for interpretation of the protected environmental, historic, and archeological elements should be maximized through self-guided nature trails, interpretive signage, and naturalist programs. (p. III-11 – III-12, M-NCPPC, 2005a)

This language is followed in all subsequent reports about the site, including the Serpentine Barrens Conservation Park Operations & Use Plan published in 2007. It continues to guide M-NCPPC's current strategy for the LSBCP.

In 1986, American billionaire Mitchell Rales purchased 230 acres along Glen Road, opposite the serpentine barrens site (Chow & Yan Zhang, 2018). From 1931 to

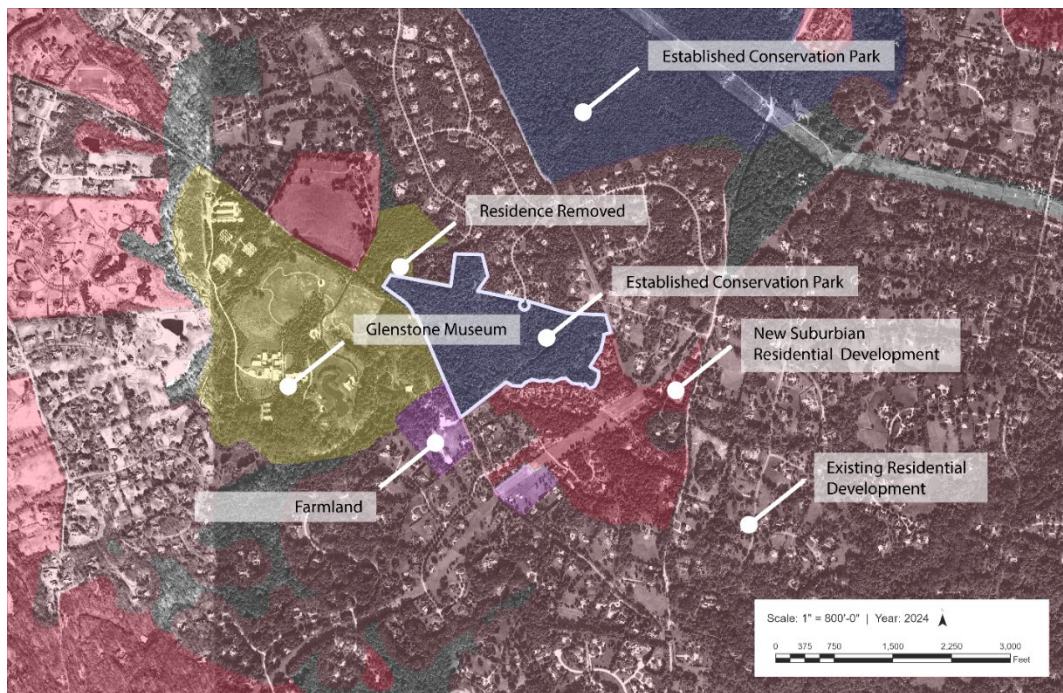
Figure 2.21: Present Day Combined Regional Context, Circulation, and History



1980, the estate served as the grounds for the Potomac Hunt Club, the beating heart of Travilah’s equestrian culture, until development pressures ultimately forced its relocation to Barnesville (Glenstone Museum, 2018). A near-death experience in 1998 convinced Rales to create a legacy by transforming his home into the Glenstone Museum, a venue for sharing his collection of post-war contemporary art with the public. He imagined the museum would be “a tranquil place where, when you came through the gates, you forgot about whatever burdens you were carrying” (Lipsky-Karas, 2017). Glenstone Museum officially opened in 2006, but it soon became embroiled in controversy and criticism over its limited public access and lending practices, leading some to question the legality of its tax-exempt status (Pogrebin, 2018). In response, Rales and his wife, Wei Rales, a former curator and dealer, embarked on a \$200 million, 230-acre expansion for the museum (Figure 2.21), which added visitor parking, a new visitor center, additional gallery space, and a

rolling landscape of restored native meadow (Mendelsohn, 2018). These changes also signaled a new era for Glenstone, introducing new strategic priorities in ecological restoration and preserving the rural character by purchasing newer “McMansion” developments and restoring them to natural habitat. By 2024, Glenstone had expanded across Glen Road to include the properties on both sides of Greenbriar Road, where it intersects with Glen Road (Figure 2.22).

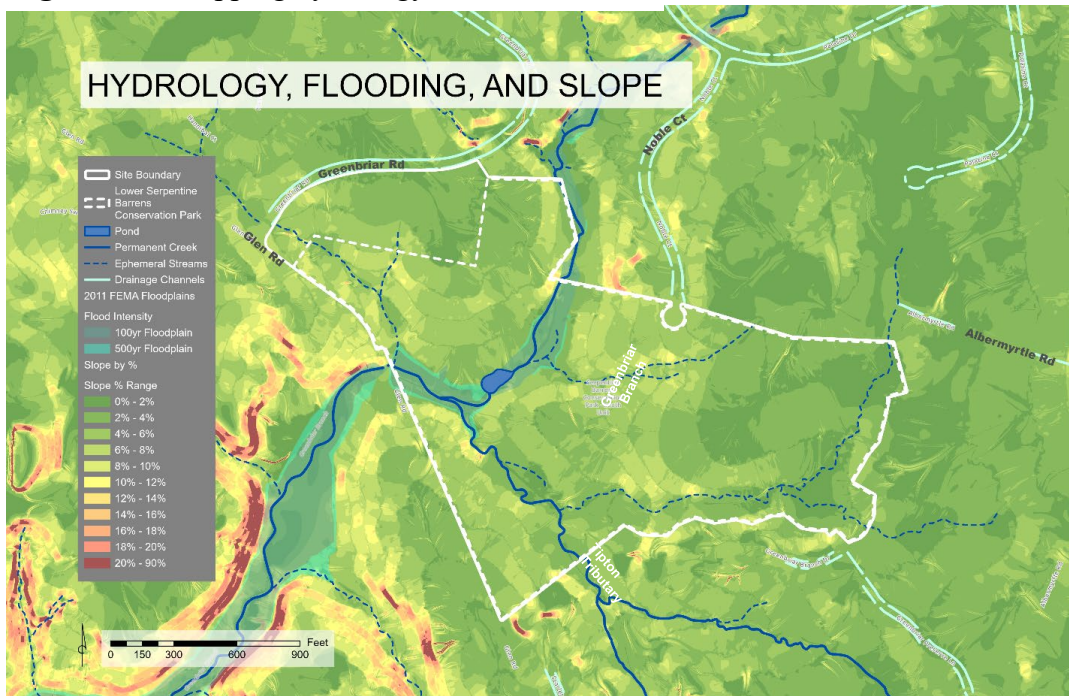
Figure 2.22 Travilah 2024: Changes since 2002



Abiotic and Biotic Site Conditions

The study site contributes to the Greenbriar Branch sub-watershed within the Watts Branch watershed. The Greenbriar Branch stream flows north to south through the center of the site, passing through the Tipton Pond basin along the way (Figure 2.23). The stream traces the outer edge of the pond basin. From the southern end, it seems as though the stream has forked upstream, forming a silty island at the center

Figure 2.23 Mapping hydrology



of the former pond. However, the right-hand (eastern) rivulet appears to be fed by groundwater, as it does not reconnect with the primary stream at the northern end of the basin. The steep walls of the former pond remain evident along the edges of the basin. They make it challenging to view the stream up close and give the area an overall ambiguous identity.

A second perennial stream, often referred to in M-NCPPC documents as the Tipton Tributary, flows westward through the Estates development into the conservation park, where it joins the Greenbriar Branch south of the pond basin. A network of intermittent streams channels rainfall across the site into the Greenbriar Branch. While the entire design site is relatively flat, the diverging streambeds create a series of gentle undulations in the topography. The site's eastern and western sides slope toward the Greenbriar Branch at the center. Slopes are generally less than eight percent (8%), though in some areas they can reach as steep as twelve percent (12%).

Fortunately, neither the 100-year nor the 500-year flood zones extend far from the banks of the Greenbriar Branch, likely because this area is relatively upstream within the watershed.

South of the Glenstone Museum, the Greenbriar Branch joins the Sandy Branch, which then merges into the Watts Branch at River Road. A third of a mile later, Watts Branch flows into the Potomac River. Less than three miles of waterway stretch between the southern border of the LSBCP and the Potomac. The quarry to the north disconnects the Greenbriar Branch from its source; however, the water collected from within the Upper Serpentine Barrens Conservation Park flows through the Palatine development and into the LSBCP. Numerous stormwater management facilities within the Estates development prevent runoff from eroding the Tipton tributary's banks.

Due to the difficulty of implementing an underground stormwater sewer system through shallow serpentine soils, many roads in the area have been outfitted with channels on either side to direct runoff (Figure 2.24). These channels typically

Figure 2.24 Stormwater channel with bridge from previous residential driveway



end at an overflow drain, which I assume spills into the nearest branch, although I could not confirm this. This poses a minor logistical challenge for the Greenbriar Road trailhead site, as access to parking on the site requires a bridge over the channel.

East of the Greenbriar Branch, the site features patches of Aldino silt loam soils, which are siltier compared to the surrounding Chrome and Conowingo soils (unmapped due to imprecise location data). These patches, found on slopes ranging from three to eight percent, sit above a subsoil fragipan (a subsurface soil layer that restricts water flow and root penetration) that limits infiltration and leads to saturated soils for extended periods following rain events (M-NCPPC). I observed this effect during my February site visit, which occurred about a week after snowfall when temperatures had just warmed enough to melt the snow. Throughout the PEPCO right of way, wherever the topography flattened, I discovered pooling water and saturated soil (Figure 2.25). Interestingly, the pooling did not extend into the forest on either side, even if the slope remained the same, likely due to water absorption by the trees. During this visit, I attempted to confirm my suspicion that the Tipton Pond meadow was a periodic wetland meadow. While I did not find large areas of saturated soil, I noted that the

Figure 2.25 Snowmelt pools on flat areas of the PEPCO right of way



Figure 2.26 Water from an intermittent stream sheet across the Tipton Pond meadow before reaching Greenbriar Branch



ephemeral stream flowing towards Greenbriar Branch from the park's west end transformed into a surface sheet flow upon entering the meadow (Figure 2.26). I encountered several smaller sheet flow 'streams' scattered throughout the meadow, some of which did not connect to a source on the uphill woodland edge. Based on this evidence, I classify the Tipton meadow as a periodic wetland. I also found additional indications that at least some of the woodland areas, particularly along the stream banks just upstream of the pond basin, may also be periodic wetlands. During my February visit, broad clusters of Skunk Cabbage (*Symplocarpus foetidus*) were beginning to emerge.

The high erodibility of serpentine soils and the impact of the Palatine development on peak flow rates may cause the Greenbriar Branch to contribute a higher-than-normal amount of suspended particulates to the Watts Branch watershed. However, further tests need to be conducted to confirm this. There is substantial evidence of bank erosion along each of the perennial and intermittent streams (Figure 2.27). The Greenbriar Branch experiences the worst erosion, particularly just upstream and at the base of the pond basin (Figure 2.28). Given these conditions, I believe any new development within the trailhead area and conservation park should incorporate stormwater best management practices (BMPs). This includes consideration of the trails. M-NCPPC has already determined to implement only natural surface trails within the park to minimize the disturbance caused by paving strategies (Christie Ciabotti, personal communication, April 25, 2024). Careful measures must be taken to ensure these trails do not lead to accelerated erosion patterns.

Figure 2.27: Intermittent creak showing signs of erosion

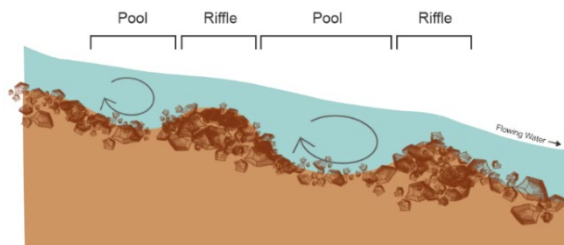


Figure 2.28: Heavily eroded bank where Greenbriar Branch exits the pond basin. Bank cliff is approximately five feet tall.



Greenbriar Branch could also benefit from wetland or stream restoration interventions, such as installing riffle-pool sequences (Figure 2.29) at strategic locations along the stream. This approach would help slow flow speeds while creating traps for suspended sediment. The pond basin might also serve as a valuable resource. Partial reconstruction of the Tipton Pond using stream restoration techniques would not only help protect the failing banks, but also add significant recreational value to the park.

Figure 2.29 Riffle-pool sequences help to capture sediment loads, slow overall flow speeds, and create vital aquatic habitats



Another factor likely contributing to erosion rates is the sparse vegetation within the forested area. Serpentine soils are ultramafic, meaning they contain high levels of iron and magnesium. Magnesium is toxic to plants because it inhibits their ability to absorb essential nutrients like calcium, which are already deficient in

serpentine soils (M-NCPPC, 2007). These soils also tend to be well-draining and shallow, with a maximum depth of five feet before hitting bedrock (Natural Resources Conservation Service, n.d.), limiting their water holding capacity. The drier conditions compound the stress on plants due to high magnesium levels and other heavy metals. Additionally, while surface levels of the soils may be more acidic, erosion can easily strip these layers down to the more alkaline sublayers (M-NCPPC, 2007). The oak canopy filtering sunlight from reaching the forest floor adds a final blow; as a result, these forests are noticeably free of understory brush. Although the soil conditions significantly impact the trees, this effect is not immediately obvious. Trees growing on ultramafic serpentine soils experience stunted growth, resulting in a “somewhat miniaturized forest effect” (M-NCPPC, 2005c) (Figure 2.30). Smaller trees and a sparse understory mean fewer roots to stabilize the soil. This effect is especially evident when comparing the wooded areas of the Tipton tributary with the section

Figure 2.30

Top: “A 45 year old stunted oak tree stump” Source: M-NCPPC, 2005c, p. 20

Bottom: Comparison of the effect of serpentine soils on tree caliper vs. typical conditions

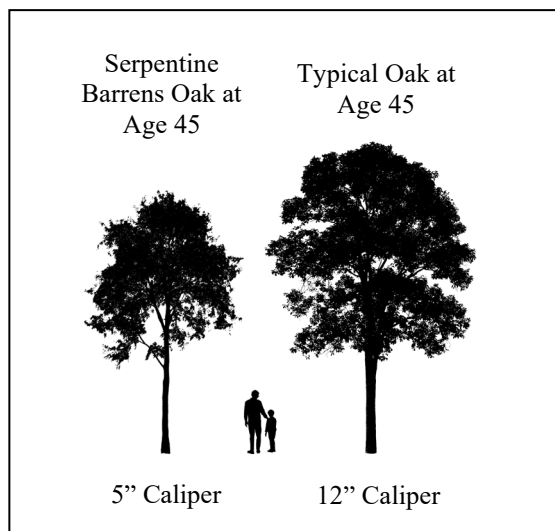


Figure 2.31

Top: Tipton Tributary within forest

Bottom: Tipton Tributary cutting across PEPCO right of way



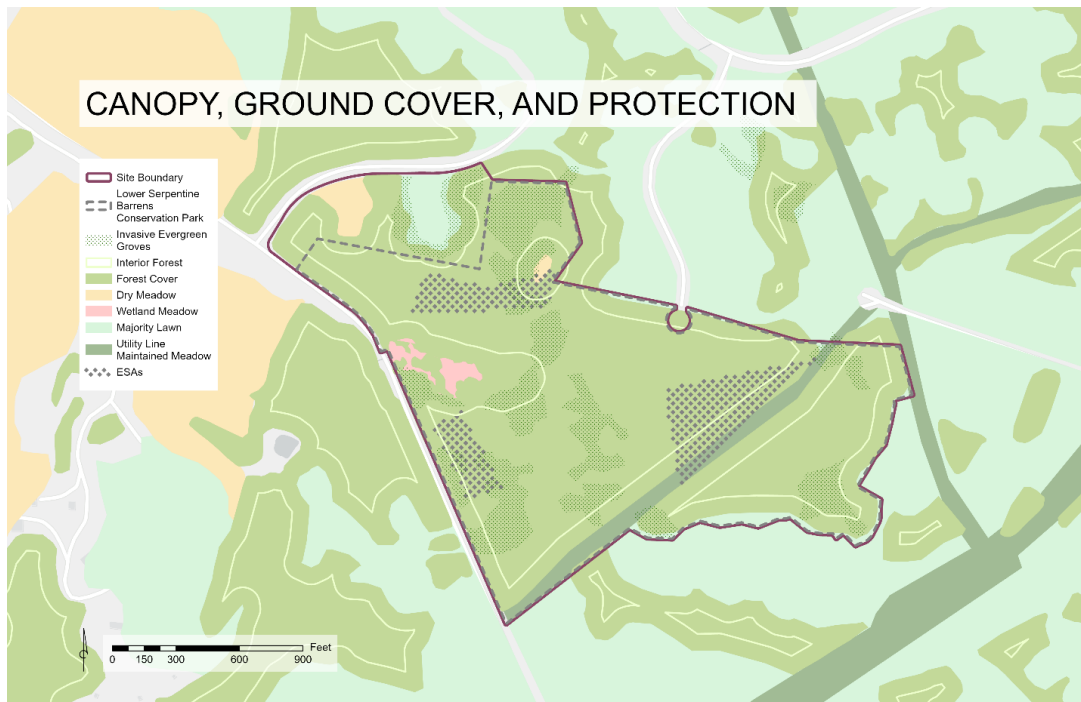
crossing the meadowed PEPCO right of way.

Many grassland species endemic to serpentine barrens have adapted extensive root systems to capture as much water as possible (M-NCPPC, 2007), thereby stabilizing the soils. Compared to the wide, shallow morphology of the forested section, indicating slow erosion of the forest soils, the meadow segment remains a narrow, deeper cut through the grasses (Figure 2.31).

This is likely to significantly affect the site's overall soil stability, as nearly the entire area is covered by forest (Figure 2.32). This forest patch, in combination with that of the Upper Serpentine Barrens Conservation Park, represents one of the most extensive contiguous forest tracts remaining in the

Potomac region (M-NCPPC, 2007). It consists predominantly of oak species, most notably an abundance of blackjack (*Quercus marilandica*) and post (*Quercus stellata*) oaks, which are rarely found elsewhere in Montgomery County, along with some hickory and chestnut species. Yellow pine (*Pinus echinata*), another county rarity, can also be found throughout the site.

Figure 2.32 Mapping biotic elements



Numerous copses of Eastern red juniper (*Juniperus virginiana*) and Virginia pine (*Pinus virginiana*) infiltrate the forest, two species native to Maryland that are considered invasive to serpentine barrens ecosystems (Ellis et al, 2022) (Figure 2.30). Areas where these copses border existing patches of meadow may present opportunities for clearing out invasive tree species and expanding or restoring the meadow environments (Ellis et al, 2022). However, any implementation of tree clearing should be weighed against the value of interior forest habitat. Although disconnected from the interior forest habitat of the upper unit of the conservation park, the LSBCP nevertheless contains a significantly large forest stand, which in turn supports a substantial area of interior forest habitat. Numerous animals depend on these habitats for breeding, particularly bird species such as the Louisiana waterthrush, scarlet tanager, ovenbird, pileated woodpecker, and barred owl (M-

NCPPC, 2007). As development continues throughout the Potomac region, fragmenting the remaining forest stands, these large contiguous tracts become increasingly essential to protect. In the long term, both interior forest habitats of the upper and lower units would benefit from a dedicated protected corridor linking the two together. As the smaller of the two, the lower park unit may, over time, require a corridor connection to the more extensive forest stand to support a healthy complex ecosystem, especially one that contains interior conditions to allow the exchange of interior-dwelling species across the two units (de Lima Filho et al, 2021). This can be achieved by acquiring select Palatine residential properties that separate the two units (Ellis et al, 2022). Currently, however, neither M-NCPPC nor Glenstone intends to pursue unification of the conservation park units.

A good portion of the Lower Serpentine Barrens unit's subcanopy is characterized by loose, yet impenetrable thickets of thorny glaucous and round-leaf greenbrier (*Smilax glauca* and *Smilax rotundifolia*) (Figure 2.33). Greenbrier is another North American native considered invasive to serpentine barrens grasslands (McCandless, 1998), but typical of serpentine barrens forests (U.S. Geological Survey, n.d.). It is believed that greenbrier ameliorates nutrient-deficient serpentine soils through nitrogen enrichment (McCandless, 1998), potentially providing critical support to

Figure 2.33 Close-up of greenbrier stem



Figure 2.34 Carpeted stiltgrass at the pond basin



the oak forest. The greenbrier thickets can sometimes conceal the presence of a similarly thorny invader. Invasive Japanese barberry (*Berberis thunbergii*), known for promoting deer tick populations and outcompeting native species, as well as multiflora rose (*Rosa multiflora*), grow abundantly in the area.

Stiltgrass (*Microstegium vimineum*) had already been marked as a growing problem in 2005 (M-NCPPC, 2005b) and now completely carpets vast areas of the park, including both woodland and meadow environments, and within the pond basin (Figure 2.34). Deer populations continue to pose a growing issue in the Potomac region and can be incredibly destructive to vulnerable serpentine barrens habitats (Smeader, 2023). During all three of my site visits, I either observed deer within the park or found evidence of bone and antlers. Overgrazing presents a serious risk to the Serpentine Barrens Conservation Park ecosystem, with over twenty species of rare, threatened, endangered, and watchlist (RTEW) plants for the state of Maryland observed across the upper and lower units. Of this list, at least five species, including *Gentiana villosa*, *Gentianopsis crinita*, *Melica mutica*, *Stenathium gramineum*, and *Symphyotrichum depauperatum*, are critically endangered in the state (Natureserve.org). I especially adore the *Gentianopsis crinita*, or greater fringed gentian (Figure 2.35). This small biennial wildflower thrives in the wetter areas of serpentine barrens. In autumn, after all the other wildflowers have faded, it showcases

bright blue and festively fringed blooms. M-NCPPC has identified three environmentally sensitive areas (ESAs) within the lower park unit where endangered species were observed (Figure 2.36). Land management will also be critical in protecting these species. Through years of research, conservation biologist and environmental planner Roger Latham identified a management routine that appears to yield desirable

barrens conditions. This routine includes prescribed fire, deer exclusion, and population augmentation (Smeader, 2023). Notably, M-NCPPC has recently reversed its 2007 stance against using fire management strategies at the Serpentine Barrens Conservation Park. The commission recently announced that this Spring it will conduct prescribed fires at two locations, including at the Serpentine Barrens

Figure 2.36 Sensitive Areas (outlined in white)



Figure 2.35 Greater fringed gentian in bloom. (*Gentianopsis crinita* (greater fringed-gentian) by [Doug McGrady](#). Licensed under [CC by 2.0](#))



Conservation Park (M-NCPPC, 2025).

Many plant species endemic to or characteristic of serpentine barrens grasslands have been observed in the LSBCP meadow areas, including little bluestem

(*Andropogon scoparius*), Indian grass
 (*Sorghastrum nutans*), purple milkweed
 (*Asclepias purpurascens*), and potato dandelion
 (*Krigia dandelion*). This observation holds true
 despite the fact that all the meadow patches are
 situated on soil that has been disturbed
 previously and, in some cases, recently.

Several animals make the LSBCP their
 home. Using the Merlin phone app, I identified
 the calls of eastern bluebirds, white-crowned
 sparrows, white-throated sparrows, goldfinches,
 tufted titmice, red-bellied woodpeckers, hairy
 woodpeckers, and red-shouldered hawks during
 my site visits. I also encountered a box turtle
 and (most of) an eastern Hercules beetle

Figure 2.37

Top: Headless Hercules
 beetle found on site

Bottom: Eastern Hercules
 Beetles in Baltimore Co.,
 Maryland (8/1/2020) by [Pat
 Treece](#). Licensed under [CC
 BY-NC 4.0](#)



Figure 2.38: Eastern Hognose Snake,
Heterodon platirhinos by [Patrick Randall](#).
 Licensed under [CC BY-NC-SA 2.0](#)



Figure 2.39 Five-striped Blue-tailed
 Skink (*Plestiodon elegans*)

藍尾石龍子 by [Thomas Brown](#). Licensed
 under [CC BY-NC-SA 2.0](#)

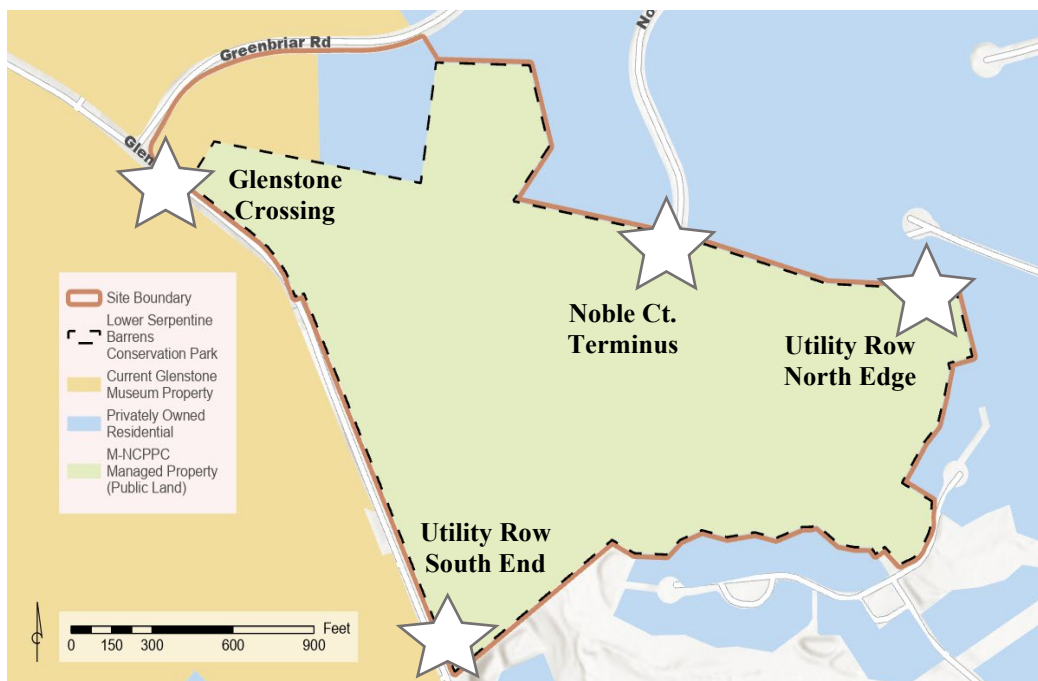


(Figure 2.37). The only snake species I saw explicitly mentioned is the eastern hognose (Figure 2.38), although other species common to the area likely also reside there (M-NCPPC, 2007). The site also supports a personal favorite lizard species, the five-lined or blue-tailed skink (Figure 2.39). The streams, wetlands, and vernal pools throughout the conservation park support a variety of amphibians, including spotted salamanders, marbled salamanders, wood frogs, and spring peepers (M-NCPPC, 2007).

Entry Points

In addition to entry from the Glenstone property, there are three possible access points to the park: at the terminus of Noble Ct. and at both ends of the utility row (Figure 2.40). All have the potential to serve as entrances for residents of the surrounding community, and if not taken into account, may lead to unplanned and unwanted desire paths.

Figure 2.40: Alternative access points



The Noble Ct. entrance provides the most direct access (see Figure 2.41). The road ends in a truncated cul-de-sac that could easily be transformed into a formalized trailhead area. Notably, the right-of-way for a complete cul-de-sac still exists,

as indicated by the unusual divot along the park boundary. With cooperation from the County and State, however, this right-of-way may still serve as a trailhead area.

The utility row termini present more significant challenges. At the north terminus, the actual route of the buried utility lines turns to run beneath a private property lot. The straight meadow gap, which had defined the utility line up to this point, branches. One branch follows the utilities onto the residential property, while the other continues in the original direction. This second path, upon reaching the park

Figure 2.41 Truncated cul-de-sac at Noble Ct. terminus



Figure 2.42 Abrupt northern end to utility row



boundary, meets a fence; another residential property stands between it and Albermyrtle Rd. (see Figure 2.42). Nowhere does this end meet the right-of-way directly. Access through this area would require crossing over private property.

Figure 2.43 Southern end of utility row immediately abuts Glen Rd. pavements



Figure 2.44 Possible access between detention basins



The southern terminus does connect to the right-of-way along Glen Rd. However, due to high traffic and the absence of sidewalks, shoulders, and clear areas on this side of the road, pedestrian access from Glen Rd. could present significant safety risks (see Figure 2.43). Alternatively, community members might seek access through the stormwater management area located just east of this section of the utility line (see Figure 2.44). This area is likely managed by the Estates at Greenbriar community HOA, and any formalized access path would require HOA approval.

Pedestrians arriving from Glenstone, whether as visitors to the Glenstone Museum or from the Glenstone bus stop, need to travel along and cross Glen Rd. to reach the Glenstone-owned trailhead property. On the south side of Glen Rd., the Glenstone Museum has maintained a stretch of meadow approximately forty-five feet wide between the road edge and the tall fence along the museum boundary. Since there is no similar space north

Figure 2.45 Location for pedestrian crossing and speed table



of Glen Road, this area could be utilized for a connecting pathway that crosses Glen Road at its intersection with Greenbriar Rd. (see Figure 2.45).

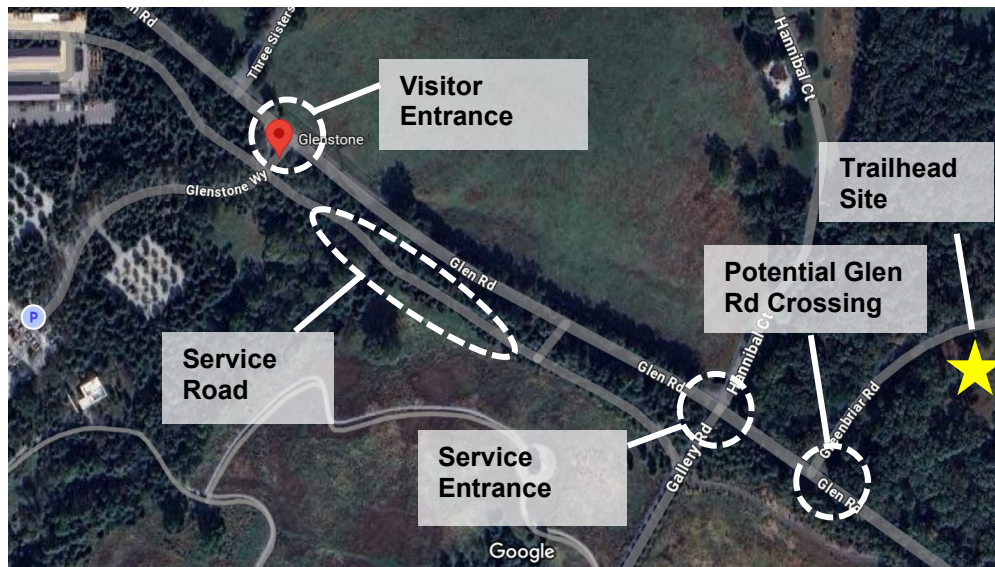
James Elliott cautioned that roadside pathways can be areas of intense discomfort for neurodivergent individuals. According to him,

You often need to provide options rather than a single solution. That can be difficult to do in the built environment where you have constrained space, but it's not impossible. Like, one of the things that we've found about people with Autism Spectrum Disorder is that they can be very sensitive to noises and proximity to traffic. So, path paths that are away from traffic can be helpful to people with Autism Spectrum Disorder. That doesn't mean that you couldn't have a path that is closer to the curb. You know? You might need that if there's a drop-off zone or whatever. (Personal communication, October 10, 2024).

As an alternative to a connecting pathway running alongside Glen Road, an existing service road within Glenstone Museum with access back to Glen Road via an existing service entrance may be adapted as a pedestrian route to the park (see Figure 2.46).

This pathway would be within the museum's border fence, providing visual and auditory screening from traffic. Measures would need to be put in place to keep this route from becoming a "back door" access to the museum. A short stretch of this connecting pathway would still run alongside Glen Road between the service entrance and the crosswalk, unless Glenstone implemented a new pedestrian exit through the fence at the crosswalk location.

Figure 2.46 Existing infrastructure that could potentially be used connecting path to park site separated from Glen Rd.

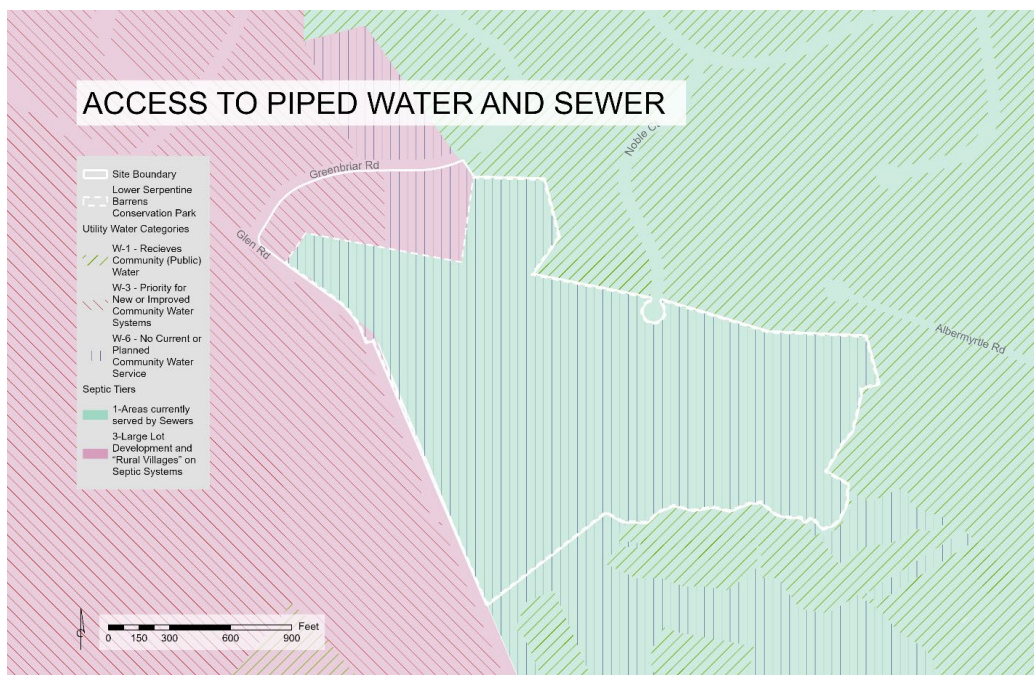


The crosswalk itself may present an accessibility challenge for some neurodivergent visitors. Elliott reported that several studies have examined the difficulties Autistic individuals and those with intellectual and developmental disabilities encounter at intersections. However, many of those studies focus more on training individuals in safe crosswalk behavior rather than on designing interventions that make these spaces easier and safer to navigate. Elliott suggested adhering to Vision Zero and Safe System design guidelines, which aim to enhance street safety based on the understanding that people will inevitably make mistakes. These measures primarily employ strategies to reduce driving speeds where roadways may intersect with pedestrian and cycling paths.

The Serpentine Barrens Conservation Park Operations & Use Plan (M-NCPPC, 2007) provides guidance on parking needs and locations for visitors arriving by car: “South Unit Parking will accommodate 20 spaces and allow for bus turnaround, in addition to supporting toilet and pavillion [sic] facilities” (p. 36). The

report states that a priority measure for the Serpentine Barrens Conservation Park would be to “Pursue construction of a permanent Pavilion for Educational Interpretation to be located in the South Unit within proximity of the farm pond and parking area” (p. 35). The Pavilion for Educational Interpretation is specified elsewhere as an open-air pavilion designed to provide a staging area for M-NCPPC Park Naturalists. It should be large enough to accommodate student groups and should feature significant educational signage (pg. 32). The report indicates that the quarry could serve as a potential source of both gravel for the parking area and specimen boulders for educational purposes. Because this report was published before Glenstone’s purchase of the adjacent property, it assumes an entrance location within the park property itself, with an entrance off Glen Road. The report specifies permanent chemical toilet facilities for the site, which may be upgraded to flush

Figure 2.47 Piped Water, Sewer Lines, and Septic Systems



toilets on the Glenstone property. The site receives community water service, although it would rely on a septic system for sewage (Figure 2.47). Flush bathrooms with running water would greatly enhance the usability of the facilities, especially for neurodivergent visitors who may be particularly sensitive to smells.

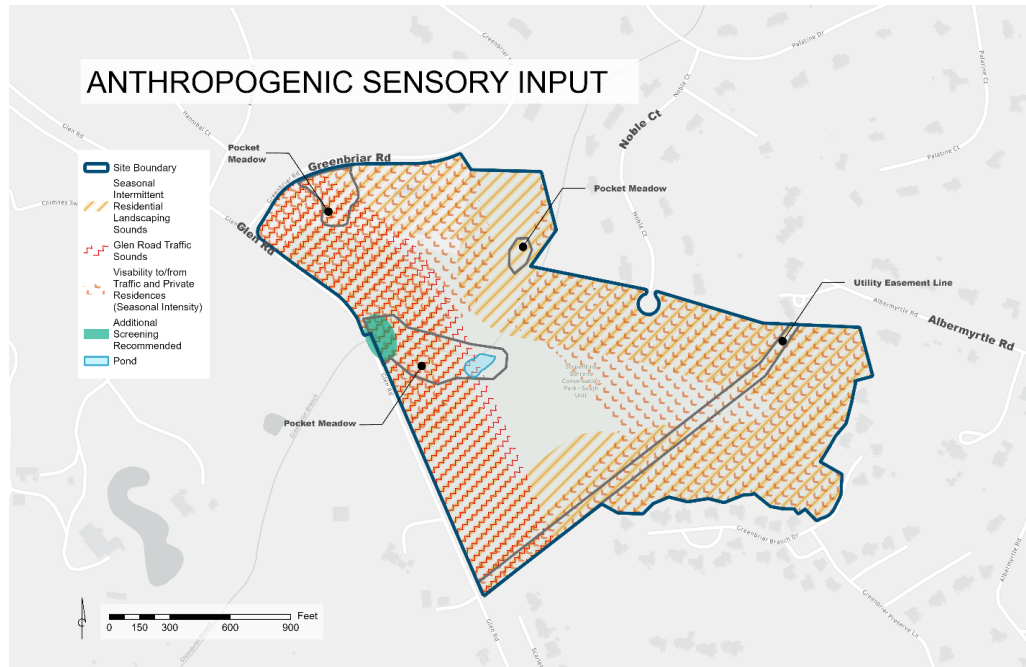
Sensory Mapping: Anthropogenic and Biogenic/Naturogenic Sensory Input

During site visits, I utilized photographs, video recordings, and written notes to document my experiences of anthropogenic (generated by human sources) and biogenic/naturogenic (generated from natural sources) sensory input throughout the site. This methodology was originally intended to implement a simplified version of Jensen's (2023) Designing Spectrums methodology, aiming to produce a modified version of his sensory heat mapping. However, due to time constraints, I instead adopted a similar approach to the sensory zoning proposed in Finnigan's (2023) Sensory Responsive Environments. Anthropogenic sensory input encompasses the sounds, smells, sights, tastes, and tactile materials produced or derived from human-made sources, such as traffic sounds. Biogenic sensory input pertains to the sounds, smells, sights, tastes, and tactile materials produced or derived from living organisms or biological processes. In this case, I use this term specifically to refer to non-human living organisms. An example of biogenic sensory input would be the sound of bird calls. Lastly, naturogenic sensory input encompasses the sounds, smells, sights, tastes, and tactile materials produced or derived from natural causes. I am using this term to specifically refer to natural non-biological factors, such as the movement of wind and water.

I focused primarily on sights, sounds, and textures (tactile materials) – both the type and intensity – for sensory mapping of the site. My personal observations from late summer, fall, and winter served as the foundation for this sensory mapping, though I did not utilize recording technology beyond photographic and video evidence captured on a smartphone. (Three of these videos were later used during the second part of the participatory research, the design workshop, to introduce participants to the different soundscapes across the site.) As a result, these maps are qualitative approximations, likely shaped by my personal experience of sensory processing and the conditions on the days of my visits. Many sensory inputs were specific to the seasons. In generating the sensory maps, I chose to generalize the presence and intensity of each type of sensory input throughout the seasons.

My findings from the literature review suggested that anthropogenic sensory input may cause more discomfort than naturogenic sensory input. Based on this information, I chose to map anthropogenic sensory input separately from biogenic/naturogenic input. Figure 2.48 shows the anthropogenic sensory landscape within the site. The map represents the extent to which traffic and landscape maintenance sounds (such as leaf blowers) and visibility of anthropogenic sources (namely private residential houses and passing traffic) extend into the site. Glen Road is a particularly noticeable source of noise. Unsurprisingly, I noticed the vehicle sounds much farther away during my winter visit than during my summer visit, but even with the forest fully leafed out, the sounds reached fairly deep into the conservation park. Additional screening along the road edge, especially at the mouth

Figure 2.48 Mapping anthropogenic sensory input and relief



of the pocket meadow that reaches Glen Road, may help to lessen the intensity and spread of these sounds.

During the summer and autumn months, in particular, the sounds of leaf blowers and lawnmowers from the nearby residential areas penetrate the site. In my experience, these sounds are quieter than the traffic noises from Glen Road and are more easily filtered by the foliage, which means they do not penetrate as far into the park. This creates an area in the heart of the eastern section of the conservation park where visitors can be most free from anthropogenic sounds.

The clear understory, even in areas dense with briars, significantly impacts sightlines throughout the site. Visitors can easily see passing cars and residential houses from quite deep within the site, especially during the colder months (see Figure 2.49). I was surprised to discover that the area east of the utility line felt the most exposed to the neighboring residences. Although I remained well within the

Figure 2.49 Large residential houses clearly visible within the park boundary. Taken East of the utility line.

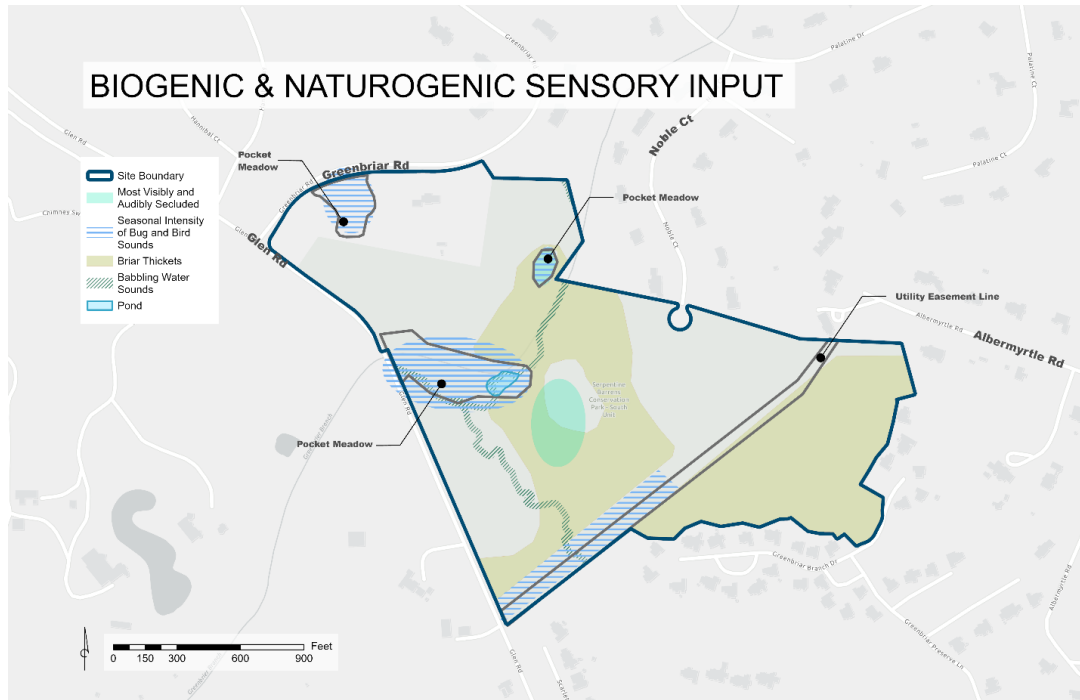


park boundary, it felt as though I was in the private backyards of the houses. As I discussed in the literature review, many neurodivergent individuals, especially Autistics, find the sensation of being perceived uncomfortable. Due to this observation, I chose not to introduce any trails into this area to protect visitors from feeling that they are trespassing or being watched from the residences.

The Glenstone-owned property, likely adjacent to the private residence and the far western portion of the park, experiences the most visibility and sound penetration. As a result, I concluded that any areas of retreat placed in this region would require significant screening. Some areas of retreat may be better located elsewhere.

Figure 2.50 describes the biogenic and naturogenic sensory landscape. During my summer and autumn visits, I noticed the persistent drone of numerous crickets along with the frequent calls of songbirds, particularly song sparrows, cardinals, and crows in the meadow areas. The sounds of the crickets, in particular, helped to mitigate some of the anthropogenic noise. Among all the meadow areas, the northernmost pocket, which is completely surrounded by parkland, had the highest reduction of anthropogenic sounds and the loudest, most frequent insect and bird

Figure 2.50 Mapping biogenic and naturogenic sensory input and relief



calls. Additionally, an area at the geographic center of the park experienced significant shielding from both anthropogenic noise and visibility due to two large patches of pine.

Both the meadow areas and the forested regions with thick, expansive briar patches offered rich visual and tactile textures, though the briar patches were less pleasant to touch. Both environments created visual and tactile “noise” suitable for spaces that encouraged engagement, but less fitting for areas intended for retreat. Nevertheless, certain interventions, such as a simple bench, could enable visitors to choose whether to use the space for retreat or engagement.

The few permanent creeks and streams within the site are all noticeably shallow, with rocky creek beds. In many places, they produce a babbling water sound that provides a soothing backdrop to the immediate area.

Identifying Archetypal Landscapes

To provide some organizational structure for my participatory research, I developed a system of typologies to describe the site. Following the recommendation of one of my committee members, I organized the site into a set of archetypal landscapes. My definition of “archetypal landscape” is a blend of Messervy (2007) and Rainer and West’s (2019). Messervy’s spatial archetypes include seven fundamental forms used to describe all landscapes and built forms: the sea, the cave, the harbor, the promontory, the island, the mountain, and the sky. Rainer and West’s (2019) archetypal landscapes represent four broad conceptual categories of landscapes that are universally understood and appreciated: grasslands, woodlands and shrublands, forests, and edges.

My landscape archetypes are a selection of landscape forms that are widely (if not universally) recognizable across various scales and which I believe exist within a broad collective consciousness, at least in the U.S. Unlike Messervy, Rainer, or West, I employ a mixture of landscape and architecture terms when naming my archetypes. The language of architecture can provide structure and definition to landscape forms, and architecture has a long history of being influenced by natural forms. During the participatory research, which will be discussed in the next section, I used more generic terms for these archetypes to avoid influencing my participants’ reactions to them. I have listed those generic terms below in parentheses, along with the archetype name and description.

I derived these archetypes largely from my experiences, photographs, and notes of the site during my early visits, except for one: *The Massif*. This archetype

Figure 2.51 *The Nave*



Figure 2.52 *The Walled*



Figure 2.53 *The Rill* (in three expressions – pond area, permanent creek, and ephemeral creek)



Figure 2.54 *The Thorn Thicket*



Figure 2.55 *The Massif*

(Unnamed photo of Sourland Mountain Preserve by [Khürt Williams](#), cropped. Licensed under [CC BY 4.0](#))



does not currently exist within the Lower Serpentine Barrens Conservation Park. I developed it after visiting the Rachel Carson Conservation Park in preparation for my sensory audit walks (see section on participatory research later in this chapter). Due to the proximity of the Holcim Mid-Atlantic Travilah Quarry, I believed that this archetypal landscape could be created on the LSBCP site if it received a strong positive response from my participants. As I will explain later, it did.

The Nave (open forest): A forest landscape clear of underbrush. The straight trunks of the trees create columns that bear a lofty canopy. The atmosphere is open, airy. Visibility stretches far. There are few secrets here. (Figure 2.51)

The Walled Garden (meadow/pocket meadow): From enclosure, suddenly into unexpected openness. A ring of forest around a grassy garden. A patch of hot sun within a sea of shade. Stepping out from beneath the leafy ceiling into open air. In the end, a return to the forest. (Figure 2.52)

The Rill (riverside): Shallow, slow water slithering through the landscape. A peaceful glimmer, a burble over stones. Wide and gentle. (Figure 2.53)

The Thorn Thicket (green briar): Easy to see beyond, impossible to pass through. A low tangle of green ready to snatch, catch, and tear. (Figure 2.54)

The Massif (boulder pile): A sudden rocky emergence, a clustered mound, a call to climb, to conquer, to explore. An isolated mountain, a dark tower. An island in the middle of the sea. A refuge on the open plain. (Figure 2.55)

Participatory Design Research

I discussed the significance of participatory design, the advantages of visual-arts-based participatory research methods, the effectiveness of Alexa Vaughn's

accessibility audits, and the growing use of sensory audits for indoor environments in the literature review. My participatory research drew inspiration from all of these sources; however, I designed my own methodology. I involved a group of neurodiverse individuals in a two-part qualitative participatory creative research study aimed at exploring conservation park design through the perspective of neurodivergent experiences. Both stages of this research followed the Universal Design for Learning strategy of “tight goals, flexible means,” (Bacon, 2014) by providing an array of verbal/nonverbal and group/individual avenues for participation. Participants had the flexibility to select the participation method that best suited their comfort and interests.

The first part was a sensory audit walk through Rachel Carson Conservation Park in Brookeville, Maryland. The park features an existing trail system and various design elements, such as interpretive signage. I aimed to use this sensory audit walk to better understand how my neurodivergent participants experience certain landscapes and their preferences and needs for design interventions within a conservation park.

The second part was a participatory design workshop aimed at generating design ideas for this project’s site, the Lower Serpentine Barrens Conservation Park, along with the adjacent current and future Glenstone properties. As mentioned earlier, the LSBCP lacks a trail system or designed features. The Rachel Carson and Lower Serpentine Barrens parks share some landscape similarities (both sites include the five archetypal landscapes identified during the site inventory), though they differ in scale (Rachel Carson covers more acreage, has larger expressions of the archetypal

landscapes, and features greater elevation changes and steeper slopes). The sensory audit walk capitalized on the similarities between the two sites to draw comparisons between the Rachel Carson site and the Lower Serpentine site, thereby preparing participants to engage with the Lower Serpentine site during the design workshop.

I initially planned for the sensory audit walk to occur at the Lower Serpentine Barrens Conservation Park. However, after visiting the site, I realized that the thick Japanese stiltgrass and other vegetation concealed dips, holes, and large fallen branches that could easily cause injury to my participants. Therefore, I chose a location similar to the LSBCP for the sensory audit walk instead. This new site has the added benefit of facilitating discussions on signage and navigation indicators by reflecting on the existing features within the Rachel Carson Conservation Park.

This qualitative research study is IRB certified, and the procedures followed were in accordance with the ethical standards of the Institutional Review Board at the University of Maryland – College Park. I am the principal investigator in this study, and the IRB number is 2222292-3 (See Appendix A for the IRB Exemption Certificate).

Participant Recruitment

I recruited a convenience sample of participants by sending promotional flyers to the email mailing lists of DCPeers and The League for People with Disabilities, drawing from my personal network, and employing a reverse snowball recruitment method (Institutional Review Board, n.d.) where participants reach out to their networks.

To participate, individuals were required to have been diagnosed or to self-diagnose as Autistic, dyslexic, and/or having ADHD; to have a close family member who is Autistic, dyslexic, or who has ADHD; or to hold a job that provided service or support to individuals with Autism, dyslexia, or ADHD. Participants also needed to be 18 years or older at the start of the study.

Participants received \$40 in cash compensation, reimbursement for rideshare (up to \$50) for the sensory audit walk, and food and refreshments during the design workshop.

Part 1: Sensory Audit Walk

I designed the Sensory Audit Walk to engage with participants on the efficacy of specific design decisions in a sample conservation park and assess their sensory relationship with a set of archetypal landscapes common to both the sample park and the LSBCP, all through the lens of neurodivergent experience. I employed a methodology of my own design since I could not find an example of a participatory sensory audit; furthermore, the non-participatory audits only assessed potential triggers for individuals (typically children) with hypersensitivity (Autism Education Fund, n.d.). I did not find any audits that also examined hyposensitivity or preferences regarding types of sensations.

The sensory audit walk occurred on two separate days in November at the Rachel Carson Conservation Park. Participants could choose to attend one of the available dates. The format of the audit remained consistent for both days to ensure comparable data. Although the two dates were two weeks apart, they experienced

similar weather conditions, with sunny skies and temperatures in the mid- to low-60s (Fahrenheit).

The sensory audit lasted two hours. In both cases, I had a volunteer assistant help me log participant responses. Before the first sensory audit, I visited the park to determine the trail route and identify the stops along the way. In choosing the stops, I looked for locations with specific design elements, such as interpretive signage, bridges, wayfinding signage, and the presence of my five archetypal landscapes. The final walking route for the sensory audit was about two miles long with a total of nine stopping locations. In retrospect, while this provided participant feedback on all my topics of interest, two hours was insufficient time for so many stops. Many of the feedback methods I developed for the walk were likely underutilized because participants were not given enough time to linger at each stop.

Before the first walk, I developed a standard set of questions to ask at each stop (see Appendix B for a full list of questions). The questions followed two formats: non-verbal paper cards and verbal discussion. The first type of question requested either a binary yes/no response (e.g., “Does this space need anything to make this transition more comfortable?”) or a value range (e.g., “How likely are you to read the information on this sign?”). Participants answered using two paper cards, one with a smiling face emoji and one with a frowning face emoji (Figure 2.56). Whenever I asked this type of question, I clarified how to use the cards to respond.

Figure 2.56 Face cards



For example, for the question “How likely are you to read the information on this sign?” the smile face card indicated “more likely to read the information,” the frown face card indicated “less likely to read the information,” and the blank back of a card indicated a neutral response. Participants could also use their thumbs in real time as an alternative to the cards, with a “thumbs up” being equivalent to the face card, a “thumbs down” being equivalent to a frown card, and a horizontal thumb being equivalent to the

neutral blank backside of a card. My assistant tallied the number of each response type. These questions represented the structured interview portions of the walk. At each stop, I asked all of the planned face-card questions.

Figure 2.57 Example of questions at one of the stops with introduction script

Stop 1: Interpretive Sign – Finish by 1:20

Intro: This is a very typical interpretive sign used at natural parks. Some parks, like the Serpentine Barrens, have access to additional resources which allow additional ways to educate about the landscape. I’m passing around some photos of examples.

- 😊 How likely are you to read the information on this sign?
- 😊 How likely are you to go out of your way to read this sign?
- 😊 How well does this sign communicate the information to you?

The second question type requested verbal responses; however, I also informed the participants that they could alternatively write their answers and utilize a verbal proxy (i.e., the volunteer helper) to engage in real time. I used these questions to elicit more open-ended responses (e.g., “What aspect of this spot is most enjoyable?”) and encourage conversation among the participants. These questions constituted the semi-structured interview portions of the walk. During stops with planned questions of this type, I asked most, but not all, of the listed questions and occasionally incorporated clarifying or follow-up questions that were not part of the pre-determined set in response to participants’ comments. My assistant recorded the participants’ responses during the discussion.

I assigned at least two face-card questions (with a maximum of four) for every stop along the walk, but I designated only three stops for discussion questions. The same set of five discussion questions was assigned to each of these three stops. I used some of the face-card questions at two or more stops to assess whether the opinions were site-specific or more broadly applicable to the park landscape.

On the days of the sensory audits, I handed each participant a tote bag upon their arrival. The bag included bottled water, electrolyte powder, an energy bar, and a clipboard. I pre-set the clipboard with three pens of different colors (green, blue, and black), the face cards, an instruction sheet, a map of the route with stops numbered, and sheets of blank paper. Additionally, the tote bag contained two sheets of stickers (one with stars of various colors and another with smiley and frown faces) and a small card with a QR code.

The instruction page explained how participants could assess the effectiveness of the park design elements and their own sensory experiences of the landscapes (see Appendix C). In addition to the two types of questions, I encouraged participants to use the pens and stickers to mark their reactions on the map to anything they encountered during the walk or to log anything that captured their attention. I instructed participants to utilize the empty key box at the top of the map to record the meanings

Figure 2.58 Photo by participant of map on clipboard. Narrative read: ““view of my clipboard with the back drop of the grassy path



behind their use of colors, symbols, or stickers (Figure 2.58). Participants could also take photos throughout the walk. The instruction page featured the same QR code as the small card. Each participant received a unique QR code; however, the assignment of the codes was randomized based on the order in which the tote bags were distributed. Participants could use the QR code to upload any photos they took to an online submission form. This submission form permitted four photos to be uploaded at a time but could be used multiple times for additional submissions. For every uploaded photo, there was a text box for participants to note why they took the photo. If participants took photos but didn't have time to upload them during the walk, they could use the QR card (which they were asked to take home with them) to upload the photos later.

After all the participants arrived at the location and received their tote bags, I introduced the project goals and format, explaining how the sensory audit experience was intended to inform the future design workshop and serve as an introduction to the Lower Serpentine Barrens Conservation Park (LSBCP) (Appendix D). During the introduction, I shared printouts of photographs and context maps of the LSBCP (Appendix E). I then transitioned to conducting the sensory audit walk by first reviewing the instruction sheet with the participants and answering questions about the process. Once all questions were addressed, we began the walk.

At each stopping point along the route, I began by explaining why that location was important and how it related to the LSBCP (see Appendix F). I then proceeded with the process of asking the predetermined questions as previously described. In one instance, at the first stop focused on interpretive signage, I distributed printed photographs of alternative sign designs. These images (see Appendix G) aimed to help participants understand that they were not restricted to the signage style present at Rachel Carson Park and to encourage them to think more critically about the design of the signage before them.

Analyzing the Data from the Sensory Audit Walk

I conducted a thematic analysis of the qualitative responses from the walking interviews by coding transcriptions of the verbal responses to the open-ended questions, the marked-up maps, the narratives from the photo submissions, and any additional written comments that participants left on their clipboards with subject tags. When participants used drawings or stickers on their maps, I included written descriptions of the drawings in the transcription or transcribed the meanings of the

Figure 2.59 Participant photo submission of the Massif and narrative



“I like rocks to climb.
There are notes on my

markings as indicated by their map key. For the photography submissions, I provided a description of the photograph's subject along with the narrative transcription. These were coded in the same way as the rest of the transcriptions. I grouped the final list of subject tags into eight categories representing the main topics of the participants' feedback. In the final step, I synthesized these categories into eight major themes of the participants' design and landscape preferences (Figure 2.60). Due to the small number of participants who submitted

photographs and the limited information included in the narratives—possibly due to either not giving participants enough time or their dislike for the user interface of the submission form—I did not conduct a separate photovoice analysis.

I began my analysis of the data from the positive/negative/neutral face card questions with a straightforward statistical analysis assessing the percentage breakdown of “positive,” “neutral,” and “negative” type responses. I then utilized these percentage breakdowns to encode each question with positive, neutral-positive, neutral, negative-neutral, negative, or balanced tags to represent the overall consensus (Figure 2.61). I applied this analysis alongside the themes from the qualitative data during the design phase to identify which senses to emphasize within the archetypal landscapes, what types of features to include, and what improvements to make to the directional and informational signage. Additionally, I employed an early analysis of

Figure 2.60 Topic categories and identifying the themes from the sensory audit walking interviews

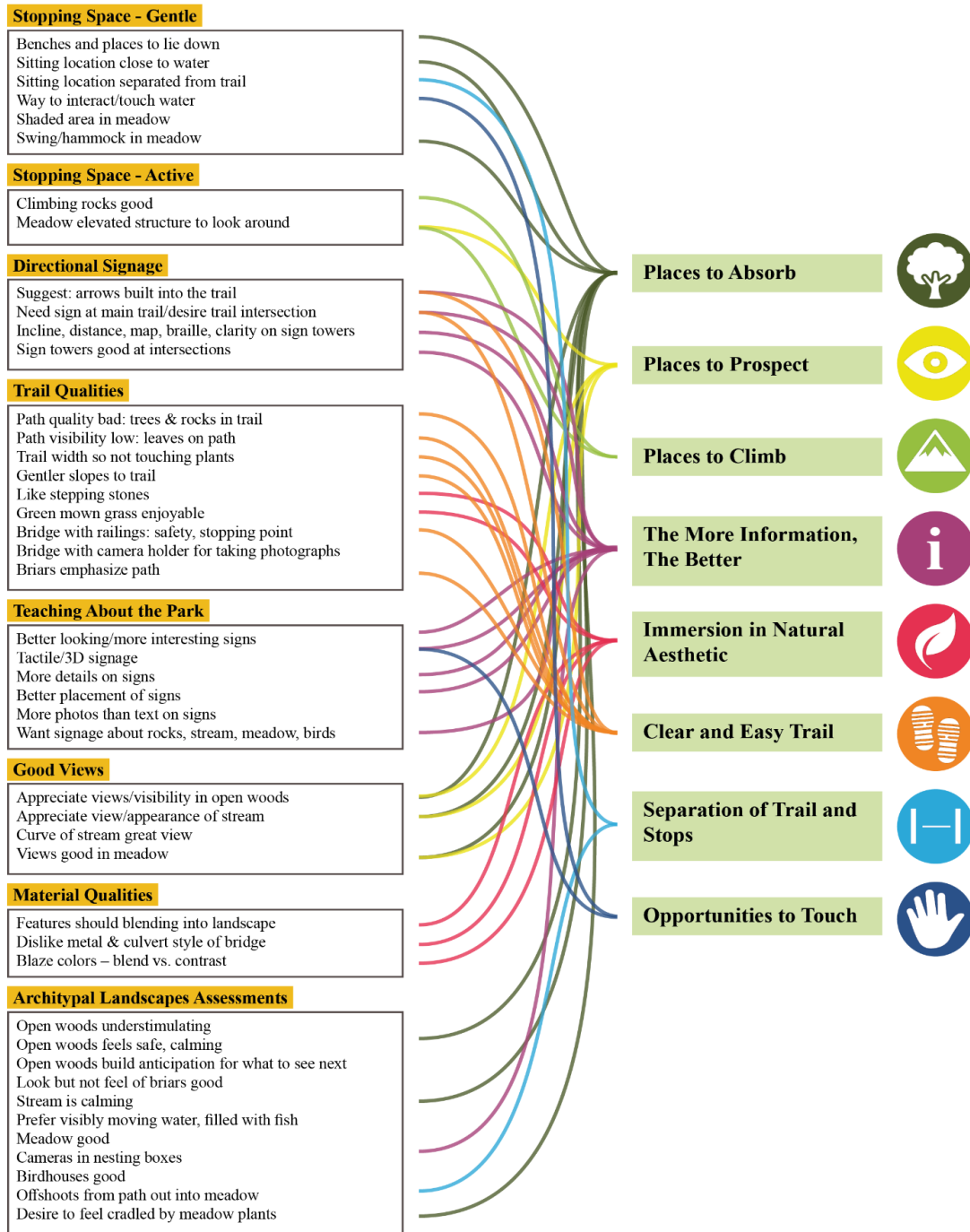


Figure 2.61 Topic categories and identifying the themes from the sensory audit walking interviews

QUESTION	NEGATIVE	NEUTRAL	POSITIVE	CODE
How likely are you to read the information on this sign?	40%	20%	40%	BALANCED
How confident are you that you could navigate the trail systems at this park without getting lost?	40%	20%	40%	BALANCED
How much do you like the way this bridge fades into the landscape?	30%	30%	40%	BALANCED
Does this space need anything to highlight the change more?	30%	30%	40%	BALANCED
How likely are you to go out of your way to read this sign?	50%	20%	30%	NEG-NEUT
Does this space need anything to make this transition more comfortable? *	56%	33%	11%	NEG-NEUT
How do you feel about the textures at this spot? [Briar Forest]	20%	60%	20%	NEUTRAL
How well does this sign communicate the information to you	30%	20%	50%	NEUT-POS
How safe do you feel at this spot? [Open Forest]	30%	20%	50%	NEUT-POS
How do you feel about the scents and smells at this spot? [Briar Forest]	0%	60%	40%	NEUT-POS
How safe do you feel at this spot? [Briar Forest]	0%	40%	60%	NEUT-POS
How well does this tower sign help you decide where to go from here?	0%	40%	60%	NEUT-POS
Does this bridge need anything added to it to make you feel comfortable crossing it? **	20%	10%	70%	POSITIVE
How do you feel about the openness of this [Open Forest] environment?	0%	10%	90%	POSITIVE
*How many people climbed the rocks? ***	0%	0%	100%	POSITIVE
How safe do you feel on or around these boulders?	0%	10%	90%	POSITIVE
How likely are you to go out of your way to visit this boulder pile?	0%	0%	100%	POSITIVE
How do you feel about the sounds at this spot? [Briar Forest]	0%	0%	100%	POSITIVE
How confident are you that you know where we are now in relation to where we started?	10%	10%	80%	POSITIVE
How do you feel about the sounds at this spot? [Riverside]	0%	0%	100%	POSITIVE
How safe do you feel at this spot? [Riverside]	0%	0%	100%	POSITIVE
How safe do you feel crossing this bridge?	0%	10%	90%	POSITIVE
How well does this work as a transition from one type of space to another?	0%	10%	90%	POSITIVE
How do you feel about the sounds at this spot? [Meadow]	0%	10%	90%	POSITIVE
How do you feel about the textures at this spot? [Meadow]	0%	0%	100%	POSITIVE
* NOTE: Negative response indicates noting more is needed				
** NOTE: Positive response indicates that something should be added to increase crossing comfort				
*** NOTE: This was a tally of participants who climbed the wrongs. Participants who climbed were coded as "positive" responses. Participants who did not climb were coded as "negative" responses.				

Positive	Primarily positive responses
Neut-Pos	Primarily positive or neutral responses
Neutral	Primarily neutral responses
Neg-Neut	Primarily negative or neutral responses
Negative	Primarily negative responses
Balanced	Primarily equal or almost equal percentages of negative and positive responses

this data to guide the creation of two conceptual designs for use in the second stage of the participatory research, the design workshop.

Sensory Audit Walk Results

Ten of the eleven participants I had initially recruited attended the sensory audit walk: seven on November 2, 2024, and four on November 16, 2024.

The themes that emerged from the sensory audit walks were *Places to Absorb*; *Places to Prospect*; *Places to Climb*; *The More Information, the Better*; *Immersion in*

Natural Aesthetic; Clear and Easy Trail; Separation of Trail and Stops; and Opportunities to Touch.

Places to Absorb: The participants generally agreed that they desired more spaces to sit and enjoy the natural sensations. Many commented on wanting to listen to the wind, watch patterns of sunlight and shade, and feel the warmth of the sun. Although no one specifically mentioned forest bathing by name, many responses captured its essence. Participants particularly sought a space to absorb the environment at the *Nave* (open forest) and *Rill* (riverside) stops. In response to the *Nave* landscape, one participant commented, “I want someplace [here] where I can lie down and watch the sunlight through the leaves.” When asked what drew their attention most at that location, one participant answered, “The sound of the wind. You can close your eyes here because you feel safe. You can feel the wind and sun on your skin. It’s delicious.” Participants described the *Rill* landscape as serene and picturesque. Many expressed a desire for a bench or clearing where they could relax and watch the sunlight glint on the water.

Places to Prospect: Participants responded positively to the clear sightlines in the *Nave* landscape. One participant shared that the absence of underbrush was appealing because “it builds anticipation for what’s next.” Another participant, using smile and frown stickers to mark on their map “good” and “not so good” aspects of each stop, noted of the *Nave*, “[smiling emoji sticker] Pretty view.” The visibility in this area also allowed participants to stay aware of what was happening around them. As one commented, “I like having an awareness of my surroundings and knowing what’s around.”

The *Walled Garden* (meadow) landscape sparked participants' desire to gain elevation. When asked what would make the location more interesting, enjoyable, or comfortable, one participant responded that they would like a climbing structure or something that would provide them with a greater height so they could look around and see everything. Later, during the same discussion, another participant suggested that the site could benefit from a climbing tree.

Places to Climb: The *Massif* (boulder pile) location generated the most excitement of all the stops. Many comments about this landscape included multiple underlines and exclamation marks. Most were similar to one participant's remark: "Climbing on rocks is THE BEST." At least a few participants seemed comfortable with the *Massif* landscape being used for both high-energy climbing and resting at the same time. One participant noted on their map, "Would lie on for hours." Another participant, submitting a photo of another participant perched on a conveniently bench-like boulder to annotate their map, wrote, "Jealous of this person finding the only good seat on the rocks."

As previously mentioned, the *Walled Garden* landscape sparked some participants' interest in climbing. Along with the climbing structure and climbing tree, participants also proposed adding a slackline at the nearby forest's edge.

The More Information, the Better: Participants were not interested in a park that was stingy with the information it shared with its visitors. Participants requested interpretive signage at every stop except for the *Thorn Thicket* (greenbriar) and directional signage stops. One participant wrote in their notes at the *Massif* location, "Rocks? What are they? How did they get here?" The first stop of the sensory audit

focused on an example of interpretive signage that was about native bird species. One participant wrote in their notes, “I wish the signage actually detailed the calls of the mentioned birds.”

Participants generally approved of the directional towers at each trail intersection, but many noted that they could be improved with additional information, such as the lengths of upcoming trail segments and their steepness. Participants also suggested, both verbally and in their notes, adding a trail map to the tower and including braille on the placards.

Immersion in Natural Aesthetic: Participants expressed a desire for the materials and design to harmonize with the natural environment when discussing the aesthetics of potential features (except for the interpretive and directional signage). When proposing a bench at the *Rill* location, two participants suggested simple log or wooden plank designs. Even the trail blazes were criticized for contrasting too much with the surrounding context, until one participant noted that more subtle blaze marks are also less helpful for navigation. In response to a stream crossing that uses a culvert pipe and gravel to form a simple bridge, one participant wrote in their notes, “I wish the bridge felt more intentional – I like that it blends in and feels like a natural extension to the trail, but the metal parts snag my eye in a way that feels interruptive.”

Depending on the source, sounds can either enhance or detract from the sense of immersion. Participants generally preferred not to hear traffic or airplanes, as they felt these sounds took away from their experience of nature. At the final stop, one group of participants discussed the advantages of these anthropogenic sounds near the

trailhead to create a transitional space between the experience of nature and the “real world.”

Some design ideas suggested by participants particularly highlighted a desire to connect with nature. At the *Walled Garden* location, one participant expressed that they wanted a type of seating or space that would make them feel “cradled” by the grasses.

Clear and Easy Trail: Many participants expressed discomfort with the rocks jutting from the soil along the trail in the *Nave* landscape, creating numerous trip hazards. This situation is likely very similar to what will be found at the final design site due to the shallow soils. They also commented on fallen branches along the trail, leaf litter obscuring the trail direction, and the jutting rocks. One participant wrote in their notes, “Need more visible trail markers: wood poles.” At one point, I pointed out to participants that I was leading them along a well-established desire trail that was not on the official map. One participant commented that the park should install a sign at the intersection with the intentional trail to clarify the official path’s direction so visitors would not get lost.

Figure 2.62 Participant photo submission of the Walled Garden and narrative



“Yummy tasty texture for the eyes!”

Steep sections of the trail received mixed reactions, even when those areas spanned only a few feet. Near the end of the walk, the trail ascends a gradual slope before emerging from the forest into a meadow. Just before this transition, there was a

short segment of very steep trail (estimated at about a 30% incline) and a rocky section. Participants generally appreciated the dramatic reveal of the meadow, but also felt that the steep area could be improved. One participant wrote in their notes, “I like that there’s a steep 'transition' into meadow, but would be good to have an alternate, easier path.”

Separation of Trail and Stops: In several locations, participants expressed a preference for resting or activity spaces to be separated from the trail. In the *Rill* landscape, participants noted that there was no flat area along the trail for resting. One participant interjected, “Actually, a bit of separation from the trail would be good.” While discussing potential additions and improvements to the *Walled Garden* landscape, one participant stepped into the meadow grasses, saying, “There could be a small offshoot here [that leads to something].” The preference for separation was also reflected in participants’ body language. When proposing a seating or resting feature, participants frequently gestured to an area well away from the trail, even if they did not explicitly state where the feature should be.

Opportunities to Touch: Participants expressed an interest in having more opportunities to interact with the environment through touch. During the interpretive signage discussion, a few participants conveyed that they liked the idea of tactile signs or signs with three-dimensional elements, including one participant who noted in their remarks, “would prefer tactile sign w/ [sic] more focus on birds.” At the *Rill*, several participants were disappointed that it was not easier to touch the water. One participant tried to demonstrate the type of interaction they would like to experience by crouching down at the riverbank, but due to the awkward incline, they could not

make contact with the water. At the end of the interview, as we passed through the *Walled Garden* landscape back towards the parking lot, I observed several participants touching the dry seedheads and stalks of the meadow plants as they walked by.

All questions regarding participants' opinions of the ambient sounds received strongly positive responses, regardless of location. This likely reflects a more general preference for naturogenic sounds, rather than participants enjoying the soundscapes linked to specific archetypal landscapes. Although the Rachel Carson Conservation Park is situated on a main rural roadway, the traffic level is lower than that on Glen Road, and the anthropogenic sounds do not reach as far into the park as they do at the LSBCP. In two instances, participants specifically commented on the anthropogenic sounds. In one case, a plane flew overhead right after I asked about sounds. Most participants disliked the noise, except for one with a special interest in planes. Later, during the last stop on the walk (the *Walled Garden* Archetype/meadow stop), one participant voiced displeasure at hearing a passing car on the road. Another participant mentioned that they appreciated hearing human sounds at the end of a trail, as they can help indicate the impending transition back into the outer world.

The *Massif* Archetype/boulder pile location was extremely popular with all participants. Every question about the boulders received enthusiastic responses. When given the chance to climb on the boulders, all ten participants opted to do so. One participant remarked, "I see rocks, I go. I love to climb." Many participants reiterated their positive opinions by marking the boulders as a special place on their maps or notes. One participant simply wrote, "More good rocks!!!"

The *Nave* and *Rill* Archetype (open forest and riverside) locations also received favorable responses, though not quite as enthusiastically as the *Massif*. One participant said of the *Nave* landscape, “I love to look through trees and see layers of trees without obscuring the view.”

Participants noted that the *Rill* location particularly afforded them a sense of safety.

Adding to this, one participant wrote, “The sound of water is always soothing. Also, the glint of the light on the water.” Feelings of safety within the *Nave* landscape were not as strong, although they remained generally positive. In their verbal and written responses, some participants clarified that rocks creating trip hazards on the trail and the autumn leaves partially obscuring it detracted from their sense of safety at that location. One participant wrote, “I want to look around more than I can with the rockiness & feet litter (so slippery).” Participants also expressed strong enjoyment of the textures at the *Walled Garden* location, indicating that this archetypal landscape may be a good setting for tactile interaction and the opportunity to stop and view the landscape.

Of all the archetypal landscapes, participants responded rather tepidly to the *Thorn Thicket* (briar forest) landscape, expressing a neutral reaction to the textures and a weakly positive feeling of safety. Some participants clarified that they liked the appearance of the briar plants but not their texture. One wrote, “I like the look of the

Figure 2.63 Participant photo submission of the Rill and narrative



“Another photo of the pretty view !!”

Figure 2.64 This bridge received mixed opinions



briar, but I also prefer it not being close to my body or encroaching my shoulders.” Another participant noted that the briars helped define the trail, which was a positive for them. The width of the trail likely prevented participants’ opinions from dipping further into the negative. As one wrote, “Trail wide enough to avoid textures.”

A question about the scents at the site also received a weakly positive response. Some participants noticed a pleasant scent of autumn leaves in that location, but many others did not detect any particular scent.

When asked about the point at which the trail exits the forest and enters the *Walled Garden* landscape, participants overwhelmingly indicated that the transition worked well. Most stated that nothing was needed to make it more comfortable. Participants who felt the transition needed improvement clarified with verbal responses that their criticism focused more on the sharp slope of the trail immediately before reaching the forest edge than on the overall transition. When asked whether the space needed any changes to better highlight the transition, participants were divided in their opinions.

One of the stops centered on a culvert-style bridge that allows the trail to cross a creek (Figure 2.60). Participants reported feeling comfortable crossing the bridge, yet they strongly indicated that additional infrastructure would enhance their comfort.

In open-ended responses and written notes, several participants suggested adding railings. Participants also seemed to desire a greater opportunity to linger on the bridge. One participant wrote, “It’s nice how the bridge blends in but a larger bridge w/ [sic] rails may be nice to help people want to stop + [sic] take things in.” Other participants mentioned railings with phone holders for taking selfies. When I asked whether participants liked how the bridge blended into the environment, their opinions were divided. In their notes, some participants clarified that they appreciated the subtlety of the design, although one wrote that from the side, the culvert looks like a sewer.

Participants generally felt that the directional signs at trail intersections were sufficient for helping hikers decide which paths to take. Halfway through the walk, most participants indicated they felt well-oriented regarding their location within the park. However, participants were divided when asked how confident they were in their ability to navigate the park without getting lost. I should note that some participants questioned whether they could answer accurately, since I had provided them with a basic map. I instructed participants that if they typically brought a map, they should include the use of the provided map when considering their answer. If they did not typically bring maps, they should try to respond as if I had not supplied them with a map. Nevertheless, using the map may have influenced the participants’ responses, potentially inflating navigational confidence beyond what it would be otherwise.

The informational sign at the start of the walk received generally less positive responses. Participants were somewhat unenthusiastic about the sign’s ability to

communicate its information. Some participants expressed appreciation for the size and number of images on the sign relative to the amount of text. However, participants generally felt they would not go out of their way to read the sign and were divided over how likely they were to read it. I neglected to ask participants how likely they were to spend time looking at the images, only inquiring if they would read the text. It is possible that some participants, especially those with ADHD, may have been willing to engage with the sign by observing the images without ever reading the text. However, in verbal responses, participants had mixed feelings about the images' effectiveness, noting that the aging and dirty plastic deterred engagement. One participant commented, "The sign is functional but boring. I would prefer a tactile sign with more focus on birds like in the [reference photos]." Participants generally noted that they preferred the reference examples to the more utilitarian design used at the Rachel Carson Conservation Park. One participant remarked about the Rachel Carson informational sign, "It's more functional than engaging."

Part 2: Design Workshop

I invited the eleven participants from the sensory audits to join the subsequent design workshop. Two participants who attended the sensory audits faced emergencies on the day of the design workshop and were unable to attend. Unlike the sensory audit walks, the design workshop was a one-time event. An email poll was conducted to select a date and time when most participants would be available. Because of the holidays, the earliest available day was approximately two months after the second sensory audit.

I chose The Loft at the Edward St. John Learning and Teaching Center because it was a relatively central location on the University of Maryland campus with good access to public transportation. The room was specifically chosen for its natural light, flexible space, and absence of strong odors. Additionally, the room permitted food and was relatively isolated from distracting sounds and movement. Two assistants helped me set up the space and log participant responses during the event. Although participants signed permission to be video/audio recorded, no recording took place that day due to insufficient equipment access.

The design workshop was scheduled for 2.5 hours. During the first half hour, I provided participants with a deeper introduction to the LSBCP design site. At this point, I was using the intermediate site boundary described earlier in this chapter, which included the LSBCP, the current Glenstone-owned property, and residential properties extending halfway to the Upper Serpentine Barrens Conservation Park. The design and feedback activities during the workshop were based on this version of the design site.

To introduce the site, I utilized a PowerPoint presentation along with printed materials, including reference maps, comparative section cuts of Rachel Carson Conservation Park and the LSBCP, photographs taken during my site visits, and samples of serpentine rock to provide a physical texture. Throughout the workshop, I showcased two large plan maps of the site at the front of the room, accompanied by a sample of abiotic and biotic context information (see Appendix H for maps and supplemental materials).

At the start of the introductory presentation, I reviewed the workshop agenda and provided advance instructions on the three breakout activities that would occur in the second hour. Then, since two months (including the year-end holiday season) had passed since the sensory audits, I used images of the Rachel Carson Conservation Park, including two photos taken by participants, to remind everyone of their experiences during the walks, particularly the archetypal landscapes and design elements we had audited.

Next, I introduced the LSBCP and the overall design area that we would utilize during the workshop. I began by providing context for the park, including its location, size, access, opportunities for access, and nearby park systems (see Appendix I). Then, I explained the relationship between the park site and the larger design site.

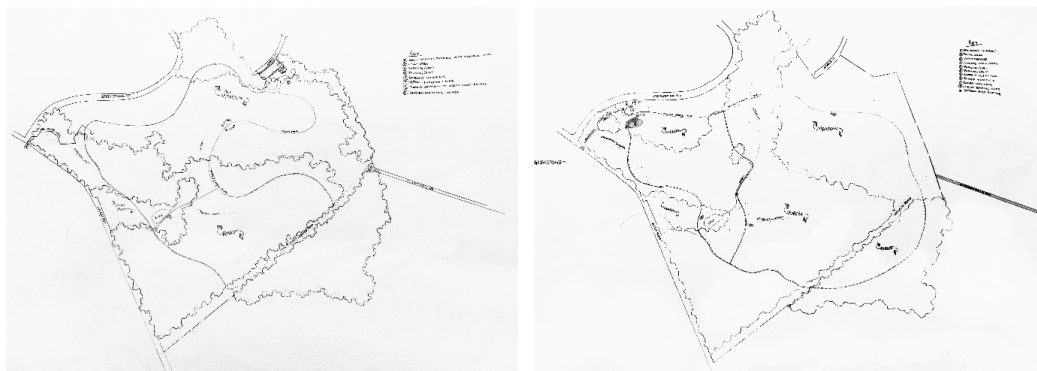
To bridge the participants' experiences during the audit walk with their understanding of the design site, I compared the Rachel Carson Conservation Park to the LSBCP design area, assuming that none of the participants were familiar with the LSBCP or its surrounding area. I used comparative maps of the same scale featuring information on forest cover, meadow (dry and wetland) areas, and residential areas primarily consisting of lawns, stream paths, ephemeral creeks, and topography (see Appendix J). The Rachel Carson map also displayed the trail system (the LSBCP does not have a trail system). Additionally, I compared sections printed on 18" by 48" paper, showcasing the longest width of the meadow on the LSBCP against a section of the Rachel Carson meadow that intersects with the meadow stopping point used during the audit walk. This comparison highlighted the difference in size, openness,

and slope of the two meadow areas (Appendix K). These comparisons were intended to convey that the LSBCP and its archetypal landscapes are significantly smaller in scale and flatter than those at the Rachel Carson Conservation Park.

Next, I explored the LSBC through photo analysis of three archetypal landscapes: *Nave*, *Rill*, and *Walled Garden* (see Appendix L), along with short videos showcasing three locations within the LSBCP to emphasize the varying levels of anthropogenic sounds from nearby traffic. Additional printed photos of the park and samples of serpentine rock were displayed on the table where participants were seated.

At the conclusion of the presentation, I showcased two conceptual designs for the design study area. These designs were hand-drawn with a pencil on paper at a scale of 1 inch = 150 feet (Figure 2.65). I chose this scale to ensure that the entire site would fit on 34-inch by 36-inch paper, making it easier to manage within the workshop space. This scale also allowed for a more focused level of detail on the uses

Figure 2.65 Two concept diagrams used in the design workshop. **Left** Concept 1 with more open layout, forest only at bottom half of site, but wooded edges in top half. **Right** Concept 2 with forest following Greenbriar Branch through center of top half but no forested edges.



of space rather than on the design of specific features. The two designs presented very different approaches to the overall site design, especially in patterns of reforestation and meadow restoration of the formerly residential areas, as well as in the locations for site access. They also included various types of stopping areas featuring different levels of movement, rest, and visibility. I described these concepts as examples to illustrate the broad possibilities for design. I did not want my participants to view these examples as two distinct options but rather as a menu of design choices they could evaluate and draw inspiration from.

Due to a late start to the workshop, I solicited feedback on the designs during lunch alongside the originally planned lunchtime discussion. I adapted a set of predetermined questions to guide the discussion in a semi-structured interview style (Appendix M). My goal was to help participants process the substantial information they received during the introduction and allow them to provide feedback on the two conceptual designs. In total, lunch lasted 30 minutes, with twenty minutes dedicated to discussion. If I were to design another workshop, I would allocate twice the time for this discussion. Although I received valuable responses from participants, I felt that I had to cut the conversation short to ensure enough time for the rest of the event.

Right after lunch, I led a five-minute visualization exercise. I asked the participants to close their eyes and remember a park visit that was meaningful to them. Through a series of questions, I guided them to focus on different aspects of the experience, such as whether they were sitting, walking, alone, or with someone (see Appendix N). This exercise served as a transition into the creative and generative activities that would take place for the rest of the workshop. Additionally, it acted as a

model for envisioning elements of park design and experiences, setting the stage for the type of information that the breakout exercises would seek.

For the remaining fifty minutes of the workshop, participants broke into three separate activities; each activity lasted twenty minutes, with five minutes of transitional time in between. The same set of three activities was available to participants during each round of activity time. At the start of each round, I encouraged participants to engage in an activity they had not yet tried, but I noted that they were not required to do so. I felt it was important to allow flexibility under the assumption that participants would provide better responses for activities they freely chose to engage in. Visual timers were present at each station to give participants a visual gauge of how much time remained in the 20 minutes before the next transition period. I also provided each table with instruction sheets and worksheets for the activity at each location (see Appendix O–T, Figure 2.66).

Figure 2.66 Worksheet (left) and instructions (right) for visual art breakout activity.

Design Title: _____ Design Notes (Materials/Location/Use/Parts/Etc.) - Continue on the back or a separate page if needed. Design: _____	ACTIVITY 2: MAKE A DESIGN INSTRUCTIONS WORK ON YOUR OWN: 20 MINUTES PROMPT: Design an element, space, or structure for the Lower Serpentine Barrens Conservation Park. It can be something as small as a single sign or as large as an amphitheater. Consider: Where is it? How big is it? How should it be used? Who is it designed for? What material or materials is it made or built from? How often will it be used? Create a 2D or 3D Representation of Your Design.  Make a model: Use any of the modeling supplies (clay, pipe cleaners, toothpicks, coffee stirrers) to create a 3D model. Use a worksheet to log the details about your design, including what it is, what materials it would be made out of, and where you would put it. At the end of the 20 minutes, place your model on top of your worksheet and leave them on the display table. OR  Draw a picture or diagram: Use markers, colored pencils, and/or pens to draw a picture or diagram of your design on a worksheet. Make sure to label the parts of your design and notate additional details such as what materials it would be made out of, and where you would put it. At the end of the 20 minutes, place your worksheet on the display table. Remember: You only have 20 minutes!
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The first activity was a writing exercise that participants completed individually. They were invited to write about a perfect hypothetical day at the Lower Serpentine Barrens Conservation Park. Responding to a written prompt along with a set of consideration questions on the instruction sheets helped focus participants on the type of information I sought, such as “Who are you with?” and “What are you doing?” (see Appendix O). Participants used the provided worksheets, which included a space to title their story and log their narratives. They could also staple additional pages to the worksheet if their narrative exceeded the provided space (see Appendix P). This writing exercise explored how participants wished to spend their time in the park, allowing me to understand what kinds of activities they desired to engage in (including the level of movement through the park) and what kind of facilities or spaces might be necessary to accommodate these activities.

The second activity was a visual arts exercise. Participants used a variety of craft supplies (markers, colored pencils, pens, foam craft clay, colored pipe cleaners, toothpicks, and coffee stirrers) to create two-dimensional (2D) or three-dimensional (3D) representations of design elements for the LSBCP. They could design at any scale, ranging from a single sign to an entire area. As in the writing exercise, I included additional questions for consideration on the instruction page to guide participants in exploring specific details about their designs (see Appendix Q). Participants used the worksheet to title their designs and to write notes explaining their design choices and materials (see Appendix R). 2D designs could be drawn in the space provided on the worksheet or on a separate sheet that would be stapled to the worksheet. 3D designs were placed on top of the worksheet. Participants could

use the materials in any way they desired. My goal for this activity was to assess the aesthetics, use of materials, and use of space that participants were most drawn to, as well as to gain a better understanding of the types of spaces participants wished to engage with.

The third activity was a collaborative brainstorming session. In this activity, participants collaborated to design an event that would occur within the LSBCP. Similar to the previous activities, the instruction page contained additional questions for consideration to guide the brainstorming discussion (see Appendix S). Participants utilized the worksheet to document their conversation. The worksheet featured a series of boxes for responses, each with topic prompts derived from the consideration questions on the instruction page (see Appendix T). My aim for this activity was to explore the desired relationship between the park and the broader public or specific communities, emphasizing what services the park could offer for community use and what types of spaces might be necessary to support these uses.

Analyzing the Data from the Design Workshop

To analyze the data from the workshop, I first transcribed the breakout activity submissions (I also photographed the art submissions). Then, I generated a list of tags for each submission in three categories: use qualities (how the feature(s) would be used and what qualities are associated with those uses), feature/element type (what type of feature(s) is/are represented), and material qualities (what materials the feature(s) are made with, the aesthetic qualities those materials bring, and details about the build of the feature(s)). I also transcribed the lunchtime

Figure 2.67 Ranked *use qualities*.

Most Desired Qualities	Second-Most Desired	Honorable Mentions
interactive	resting/restful	passive movement (wind)
linger/stay	active movement	prospect refuge
low energy	physical challenge	hiding
solo	all ages	learning
social	high energy	walking
passive viewing (nature)	low-medium energy	medium-fast movement
journey/traverse	all bodies accessible	passive sound
light physical	mixed energy	removed from active area
slow movement	eating	activity: photography
community use (event)	gathering/event use	private use
body rest	passive viewing (performance)	fast movement
	natural feature (interactive)	medium-high energy
	natural feature (passive)	activity: portable hobby
	passive interaction: heat (sunlight)	passive viewing (built feature)
	climbing	community-use (communication)
	periscoping	passive interaction (aroma)
	activity: art making event	meditation
	touch interactive	

conversation and design feedback, inventorying them in a similar manner. I logged material qualities tags only where participants specifically referenced them.

I next created a de-duplicated list of the use quality tags and recorded the number of instances for each tag. This resulted in a priority list of desired qualities for features on the site. I categorized the quality tags with six or more instances as Most Desired Qualities, three to five as Second Most Desired, and all tags with fewer than three instances as Honorable Mentions (Figure 2.67). I then used this ranked list of quality attributes to guide the final design solution. Whenever I considered adding a feature or element that the participants had not specifically proposed, I referred to this ranked list to determine the type of feature or element based on its intended use.

I collected the feature and element type tags into a de-duplicated list, which served as a reference for options to include in the final design (Figure 2.68). I removed the tags for features that were already guaranteed to be included, such as bathrooms and trails or paths. To give the list some prioritization, I tallied how many

Figure 2.68 *Feature/Element Type Category Tags*

accessible path	enclosed event room	parabolic sound reflector	stepping stumps
amphitheater / theater	enclosed meadows	picnic area	sun protection
archway	gazebo	playing space	swings/swing bench
art installation	hammock	pond/wetland restoration	touch-sensory handrail
art making space	hide	public transportation access	viewing structure
bird nest viewing box	instrument	rain protection (built)	water access
boardwalk	interactive art	raised platform	wind chimes
bonfire	Intra-meadow event space	reflective art	
boulders	labyrinth path	rock photo feature	
bridge	landmark	rocking chairs	
bulletin board	lawn (level for event seating)	sculpture/sculpture garden	
bus drop-off	loop trail	seats with backs	
climbing structure	lying down furniture	sensory trail	
community event space	loop trail	shadow art	
drinking fountains	music space	sound screening	

use quality category tags applied to each feature and element type tag. I highlighted the tags with four or more “most desired qualities” tags in purple to indicate features or elements that best reflect these qualities. I also highlighted any feature or element type tag that did not qualify for the purple highlight but could be associated with five or more “most desired qualities” and/or “second-most desired” use quality tags in blue to indicate features with a strong association with desired qualities.

For the material qualities tags, I created a deduplicated master list, which I then organized into “material type” and “qualities of construction” category lists (Figure 2.69). Later in the design stage, I used these lists as a palette to draw from and as an aesthetic guide for feature and element designs.

Overall, the information from the workshop aligned with many themes in the walkthrough. The Places to Absorb and Places to Prospect themes were particularly

relevant to the types of spaces participants often mentioned.

Consequently, most of the “Most Desired Qualities” tags are associated with areas for rest, relaxation, and nature viewing. Numerous “Perfect Day” narratives included gentle walking, sitting, enjoying nature, and participating in arts and crafts. One participant wrote,

Figure 2.69 Material type and qualities of construction

<i>Material</i>	<i>Qualities of Construction</i>
bits of nature	architecturally interesting
concrete	clean edges (for shadows)
mulch	natural appearance
netting	nature-inspired
reflective material	non-contrasting with environment
rock	recycled/reclaimed
string / rope	seasonally refreshed/replaced
vegetation: dry	simple construction
vegetation: live	sound screening
wood	

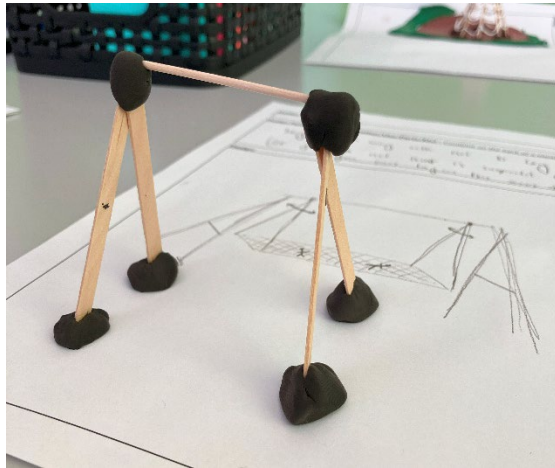
A perfect day at the park would consist of a low-key art class. The group, maybe 5 – 10 people, would start at a notable landmark that everyone could easily find, such as a gazebo. Everyone would get a sketchpad and pencils, or maybe a pad of watercolor paper and paint. Then we would all walk around the park’s walking trail. We’d stop at all the interesting features: a rock pile, the pond, a creek, a particularly attention-grabbing tree, a patch of native wildflowers, whatever.

Several submissions expressed a desire for spaces that facilitate resting and experiencing natural sensations, whether that involved a particular view, the warmth of sunlight, or the sound of the wind, among others. One participant described their art submission (Figure 2.70) as, “Large wooden swing with net

to lay [sic] on (or just a net that is suspended high so you can lay [sic] in the sun + feel the breeze).”

Participants frequently mentioned the need for community event spaces, which was surprising given the limited references during the sensory audit walks. This interest was likely influenced by the conceptual designs we reviewed earlier in the workshop, featuring elements like a

Figure 2.70 Wooden swings model



welcome pavilion and an amphitheater. Several participants expressed interest in using the amphitheater for outdoor theater performances. One participant included in their “Perfect Day” narrative, “We stop for lunch at the amphitheater where a local theater group is rehearsing King Lear. They don’t mind our sneak peek of the performance.” Participants also showed interest in a more general space for community art events or collaborative art installations. One wrote in their narrative, “An area dedicated to a creative activity (art, music, drama) would be a lovely spot to have free local small events.”

Meanwhile, the Places to Climb theme stood out in the “Second-Most Desired” list, featuring several tags related to high energy, physical activity, and climbing. I should note that my choice of analysis methodology for the design workshop favored repetition over enthusiasm. There were fewer overall references to climbing structures than to resting areas, but some participants expressed strong

desires for climbing spaces. One participant wrote in their narrative, “I want a scavenger hunt for different flora, fauna, geographical features, landmarks, etc. I want places to play + [sic] to climb. [Investigator’s note: climb was underlined three times.]” Although I did not factor in the intensity of preferences during the analysis, I kept these instances in mind during the design phase.

There were not many surprises among the material quality tags. Most of the tags aligned with comments from the walkthrough expressing a preference for natural materials and construction that blended with the surrounding landscape. One participant broke this mold by suggesting in their narrative, “A statue that either reflects light or creates a long afternoon shadow would be so cool to walk up to and around.” The preference for natural materials may have been more than just a desire for elements to match the landscape but also a rejection of standard or utilitarian designs. During the wrap-up conversation at the end of the event, one participant commented, “I want it to be functional, but I want it to retain a sense of whimsy. [Things are] a lot more convenient now with modern infrastructure, and it’s ugly! I miss being in the mountains!”

During the lunchtime conversation and design feedback discussion, two participants mentioned that they preferred how one of the conceptual plans enclosed the meadows within a border of trees (Figure 2.71). Participants reiterated this desire for enclosure in various ways within their activity submissions. In the description for their 3D model of a treehouse bird viewer (Figure 2.72), one participant wrote, “Make a bird hide! Crawl into a dark, hidden, silent space to observe wildlife. Up in a tree would be awesome. Access from a wooden slat ladder nailed to the tree trunk.”

Figure 2.71 Concept 1, color added for emphasis. Trees surround expanded and restored meadows.



There wasn't much conversation about informational signage during the design workshop, aside from a few passing references in the activity submissions. However, one participant commented during the final wrap-up conversation, "I want every plaque to not be boring... at the minimum, tactile." Similarly, participants generally did not focus on the design of seating elements (other than a clear call for backrests) until the wrap-up discussion.

Figure 2.72 Bird hide model



Responding to one of the precedent example images, one participant remarked, “Park benches are boring. I want to see more things like in these [photographs].” After debating various possible seating designs, including dynamic chairs, rocking chairs, and benches with backrests that allow sitters to face a variety of directions, one participant concluded the conversation by stating, “Every part should be designed intentionally, including seating.”

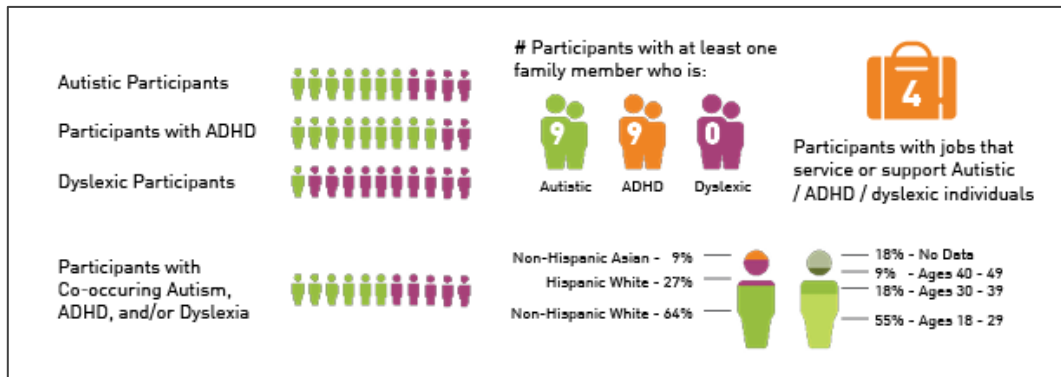
Demographic Survey

After the design workshop, I asked participants to complete a short, anonymous online demographics questionnaire. The questionnaire inquired about age, ethnicity, race, and diagnosis (including self-diagnosis) of Autism, ADHD, and/or dyslexia. It also asked whether any close family members had been diagnosed or self-diagnosed with Autism, ADHD, and/or dyslexia, and if the participants’ work was intended to provide service or support to individuals with these neurotypes. Participants could indicate combinations of neurotypes for themselves and their family members, as well as the option to opt out of these questions (see Appendix U).

Analyzing the Demographic Survey Data

I took a straightforward statistical approach to analyzing the demographic survey data, as this data aimed to provide a general context regarding who was (and was not) represented within my sample group (Figure 2.73). All eleven participants responded to the survey. The results indicated a balanced representation of Autism and ADHD (seven and nine, respectively), but only one dyslexic participant. The participants were also evenly divided between those with co-occurrences of Autism,

Figure 2.73 Results from the demographic survey show somewhat balanced ND representation but limited racial/ethnic and age representation



ADHD, and/or dyslexia, and those with single diagnoses. Six participants had dual diagnoses, while five participants had only one. Interestingly, although one of my participants anecdotally mentioned participating on behalf of their underage Autistic children, all participants indicated that they experience at least one of the three neurodivergent neurotypes.

I collected data on whether participants had close family members with autism, ADHD, or dyslexia under the assumption that some participants might be acting as proxies for family members who could not participate themselves, and because participants' responses may have been shaped by their own experiences along with those of their close family. The results closely mirrored the participants' own experiences. Nine participants indicated having Autistic family members, nine participants indicated family members with ADHD, and no participants indicated having dyslexic family members.

Similar to the family data, I collected information about whether the participants' work intentionally provides service or support for autistic, ADHD, and/or dyslexic individuals. To the best of my ability, I crafted this question to clarify

that I was not referring to general service work, which may incidentally support neurodivergent individuals. For example, while a librarian might offer critical support (access to resources) to some Autistic individuals, providing this specific support is not a librarian's primary role. However, I should note that because of time constraints, I could not adequately test the wording of this question beforehand, and some participants may have misinterpreted its intent. As previously mentioned, the eligibility criteria for participants included those who were not themselves Autistic, ADHD, or dyslexic, but whose work served at least one of these populations. When I started working with my participants, I suspected that none matched this description. Ultimately, only four participants indicated this type of work. Three of those four participants reported that their work served Autistic, ADHD, and dyslexic individuals, while one participant stated that their work specifically provides service or support to Autistic individuals.

Our cultural context and its relationship to the racialized systems we navigate can significantly influence our experiences of public green spaces. I gathered race and ethnicity information from participants to better understand the potential broader applicability of this research. Seven participants identified as non-Hispanic White, while three were Hispanic White, and one identified as non-Hispanic Asian.

An individual's experiences and preferences can be significantly influenced by their stage in life and the cultural context in which they grew up. I gathered information on the participants' ages to better understand how this may have influenced their responses. Six participants reported being between the ages of 18 and 29. Two participants fell within the age range of 30 to 39, both younger than 35. One

participant stated that they were in their early 40s. The final two participants chose not to answer.

This data reveals that the results of this study most strongly represent the preferences of young Autistic and ADHD White individuals (both Hispanic and non-Hispanic). Since only one participant indicated a dyslexia diagnosis and no participants acted as a proxy for dyslexic individuals, this research should not be interpreted as representing dyslexic experiences of park landscapes. I suspect the low rate of dyslexic participants may have stemmed from inadequate outreach and promotion to dyslexia peer groups during my recruitment phase. It is also possible that dyslexic individuals were generally less interested in participating, as the influence of dyslexia on spatial awareness and sensory processing is typically felt more subtly than that of Autism and ADHD.

Due to the limited range of age and race representation, I would also caution against taking this study to be broadly applicable to all Autistic and ADHD individuals. Younger individuals are more likely to hold liberal-leaning green ideologies and are more inclined than their older counterparts to have preferences influenced by aesthetic subcultures established through online communities. Furthermore, White individuals enjoy privilege within our racialized cultural system. Citizens and law enforcement alike often extend assumptions of goodwill, good behavior, and good character to White individuals while treating Black and Brown individuals with suspicion and violence. Black Autistic individuals, in particular, face an increased risk of becoming victims of violence during encounters with law enforcement (Yates Flanagan, 2024). Repeated experiences of micro- and

macroaggressions in public parks likely shape Black and Brown perceptions of space in ways not well represented in this study. Additionally, this study likely does not adequately capture non-White cultural understandings about the use and purpose of public green space.

Lastly, it is important to note that this sample group was primarily, if not entirely, composed of individuals with lower support needs. None of my participants required the assistance of an aide during either of the events. Although I provided non-verbal options for participation, all of my participants communicated verbally on the days they attended. Additionally, due to eligibility constraints, I could not include anyone with support needs high enough that they would not have been able to sign consent for themselves. These individuals face the most ostracism and exclusion from public spaces, and their perspectives are often overlooked in planning and decision-making processes.

Ultimately, this study was qualitative with a small sample size, which inherently limits the broader applicability of the results. It serves as a test of a potential methodology for neurodivergent disability-centered design. Furthermore, the information gathered from this sample group represents a collection of authentic experiences. Regardless of any wider application, the opinions and ideas shared by the participants throughout this study hold significant value for guiding the project's final design and achieving a deeper understanding of how to conduct neurodivergent-centered design.

Final Design

Using the Disability-Centered Design framework that I developed at the beginning of this chapter, I synthesized the site inventory and analysis, along with the data from the participatory research, to create a proposed landscape design for the LSBCP and trailhead properties. In the next chapter, I will describe this design solution and explore how the research informed my design decisions.

Chapter 4: Results

The final stage of this MLA thesis research involved developing a design solution for the Lower Serpentine Barrens Conservation Park centered on neurodiversity. This design aimed to explore neurodivergent landscape design and the strengths and weaknesses of a disability-centered approach to designing public parks. This chapter will discuss the design solution and how my literature review, inventory, analysis, and participatory research informed the design decisions. In the following chapter, I will examine the successes and shortcomings of this design and reflect on the effectiveness of my research methodology.

Defining Design Objectives

While my overall goal was to center neurodivergence in the design, it was also important to define more specific objectives. I began by examining the themes identified in the sensory audit (Figure 3.00). I then consolidated these themes into two objectives: combining 'The More Information, The Better' and 'Clear and Easy Trail,' and grouping the remaining themes. The resulting objectives are:

Objective 1: Develop visual and written systems for clear and thorough communication about the site.

Figure 3.00 Themes extracted from the sensory audit walks.



Objective 2: Develop a nature-based design that allows full engagement and immersion in the natural (non-anthropogenic) environment.

I also reviewed the features and elements extracted from the design workshop and the ranked list of desired use qualities (Figure 3.01). These provided a toolbox of options to incorporate into the design. Although I had not conducted a full thematic analysis of these elements and qualities, I observed strong preferences for spaces facilitating movement, community events (particularly art-related activities), and opportunities to engage the senses beyond just viewing, listening to, or touching the

Figure 3.01 Sampling of features and elements from the design workshop, ranked by association with top desired qualities and second-most desired qualities.

Having Top Desired Qualities	Having Second-Most Desired Qualities
art making space	accessible path
bonfire	amphitheater / theater
gazebo	boulders
hammock	climbing structure
hide	instrument
pond/wetland restoration	interactive art
rocking chairs	Intra-meadow event space
swings/swing bench	music space
	picnic area
	playing space
	seats with backs
	sensory trail
	viewing structure
	water access

natural environment. Additionally, I observed a desire for recognizably park-associated facilities, such as picnic areas, play spaces, water fountains, and bathrooms. I did not create a separate objective for these, as they were already addressed by the overall goal of designing a public park. After reviewing these results, I developed a third objective:

Objective 3: Include areas facilitating interaction through art, community events, and sensory play.

Much of the inventory and analysis included information that could support the first two objectives. The history of the site, the broader community, and the unique geological and biological aspects of the serpentine barrens ecosystem all

provide excellent content for informational signs. Information about the areas of anthropogenic sensory intrusion is an important factor in facilitating nature immersion. I saw that two additional challenges needed to be addressed. These became the two final objectives:

Objective 4: Facilitate multi-modal access into the park, including public transportation connections.

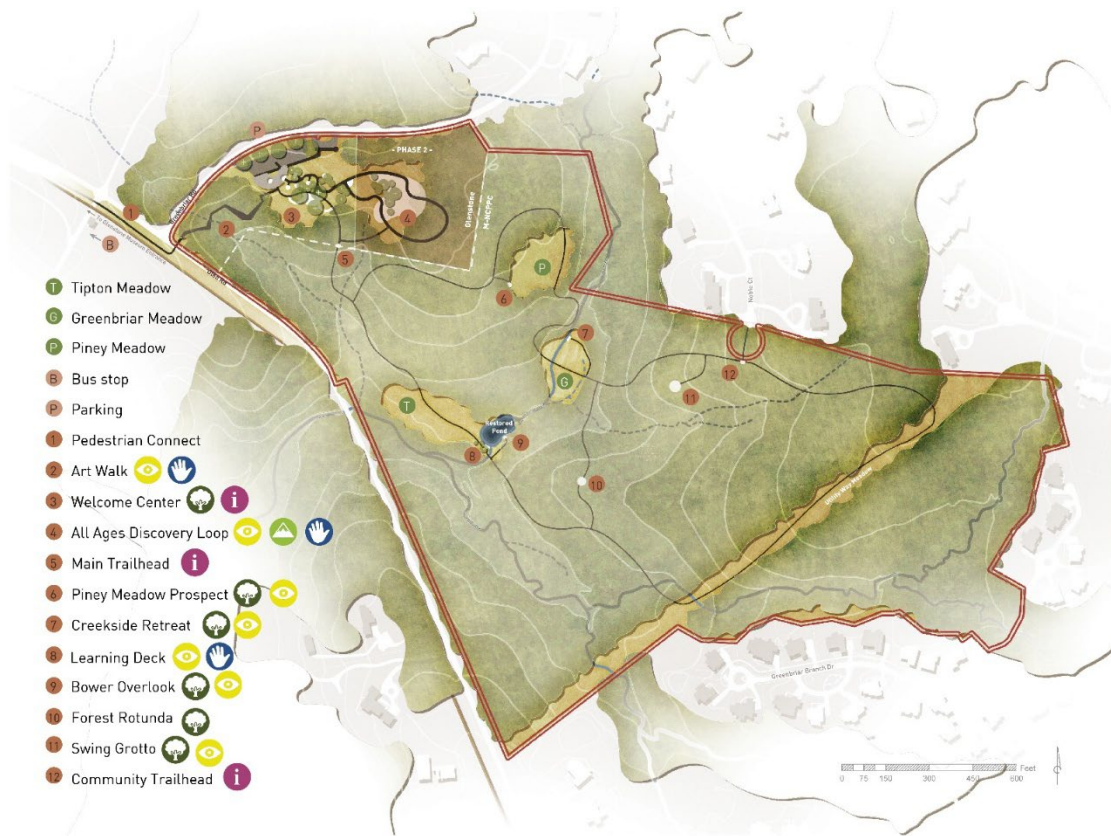
Objective 5: Reduce current soil erosion rates and prevent new erosion causes.

With these objectives in place, I was able to develop a design solution that directly responds to the site's unique qualities and the goal of centering neurodivergence in the landscape. The following section will explore the design solution itself, detailing how the objectives were translated into actionable design elements and how those elements contributed to honoring the diverse neurodivergent experience.

Design Overview

Due to part of the design site being privately owned as a residential property, I divided the design into two implementation stages (Figure 3.02). The first stage encompasses the M-NCPPC conservation park and the property already owned by Glenstone. Both properties receive minimal maintenance and contain no development or designed features other than remnants from previous residential use. Stage 1 of the new site plan introduces a Trailhead Welcome Center to the Glenstone property with a connecting boardwalk to the intersection of Glen Road and Greenbriar Road. The Welcome Center leads to trail access into the LSBCP, where visitors can walk along a

Figure 3.02 A Neuro-Affirming Lower Serpentine Barrens Conservation Park



1.2-mile loop trail. A connection within this outer loop creates an optional shorter .6-mile loop trail. Community members can also access the trails directly via the Noble Court trailhead. Additional community access paths may be implemented by formalizing future desire paths. This ensures that connecting trails are placed correctly to prevent unnecessary interventions. Stage two, which can be added to the design once Glenstone purchases the property, completes the site design with a sensory-engaging art and exploration loop that extends from the Welcome Center.

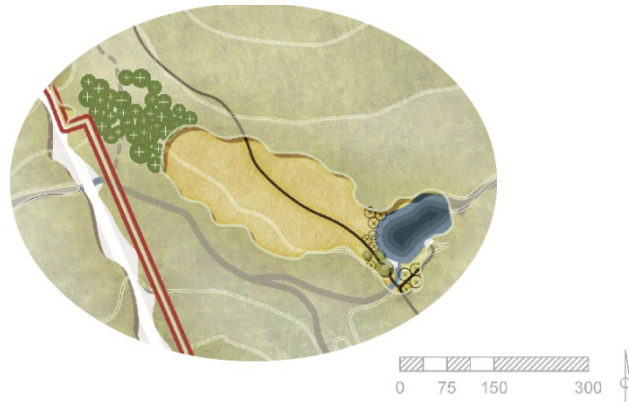
The current and future Glenstone-owned properties take advantage of recently disturbed soils and the infrastructure left behind by previous residential structures to support more intensive interventions. These include car and bus parking

for school and group visits, a covered open-air pavilion with restroom facilities, and a small amphitheater. While the design prioritizes neurodivergent experiences, I also aimed to include accessibility features that benefit other types of disabilities, as long as they didn't conflict with this primary goal. The pathways in this area are more robust than those in the park portion, incorporating wheelchair-accessible materials like pavers and stone dust. To mitigate the impact of new impervious surfaces, stormwater management strategies are included, such as pervious materials for the parking lot and a green roof on the pavilion.

The design includes some ecological design intended to increase long-term environmental sustainability and human recreational value. Based on the recommendation from the Ellis (2022) report, I propose clearing portions of two invasive pine groves in key locations to create new and expanded meadow space. The first is along the edge of the current northernmost meadow, which I have called Piney Meadow after the property's former name. This expands the meadow area from nearly a quarter acre to just under a full acre. Clearing an additional three-quarter-acre patch creates a new third *Walled Garden* between Piney Meadow and Tipton Meadow. The Greenbriar Branch bisects it. As I explored in the last chapter, although trees serve as better tools for erosion control in typical conditions, evidence from within the LSBCP site indicates that the meadow areas provide better soil stabilization than the forested areas, likely due to the shallow soil depth and general lack of underbrush. Combined with riffle and pool installations, this change will slow the peak flow of the stream while providing better bank structure. At the same time, it creates the opportunity to combine the archetypal *Walled Garden* and *Rill* landscapes.

The burbling water sounds from the riffle installations combined with the summer cricket songs will help to filter out anthropogenic sounds, such as leaf blowing encroaching from beyond the park borders.

Figure 3.03 Afforesting and reforesting at Tipton Meadow



The Tipton Meadow will also undergo several changes (Figure 3.03). I have chosen to clear several trees at the pond's southern end to encourage a denser growth of meadow grasses, which will help reinforce the banks of the Greenbriar Branch. Additionally, I propose restoring the man-made pond. While the Tipton pond was not a naturally occurring feature, it presents an opportunity to slow the flow of Greenbriar Creek further, capture particle load before it flows into the Potomac, and honor a site that was once, as landscape architect Randy Hester would describe, a 'sacred space': an area with a strong connection to the community, often recognizable only through local knowledge and experience (Hester, 2008). The restored pond will prioritize ecological function, and as a result, will not look the same as the original Tipton Pond. However, including a pond within the original basin allows the site to reconnect with the community's history while engaging current-day visitors.

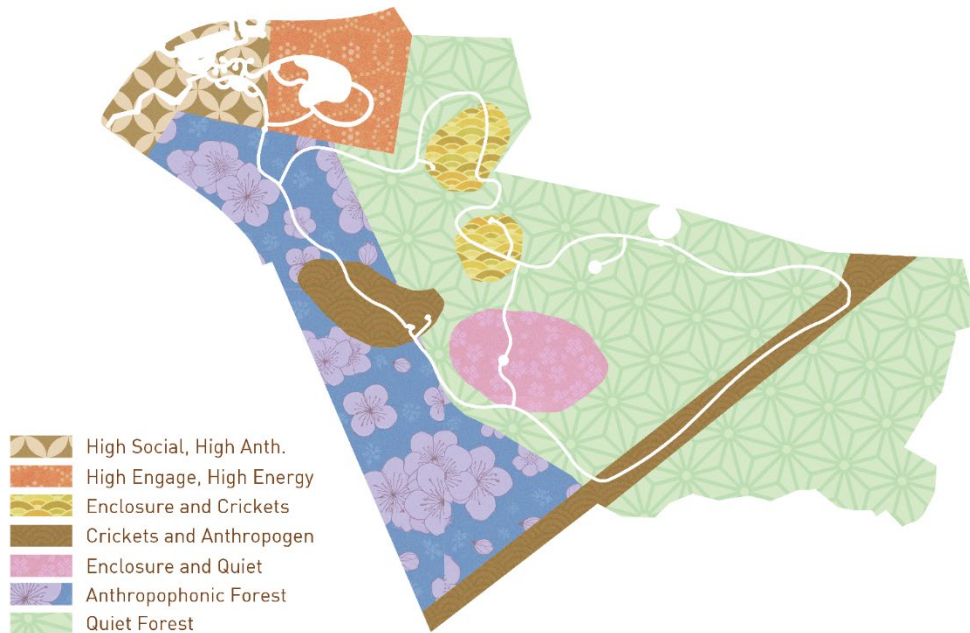
While the pond side of the meadow will be thinned, the Glen Road side will be planted with a dense new tree population. These will be smaller species that can handle the serpentine conditions. The smaller species allow for more trees to be

planted closer together and also bring the canopy level further down, creating a thicker and more effective screening against the sounds of traffic coming from the road.

Sensory Zoning

In alignment with Finnigan's (2023) recommendation, these changes create distinct sensory zones across the site (Figure 3.04). I have described the seven zones as: 1) high social engagement and high anthropogenic sensory input (shortened to "high anth." on the zone map), 2) high sensory engagement and high energy, 3) enclosure and crickets, 4) crickets and anthropogenic sensory input, 5) enclosure and quiet, 6) anthropophonic forest, and 7) quiet forest.

Figure 3.04 Sensory Zones of the Final Design



The *high social engagement and high anthropogenic sensory input* areas received high, complex levels of anthropogenic sensory input (largely sounds from and visibility of traffic) and are areas where visitors are highly likely to encounter and/or interact with other people. This zone does not emphasize sensory engagement but may have varying engagement opportunities (as well as sensory demands) during community events and busier periods. The *high sensory engagement and high energy area*, meanwhile, namely, the adventure loop, includes elements intended to engage all eight senses and sensory systems, including elements that pose physical challenges such as climbing structures and balance structures. Younger visitors may be more likely to travel through this area at higher speeds. On the opposite end of the sensory intensity spectrum, the *enclosure and crickets* zones are *Walled Garden* spaces well protected from anthropogenic sensory input. In the summer and autumn months, these spaces are noticeable for the steady cricket songs, which give the space a calming and safe atmosphere.

The *crickets and anthropogenic sensory input* zone is similar to the *crickets and enclosure*, but due to more permeable “walls” and closer proximity to anthropogenic sources, namely Glen Road and highly visible residential houses, this zone lacks the same protected atmosphere. They may have a slightly more active feel due to sensory intrusion from beyond the park boundaries. Nevertheless, these are still generally calm spaces. The *enclosure and quiet* zone shares the defined wall feeling of *enclosure and crickets* but does experience the intensity of summer insect songs. This zone is also shaded by canopy cover, although the canopy is thinner than in other areas of the forest. A quieter space, this zone provides a different kind of

peaceful atmosphere. The remaining part of the site is split into the final two zones. The *anthropophonics* (sounds from a human source) *forest* is characterized by less visual anthropogenic sensory intrusion, but noticeable traffic sounds from Glen Road, especially in Winter. On the other hand, *the quiet forest* has less auditory intrusion from Glen Road but may have much more visibility onto or into the surrounding private residential properties. I chose not to map areas with greenbrier patches as separate zones, as participants expressed more neutral reactions to this landscape than to the other archetypal landscapes.

Design Language

To create cohesions throughout the site, especially across the more built-up Glenstone properties and the lighter interventions within the conservation park, I repeated the use of natural wood and rough-cut stone, especially serpentine stone. However, when it came to the pathway and trail surface materials, I intentionally chose to use different materials within and outside the conservation area of the LSBCP. There are four trail materials used within the design (Figure 3.05). The first is the boardwalk that connects the Greenbriar Road intersection with the welcome area. This boardwalk varies in width as it zigzags through the forest, but it is never less than six feet wide and is typically wider than eight feet. The boardwalk uses entirely wood construction, other than the necessary hardware, to visually connect with styles more typically used in public parks while using atypical angles, height, and interactive elements to bring interest to the journey. In the welcome area and adventure loop area, the pathways are eight feet wide and constructed of stone dust in a darker shade. These paths meet ABA standards for wheelchair and mobility device

Figure 3.05 The four trail experiences



accessibility. They are lined with edges of lighter serpentine stone. This color contrast gives the pathways more visibility and distinction regardless of environmental conditions (see Figure 3.06 for a precedent example from the Skjervsfossen waterfall tourist location in Norway). Within the LSBCP, the trails are primarily natural surface. I propose lining the trails with branches to increase visibility throughout the year and discourage visitors from stepping off the path, which can cause trails to widen, increase disturbance areas that promote invasive plant growth, and increase erosion (see Figure 3.07 for a precedent example). Within the meadow areas, however, the trails utilize steel bar grating. As many of the meadowed areas tend to hold standing water, this would better protect the integrity of the soils while also

giving more space for the critical plant species to grow beneath the grating where there would otherwise be exposed earth.

I also developed two design languages for signage: informational signs, which should stand out and attract interest, and directional signs used at trail intersections. Both design languages utilize raised text and braille, which participants noted as important features on multiple occasions.

The informational signage follows the pattern of a PVC sign board mounted on a COR-TEN steel frame or pavilion wall (Figure 3.08). I designed four sign types that use this language pattern. The wall-mounted sign type is the largest and will be mounted on the inside wall of the pavilion near the restrooms and water fountain.

These signs give the overall context for the site, introducing the history and unique ecological and geological aspects of the park as well as sharing important information about the trails and spaces within the park and what information visitors can expect on the directional signage. The trailhead signs are the second-largest, with placements

Figure 3.06 Skjervsfossen waterfall access trail edge pattern, Norway

Source:

<https://landezine.com/skjervsfossen-by-ostengen-bergo-as/>



Figure 3.07 Trail edging at Dingle Woods in Aldridge, England

Source: [https://osmium-](https://osmium-tetroxyde.tumblr.com/post/53359286750)

[tetroxyde.tumblr.com/post/53359286750](https://osmium-tetroxyde.tumblr.com/post/53359286750)



Figure 3.08 Informational signage styles



at the main and Noble Court community trailhead. These are free-standing structures of the PVC board mounted onto CORE-TEN. The sign reaches the edges of the metal frame, so visitors will not worry about accidentally touching what may appear to be rust when reaching for the sign. This sign type also includes dramatic laser-cut and engraved extensions off the frame edge detailing some of the rare and threatened plant species that rely on the serpentine barrens ecosystem and animal species that make the park their home. Smaller signs along the trails also include these detailed extensions (Figure 3.09). These trailside signs help to interpret the history of the immediate area. I have designed two versions of this sign type: a thinner model, which will be used more frequently, and a

Figure 3.09 Close-up of the trailside signs



wider model, which will be used no more than twice, placed in areas that require the most contextual information. These trailside signs will coincide with regular benches every 100 – 200 yards along the trail. The final sign design occurs only at the Learning Deck beside the restored pond. These signs will be mounted onto the deck railing to interpret the community history and the ecological functions of the pond restoration and riffle and pool interventions. These are the only CORE-TEN mounted signs that will not include detail extensions on the frame.

The signboards use a charcoal background with white text and a combination

Figure 3.10 Example of a tactile map
Source: Adobe stock



Figure 3.11 Precedent example of tactile signage with high relief details from the Schöneberg Nature Park in Germany. Designed by Tactile Studio

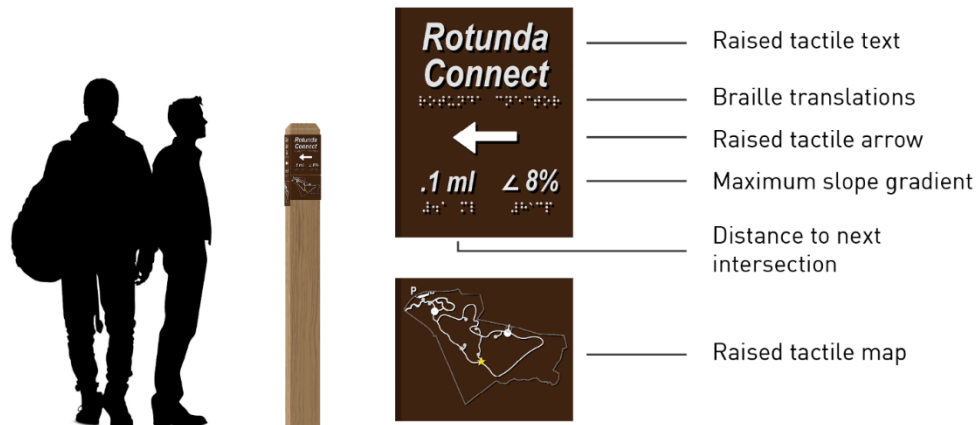


of monochrome and color images. The images, including the park maps, include three-dimensional texture for visual and tactile engagement (Figure 3.10). This is often specifically considered an accommodation method for blind and vision-impaired readers. However, during the sensory audit walks, my participants expressed interest in interacting with informational sign content through touch. The signs also include high-relief three-dimensional elements representing key educational elements (Figure 3.11). Neither the PVD board nor the CORE-TEN match the participants' frequent

mention of preference for naturalistic material. However, I noticed that none of the participants made associations between either the signage at Rachel Carson or the precedent example images I shared and this preference for natural appearance. Although it would be worth confirming this hypothesis before implementing these sign types, I have guessed that signage seems to be the exception to this rule. Participants did seem to react positively to signage types that interacted with the environment through cut-outs, high-relief 3D models as described earlier here, and viewing windows that add details to the landscape with linework images over clear glass or PVC. I chose to use CORE-TEN because the mottled brown will likely help the signs match the surrounding colors. The rusty appearance also visually links to some of the remnant features that I am leaving within the site to visually connect with the history of the space. This choice poses a risk; I did not think to discuss with my participants their likes or dislikes of “ruins,” and I have not had the chance to solicit participants' reactions to this choice. However, during the sensory audit walk, we passed a rowboat paradoxically stored in the woods high above the stream (itself too small a body of water for boats). Some participants remarked on the boat, and rather than criticize its existence, these participants spent some time debating its origins. I take this as evidence that “ruins,” or unexpected abandoned remnants of past human use, do not conflict with the desire for natural materials.

I modeled the directional signs, used at trail and pathways intersections both within the LSBCP proper and within the Glenstone-owned trailhead site, after the signage present at the Rachel Carson Conservation Park: a simple wooden post bearing brown placards with white text (Figure 3.12). Participants seemed to react

Figure 3.12 Directional Signage



positively to this signage model. At the very least, I received no feedback that they found the visual appearance unappealing. This style also has the benefit of visually connecting with styles typically used at other natural resource parks, reinforcing the importance of the natural features within the LSBBP, and blending well with the environment. The white text makes this style easily readable, but the simple design is not so visually “loud” that the signage distracts attention from the landscape. Based on participant feedback, I have added tactile text, braille, distance to the next intersection, and an indication of the maximum slope visitors will encounter on the next section of trail. An explanation of how to interpret these signs will be included on the signage within the pavilion. I have also added simplified tactile trail maps to each side of the post, which indicate the parking area with a “P” and the current location with a star. However, I should note that further feedback, especially from blind and vision-impaired hikers, will be needed to confirm whether a star is the best shape to use in this instance, as it may not translate well to touch-based communication.

In place of the maximum slope indicator that I chose, a future version of this design may consider establishing a ranking system similar to the spoon ratings used by the organization Disabled Hikers (n.d.). This system considers a range of factors, of which slope is only one, to communicate the level of effort disabled hikers can expect the trail to take. The “spoon” draws from spoon theory, a metaphor for the energy requirements and consequences for people with chronic pain, which has since been adopted by the broader disabled community (Mobility International USA, n.d.). Disabled Hikers has established a very specific rating system that is likely their intellectual property. It is intended to rate trails that range from conditions similar to the LSBCP to the Rocky Mountains, and subsequently, many aspects that factor into this rating system are not relevant to the LSBCP. A more specific system may need to be developed for the LSBCP and explained on the Pavilion signage.

Edges and Access

Sound and visibility screening posed a significant challenge for this site. During my site visits, I found the proximity of the residential properties uncomfortable, particularly in winter. As mentioned in the previous chapter, this influenced the trail route. Although I initially planned to place the trail east of the PEPCO right-of-way, the visibility in that section led me to avoid it in the final design. Whenever I included a stopping point along the trail within view of the residential edges, I positioned visitors to face away from the buildings. I utilized barriers or changes in topography to prevent the feeling of being watched from the residential properties or other points along the trail.

The traffic noise from Glen Road presented a more substantial issue. While I considered planting evergreens along the road for natural screening, I ultimately decided against it, as this could negatively impact the ecosystem. After further consideration, I decided to install a fence along Glen Road. While this does alter the rustic aesthetic for drivers and disconnects the park from passersby, I propose a custom fence made from natural materials and artistic forms that won't distract drivers (see Figure 3.13 for a precedent example). The fence would feature panels with varying gap sizes, allowing for greater visibility in some areas while providing better sound screening in others. In particular, it would offer more screening along the stretch of Glen Road from Tipton Meadow to the Greenbriar Road intersection.

The bespoke design could also serve as a landmark, helping drivers anticipate both the LSBCP trailhead and the nearby Glenstone Museum entrance. Additionally,

Figure 3.13 Artistic bespoke fence designed by Sheet/RockLA
Source: www.dezeen.com



Figure 3.14 The updated Glen Road and Greenbriar Road intersection prioritizes safety



the fence may reduce deer crossings along the curve of Glen Road, improving driver safety. If the deer population threatens the serpentine barrens ecology, the fence could eventually extend along the entire perimeter to deter or prevent deer from entering.

Finally, I considered the experience of approaching and entering the park. As discussed in the previous chapter, I propose a connecting path that links the Glenstone bus stop with the park site, crossing Glen Road on the east side of the intersection with Greenbriar Road. This crossing location reduces the number of streets visitors need to cross. I have also introduced a speed table with clearly painted warnings for oncoming drivers (Figure 3.14). This crossing will require ample signage, as it is unique along Glen Road, and new drivers may not expect it. The speed table is a strong deterrent against speeding through the intersection, making it safer for pedestrians and drivers. It may also assist drivers turning from Greenbriar Road onto

Glen Road, as the nearby curve and the speed at which drivers approach can make this turn unnerving. Both residents and visitors will benefit from this intervention."

Although I did not focus extensively on welcome signage, the design does include an entrance marker for the Lower Serpentine Barrens Conservation Park. This will be represented by CORE-TEN lettering on the pavilion wall facing the parking lot entrance (Figure 3.15). The sign will likely need to include the park's name and a reference to the Glenstone Museum. While I did not develop additional roadside signage for the Glen Road intersection or near the Greenbriar parking lot entrance, future designs should address this need. Figure 3.16 includes a conceptual sketch from my first project related to this site during my 2023 Construction Methods course.

Figure 3.15 Entrance Marker on outer Pavilion wall

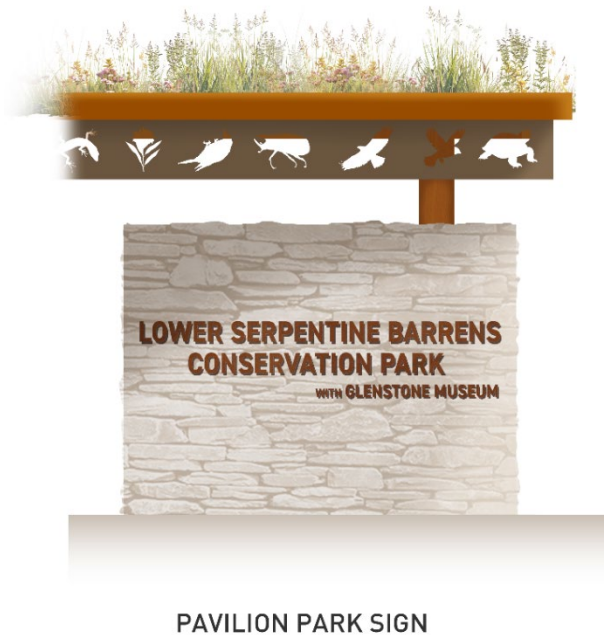


Figure 3.16 2023 draft concept sketch for roadside design using lettering on naturalistic rock "outcrop"



Since this design still largely fits the aesthetic language I used for the site (except for the pine tree, which should be replaced with another plant type), I recommend using a similar style.

The objectives, sensory zoning, and design languages also influenced the more detailed elements of this design. In the next two sections, I will take a closer look at the design for the current and future Glenstone properties and then at the design within the LSBCP.

Arts and Engagement in the Stage 1 Glenstone Trailhead Area

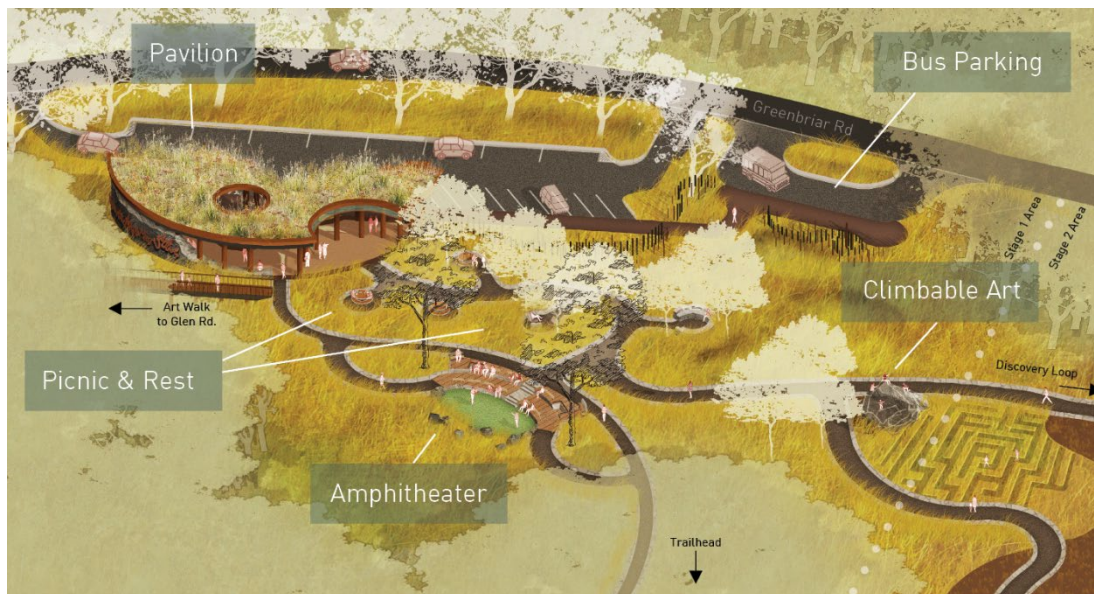


Figure 3.17 The Welcome Center orients visitors, hosts events, and creates social arenas

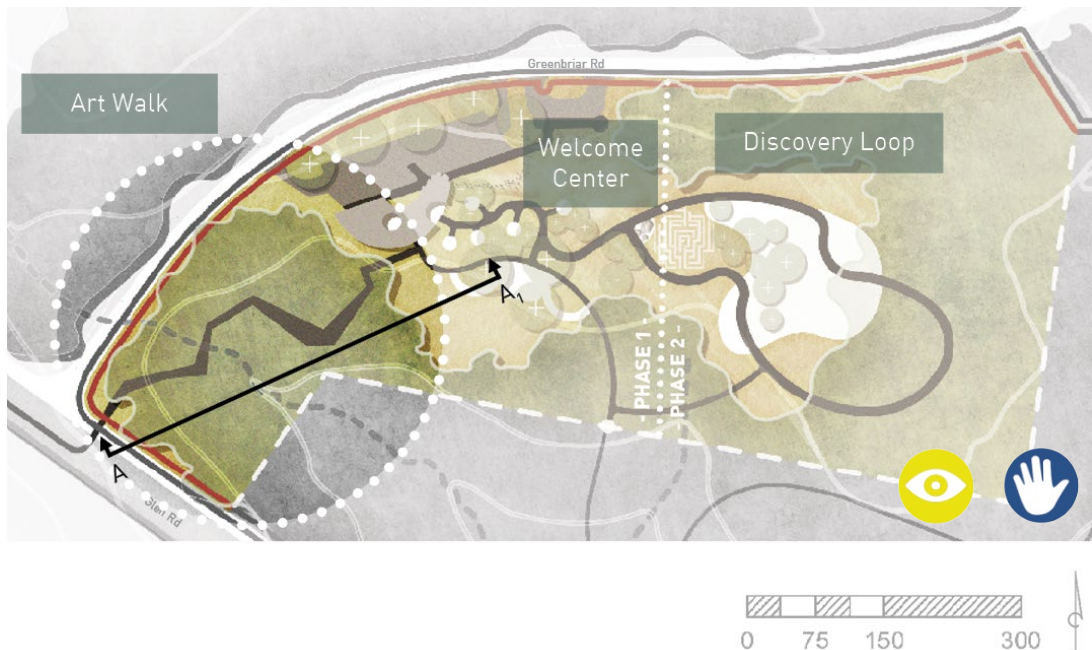
The two Glenstone properties—current and future—will serve as the primary entry point for most visitors to the park. The majority of the design for this area will be implemented during the first stage, which includes the construction of the art boardwalk linking the Glen Road crossing to the Welcome Center and the Welcome

Center itself. The Welcome Center will feature parking, a welcome and learning pavilion, a picnic and rest area, an amphitheater, and a climbable art installation (Figure 3.17).

Drama and Imagination Along the Art Walk

The Art Walk serves as a connection to guide visitors from the Glen Road crosswalk to the Welcome Center (Figure 3.18). The walk takes the form of a conventional natural park boardwalk for the first thirty-five feet. Visitors will likely

Figure 3.18 The Art Walk combines interactive sculpture and storytelling



Art Walk Section A-A₁



find the wide wooden railings and narrow cross boards familiar from visits to other regional parks. However, they will soon realize that this boardwalk and the conservation park it leads to take a different approach than the norm. The boardwalk takes the first turn at a jaunty angle, briefly expanding the original nine-foot width to a roomy thirteen feet. Halfway to the next turn, the walk has again narrowed to nine feet. When the visitor reaches the upcoming turn, it returns to a thirteen-foot width. The walk continues in this fashion, widening and narrowing at unexpected angles as it zigzags between the straight columns of the trees. Meanwhile, it has also begun to rise at a gentle two-percent slope, levelling out again at every turn. It reaches its crux after ninety-seven yards, having risen less than seven feet, yet visitors find themselves nearly within the forest canopy. What magic has bridged this difference in height? While the boardwalk rose, the ground beneath it fell, forming a valley that marks the head of an ephemeral stream. This change in topography lowers the forest canopy, allowing human and arboreal spheres to meet. Past this point of joining, the boardwalk takes a slightly more moderate downslope of no more than four percent to emerge at the Welcome Center.

Along the way, the boardwalk uses tactile sculptures crafted from natural materials (Figure 3.19) and interactive panels inlaid into the railing (Figure 3.20) containing snippets of stories, poetry, music, and images to tell the precolonial and prehistoric stories of the surrounding landscape. Wayfarers may allow their curiosity and a multitude of senses to draw them along a journey through precolonial fire-managed meadows, where ancient megafauna grazed among the once-towering

Figure 3.19 The WildWoods elevated boardwalk at Atlanta, GA's Fernbank Museum of Natural History includes wooden structures reminiscent of tulip poplar flowers

Photo by Timothy Hursley.
landscapearchitecturemagazine.org



Figure 3.20 Landscape Architecture Lab designed a short boardwalk in the Iława Forest in Poland to include interactive panels in the rail cap.

Photo by Aleksandra Matyas
landezine.com

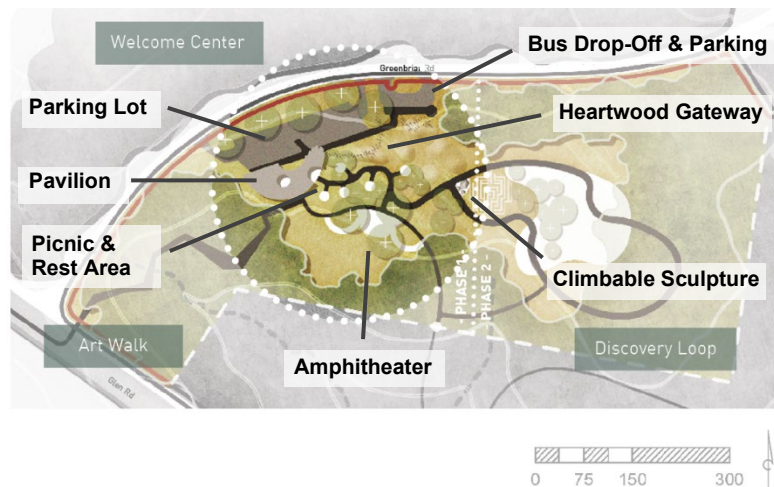


heights of the Appalachian range, and the primordial seas that created the rocks now peeking through the surface soil.

Forms and Materials Establishing Place

Visitors arriving by car pass over a small stone bridge as they enter the parking lot. Already, the park has begun to reinforce themes of forest, water, and stone. The first thing visitors arriving see will be the Pavilion, its serpentinite outer wall of roughly hewn rocks calling to be touched and examined. As visitors emerge from their vehicles, they may smell the earthy, sweet aroma of the sun-warmed meadow grasses surrounding the lot, extending along rolling undulations further into the Welcome Center. Near the roadside swale, water-loving trees like Eastern cottonwood (*Populus deltoides*) and river birch (*Betula nigra*) provide a restless, dappling shade as over the permeable pavers and parked vehicles as their leaves twist and flicker in the breeze.

Figure 3.21 Visitors are introduced to the park at the Welcome Center



Buses delivering school groups arrive at a separate lot. As students disembark, they are met by a winding procession of upright heartwood logs that coil through the landscape (Figure 3.22 – 3.23) from the bus drop-off area to the Pavilion. These logs have retained much of their organic forms; their silhouettes bulge with the joints of former boughs and branches. They have been sourced from the cleared invasive pines inside the conservation park and from necessary felling conducted at other Glenstone and M-NCPPC locations. Their bark and sapwood have been peeled away, and many

Figure 3.22 The view from the parking lot creates a clear visual boundary between the naturogenic interior and the anthropogenic exterior.

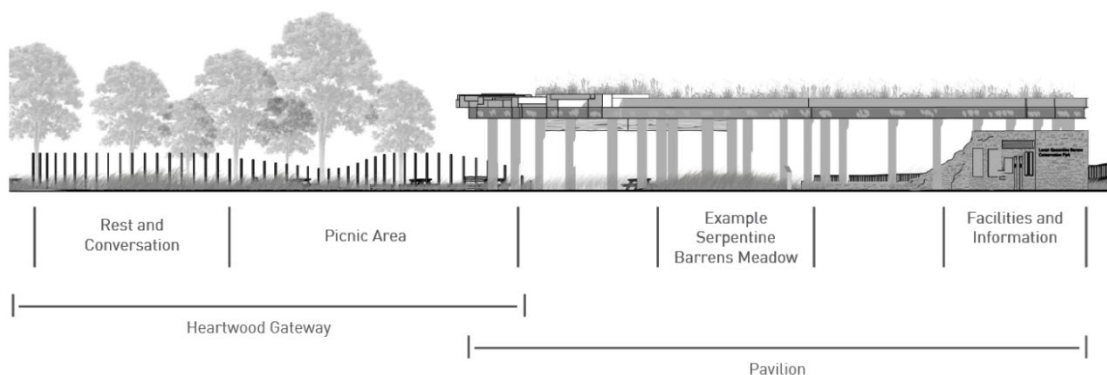


Figure 3.23 The line of painted and unpainted reclaimed “trees” meanders along the borders of the Welcome Center, creating a heartwood gateway.

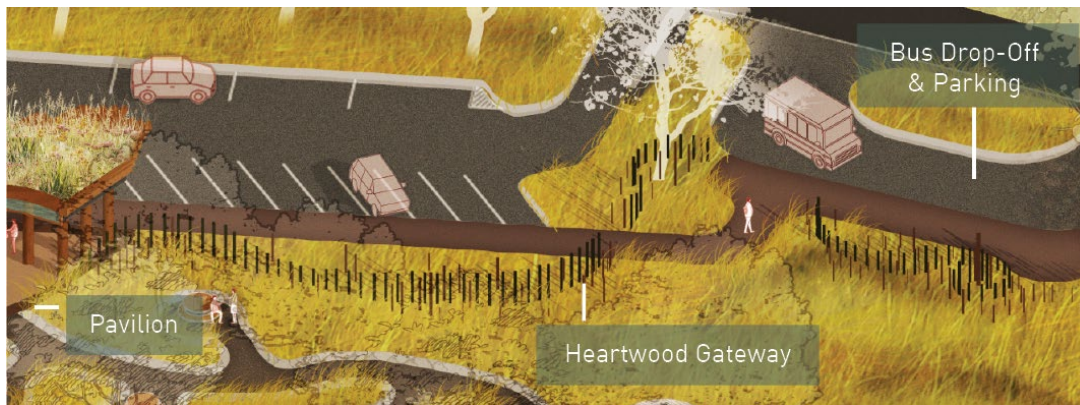


Figure 3.24 Viewed from a certain angle, unpainted, raw heartwood poles used for delineating space and protecting young trees at the Parc du Grand Pré in France appears to create a deadwood forest.

Photo © Agence Laure Planchais. laureplanchais.fr



Figure 3.25 Although crafted from glass, Dale Chihuly’s *Red Reeds* installation bridges natural and human realms, as well as inspiring the sinuous path of the Heartwood Gateway.

“Chihuly glass sculpture at the Meijer Gardens in Grand Rapids” by MollySVH. Licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/). Image cropped. [Flickr.com](https://www.flickr.com/photos/mollysvh/)

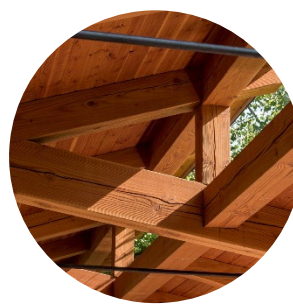


of these sentinels have been left unprimed and unpainted to give home to birds and bugs, eventually fated to rot away and be replaced (Figure 3.24). Many others have been painted with a warm yellow hue that melds with the surrounding meadow even in summer green, while broadcasting their anthropogenic transformations (Figure 3.25). This sinuous line marks the transition between the outer anthropogenic world and the inner naturogenic world, a visual representation of the melding of both along the liminal line. By marking the boundary, the painted and unpainted logs facilitate an easing into the transition, something a few of my research participants discussed at length during the last stop of the sensory audit walk. In this design, students and their chaperones must pass through a gap in this procession, leaving that outer world behind, as they step into the Pavilion.

Pavilion Embodying the Barrens Woodland Landscape

The Pavilion first introduces visitors to the Travilah Serpentine Barrens through its use of materials. Much of its construction uses warm wood (Figure 3.26), including the pillars that stand like the trunks of the surrounding forest. Rather than a canopy of oak leaves, this forest sports a canopy of grasses and wildflowers. The green roof slows stormwater runoff rates while visually continuing the surrounding

Figure 3.26 *Left:* Warm wood gives the feeling of being enveloped by the forest. *Right:* Blending a building into the landscape with a meadow roof.



© New Energy Works.
newenergyworks.com



Design by WillemsenU.
Dezeen.com

Figure 3.27 *Left:* The eponymous petals of the great fringed gentian. *Right:* Builders in Sweden achieve a similar frilled edge for a roof.



© Arthur Haine.
nativeplanttrust.org



© Arknat. svenskttra.se

meadow context onto the building itself (Figure 3.26).

The shape of the roof also takes inspiration from flora specific to the serpentine barrens. At the northeastern edge, wooden beams jut out over the walkway, creating a rough, jagged edge

reminiscent of the frilled petals of the great fringed gentian (*Gentianopsis crinita*) (Figure 3.27). A decorative metal frieze with stamped silhouettes showcases the many plants and animals that live within the serpentine barrens. Visitors may test their identification skills before and after reading the informational signs along the park trails (Figure 3.28).

Figure 3.28: Informational signage works in tandem with materials and symbols to engage visitors in a deeper learning about the unique park.



On the ground level, the pavilion nestles into the meadow. The building curls around an uncovered teardrop-shaped atrium along its northern side, where a mounded patch of grasses and wildflowers introduces visitors to the specific plants that thrive in the park's punishing serpentine soils. A circular open gap in the ceiling of the western half of the pavilion allows rain to fall upon a ceramic disc set into the pavilion floor. Low relief carvings in the ceramic represent the Greenbriar Branch and Watts Branch watersheds and direct the rainwater to drainage grates that line the disc's outer edge. These grates and downspouts from the roof channel rainwater into a detention tank located beneath the pavilion in the space previously carved from the bedrock when it served as the basement for the former residential house. A ring of bricks encircles the ceramic disc and drainage grates. These bricks, contrasting in color and texture with the surrounding pavers, serve multiple roles. They warn white cane users and vision-impaired visitors about the change in materials and the open ceiling to prevent trips or accidental drenching. They also include bricks from the Tipton and Weihe remnant sites, memorializing recent history and the Travilah community itself (Figure 3.29).

The walled portion of the Pavilion along the western edge showcases the varied hues and textures of the serpentinite rock. This area contains public restrooms, a water fountain, and abundant information about the conservation park, the partnership with Glenstone Museum, and the unique and rare aspects of the Travilah Serpentine Barrens ecosystem. The structure appears to crumble at the edge of the educational signs, as if weathered by age. Yet the walls soon smooth again, albeit

Figure 3.29: The etched floor detail and open roof act as an artful rainwater element, sensorially engaging visitors in all weather.

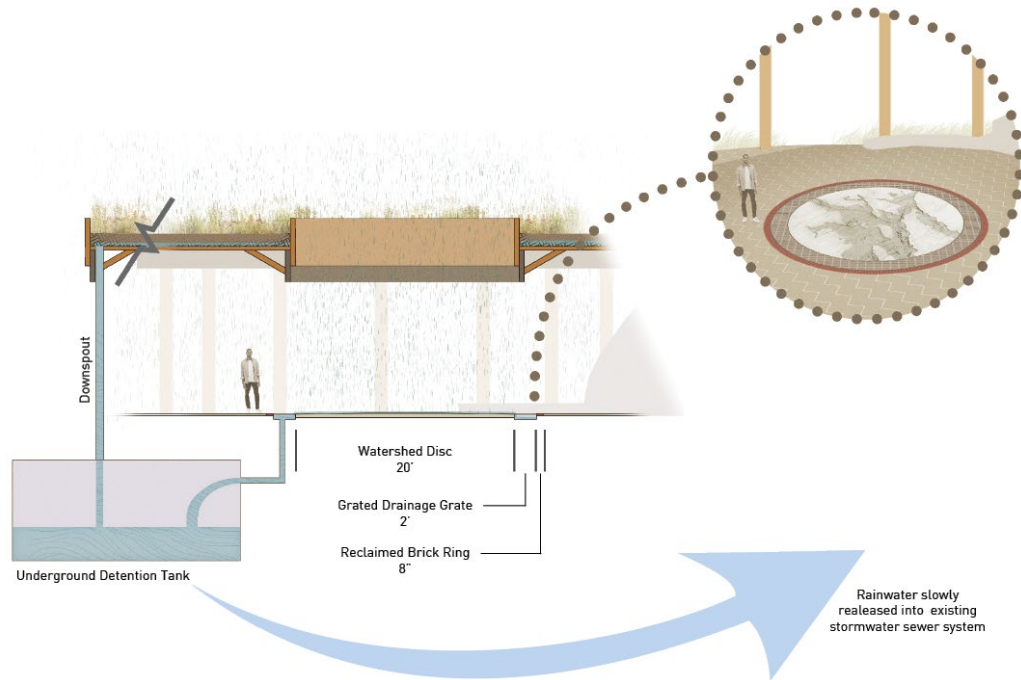


Figure 3.30: The stone wall drops away to create an open view of the meadowed Welcome Center and beyond it, the forest edge, inviting visitors further into the park.



much shorter and narrower than before, to become a bench for visitors to sit upon (Figure 3.30).

Most of the pavilion remains open, creating an ideal space for community events. Tables and activities can be arranged flexibly within the pavilion to meet the specific needs of each event, whether it be an art-making festival or a celebration of the annual return of migrating birds.

Picnics and Relaxation Among the Meadow Grasses



Figure 3.31: The picnic and rest area is a great place to both start and end a visit, providing space to socialize as well as contemplate.

Two paths lead visitors away from the pavilion. Take the one to the east, and it winds gently through tall grasses, guiding perambulators along a coiled route. Here and there along the way, spurs extend from the path to circular clearings (Figure 3.31). The three closest to the pavilion feature round picnic tables. These picnic tables are unique. Each section of the bench surrounding the table can be individually raised to create a wheelchair-accessible spot, allowing visitors to customize their experience and seating arrangements (Figure 3.32). The warm woods of the table and benches

create a visual and tactile connection between families, friends, solo lunchtime park diners, and the surrounding nature. These picnic areas may also serve as activity stations during community events, extending art and learning beyond the pavilion and into the landscape.

The other two clearings offer different areas for rest. The clearing farthest from the pavilion features a simple stone sitting wall that follows the circumference of the clearing. The back of the wall is built up further to provide a backrest.

The final clearing features a conference of clustered stones arranged to create three comfortable lounging chairs. The lower position of these chairs allows visitors to feel, in the words of one research participant, cradled by the grasses. Throughout the picnic and rest area, smaller trees such as hawthorns and hornbeams provide pockets of cooling shade to the clearings and pathways during the warmer months. The rustle of their leaves helps soften intrusive sounds.

Intimate Amphitheater with Comfort and Access in Mind

A short path connected to the southern exit of the Pavilion leads visitors to the amphitheater (Figure 3.33). This amphitheater seats a maximum of about fifty audience members. Although it may be too small for the full theater productions described by some research participants, it is well-suited for educational programs,

Figure 3.32 Companies such as Extremis offer adaptable picnic tables with benches that adjust to various heights

Photo © Extremis. Extremis.com



Figure 3.33 The amphitheater is a place to teach and entertain students, community members, and Glenstone Museum visitors.



small music performances, and limited cast plays. There are three levels with two seating ledges accessed from both a center stairway and sloped paths, along with additional benches on the top level. Backrests along each edge provide comfort during longer performances and protect mobility-device users and blind or vision-impaired visitors from the edge. The middle level includes recessed spaces cut into the seating wall, allowing wheelchair and scooter users to sit alongside friends and family.

Like the pavilion, the amphitheater echoes the material themes of the Travilah serpentine barrens. The retaining walls are constructed from rough-hewn serpentine stone. Over time and exposure to the elements, these stone surfaces will hopefully cultivate communities of lichens, such as those often found on the rock outcroppings throughout the park. The seating and walking spaces are topped with warm wood decking, providing a comfortable seating experience. The performance area consists of mown grass or a no-mow species of *Carex*. Two broad-canopied maple (*Acer* sp.)

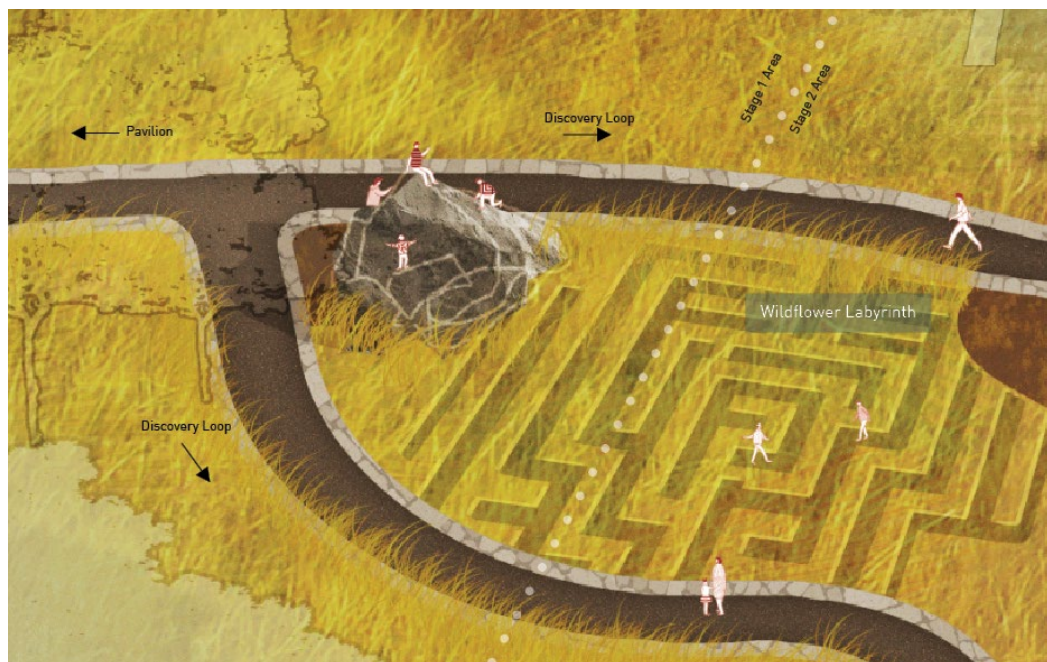
trees flank the amphitheater, offering shade for audience members during the hottest afternoon sun.

Climbing Boulders and Tactile, Interactive Art

The *Massif* archetypal landscape was the most resoundingly popular of the nine stops along the sensory audit walks. Many participants later reiterated their praise for the boulder outcrop during the design workshop. Others expressed a desire for spaces that similarly challenged the body with proposals for climbing structures constructed with ropes, netting, ladders, and even the living trunks and branches of trees.

In response to this unambiguous feedback, the Welcome Center includes a cluster of large boulders at the head of the discovery loop that can be touched, climbed upon, explored, and lounged upon. This spot, nestled within the fork of the

Figure 3.34: The exact design of the climbable boulder art installation will be determined in collaboration with the artist



path, is located within the first stage of the design (Figure 3.34). Before implementing the Stage 2 expansion, a spur path will connect the picnic and amphitheater areas to the boulders. During the installation of the discovery loop in the second stage of the design, this spur trail will branch around the boulders and continue to form the loop path.

Ideally, these boulders will serve as a space for physical enrichment and an interactive art installation that encourages full-body engagement to explore artistic intent. Boulders are a somewhat uncommon material for art installations, likely due to the cost of sourcing and transporting multi-ton masses of stone. However, boulders and boulder-like forms have been installed to great effect in both museums and urban landscapes. Often, these installations distance the viewer from the rock, minimizing tactile opportunities. One such example is

Michael Heizer's *Levitated Mass*, installed in 2012 at the Los Angeles County Museum of Art. *Levitated Mass* suspends a 340-ton and roughly 20-foot boulder fifty feet above visitors' heads, exploring perceptions of size, gravity, and weight (Figure 3.35).

A more extreme example is *Inverted Portal* by Ensamble Studio, which was installed at the Tippet Rise Art Center in Fishtail, Montana, in 2016. In

Figure 3.35 *Levitated Mass* by Michael Heizer
© Michael Heizer gagosian.com



Figure 3.36 *Inverted Portal*
by Ensamble Studio
Photo by Iwan Baan. [slate.com](https://www.slate.com)



Figure 3.37 *Rocks on Wheels* by Mike Hewson
Photo by Mike Hewson. [Dezeen.com](https://www.dezeen.com)



Inverted Portal, two towering, 40-foot-tall boulder-like forms appear to support each other's weight as they stand precariously on one end in the open Western foothills (Figure 3.36). Unlike *Levitated Mass*, visitors to the Tippet Rise Art Center are meant to view *Inverted Portal* from both afar and up close; a walking trail brings visitors within touching distance of the sculpture. Proximity breaks the illusion of stone, revealing the forms to be constructed of concrete. The impact of *Inverted Portal* arises not only from the size or material of the sculpture but also from the many ways the piece contrasts with and complements the surrounding natural landscape. On a much smaller scale, the climbable art installation within the LSBCEP Welcome Center should similarly engage with the natural elements of its contextual landscape.

More recently, in 2023, artist Mike Hewson designed a public playground for the City of Melbourne, aptly named *Rocks on Wheels* (Figure 3.37). Hewson's piece humorously creates the illusion of numerous hulking boulders precariously balanced on furniture dollies. Although safety was a central concern in Hewson's design, the boulders are, in fact, well secured in place. Climbing and play equipment sprout from

and interconnect the boulders to form a complete interactive jungle gym. *Rocks on Wheels* is an excellent example of fully interactive boulder art that links the physical qualities of natural stone boulders with playful interaction and artistic expression.

A Park for Slow Movement and Tranquility (Stage 1)

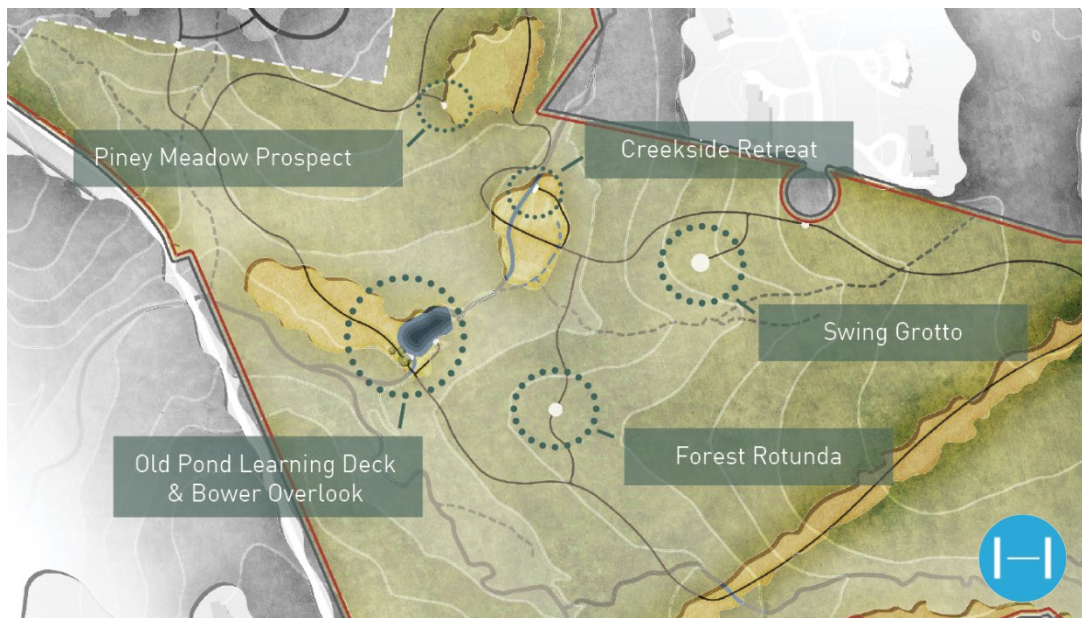


Figure 3.38: The research participants’ responses during the audit walks and ideas shared during the design workshop directly led to a series of trail niches within the park.

The conservation area of the LSBCP, which represents the land owned and managed by M-NCPPC, has greater constraints on the intensity and type of design features. The large-scale features included in the Welcome Center would cause irreparable harm to the fragile barrens ecosystem within the park proper. In response, I developed a set of smaller site interventions, which I have called niches. These niches are moments of pause, encouraging visitors to engage more deeply with their immediate surroundings, and are located at locations that are significant representations of the archetypal landscapes. There are six niches: two alongside the

restored Tipton Pond, one in a forest glade, one within the open forest, one along the Greenbrier Branch, and one at a meadow edge. All but two of these niches are separated from the main trail by a spur path.

The niches facilitate deep connection to the park's unique landscapes through avenues of learning and appreciation, employing various degrees of energy/movement, stillness, and tactile connection. Similar to the Welcome Center, elements within the niches primarily utilize stone and wood materiality, taking advantage of raw, less processed forms of the materials to blend structures into the landscape. Limited uses of less naturalistic materials, such as metal, maintain minimalist forms and darker colors to visually recede into their surroundings. The living surroundings also take a much more active role as material elements; many niches borrow the straight trunks of the trees as columns and the canopies as ceilings, or copses of uncleared evergreens as walls to form sylvan rooms. Each niche plays with aspects of enclosure and prospect in dialogue with the distinctive microhabitat that shaped its placement.

A Duality of Learning and Observing at the Tipton Pond

Visitors walking counter-clockwise along the main looped park trail will first encounter the two niches on the banks of the restored Tipton Pond, the Learning Deck, and the Pondsides Arbor (Figure 3.39). Trail journeyers will first encounter the Learning Deck, with the trail passing through the niche. The deck stands upon the foundations of the original pond's levee wall. A semi-rectangular space, this niche orients visitors' attention in a full 360 degrees with informational signs mounted along the railings. This niche sits at a unique confluence of significance; it straddles

Figure 3.39 The two niches along the restored Tipton Pond give opportunities to the history and the ecology of the park through multi-sensory learning and through quiet observation.



the most significant body of water and the largest meadow within the LSBCP and is the site of a significant former community “sacred space.” The signs will explore the interplay between these forces and how the changing forms and uses of the land have influenced the types of plant and animal species that live within the park. A bench at the center of the niche allows readers to rest their feet while gazing out over the meadow, pond, or nearby forest edge. A specimen serpentinite boulder sits at the center of the bench, both as an opportunity to touch and explore the mineral and to lean back and rest one’s back.

Cross a bridge over the creek past where the pond walls allow the waters to spill down tiered steps of riffles and pools, and visitors will come to an intersection in the trail. To the left, a spur trail draws travelers a short 80-foot distance to where the forest canopy reaches the water’s edge. There, among the grasses and sparse understory brush, what initially appears to be two irregular ricks of square-cut logs transforms into a quiet arbor overlooking the cattails and calm waters. The angled and

stacked logs create comfortable seating for long contemplation of the shimmering water surface and form a partial screen blocking direct visibility to and from the Learning Deck. By sitting on one side or the other, visitors may choose whether they prefer to enjoy the space without worrying about being observed or whether they wish to people-watch the activity on the Learning Deck.

A wooden platform echoes the pattern and material used for the Learning Deck and acts as flooring between the two seating wings. In response to numerous participants wishing they had access to touch the creek water during the audit walks, the platform advances slightly over the water's edge. Visitors may kneel at the deck edge to dip their fingers into the water or admire the soft fuzz of a nearby autumn cattail. Park educators may also use this space to access the water for educational demonstrations during tours through the park. A trip rail at the platform's edge keeps people and property from inadvertently spilling off the platform edge.

Quietude and Gentle Movement within the *Nave* forests

A bit further down the main path, walkers will encounter another intersection. This connecting path cuts from one side of the outer loop to the other, allowing for a shorter trail experience. On the way, it passes through an area where the trees suddenly thin. The greenbriars, which tangle the surrounding area, fall away, revealing broader patches of rock outcrops peaking above the soil. The space feels open and light. It is ringed a short distance away by patches of evergreen groves, defining the edges of the space and creating a sense of quiet enclosure. At the center of this space, the path connects with an unassuming perch, a curved circle bench fifteen feet wide at the center, constructed simply of a wooden seat on stone supports.

Around the bench, the trees stand like columns, supporting a laced canopy. This loosely woven ceiling dapples the scene with swaying sunlit patches that warm the wood seat of the bench and the shoulders of anyone sitting there. This is the Forest Rotunda (Figure 3.40). The modest seating entices wayfarers to pause and take in the numinous atmosphere.

Figure 3.40 The tranquil forest rotunda uses minimal intervention to allow visitors a moment of stillness in the natural glade.



The spot I described (minus the proposed bench) is a location I found during one of my site visits. The combined effect of the shallower soils opening the forest and the evergreen screen on most sides gave me an immediate feeling of sanctuary. I wanted to honor the space without distracting from its innate atmosphere. Nature had already built the rotunda; I intended to give visitors a way to enjoy it. I drew from a comment one participant made during the *Nave* landscape stop during the audit walk.

This participant mentioned desiring a space to lie down and watch the dappled sunlight. I included a simple circle bench as the continuous length allows visitors to choose whether to sit or lie upon it. Since this is not intended to be a space that encourages an influx disruptive sounds, I designed this bench to have a wide diameter that would make conversations more awkward for more than a pair of conversants, making it better suited for small, intimate conversations and allowing ample room for visitors to space themselves apart from each other. Visitors may sit on the bench facing towards the center or outward, or, when lying down, may gaze up into the tree canopy. I felt that allowing visitors to experience the space on their own terms without forcing their attention in one specific direction was important. The Forest Rotunda is the most protected from encroaching sounds and sightlines out of the six niches. It is a space that soothes the senses and slows the mind.

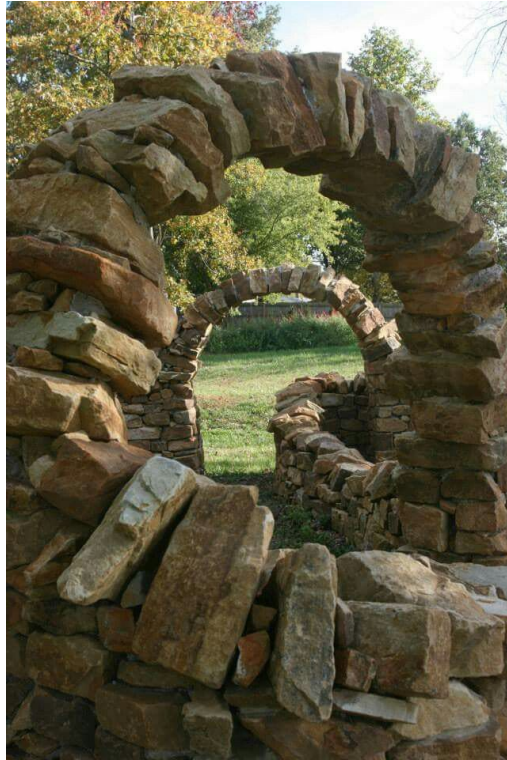
Continue along the path, and not far from where the shortcut trail reconnects with the outer loop, another spur trail draws visitors down a gentle wooded slope. At its terminus, the trail meets an open archway within a twining stone wall. The wall reaches no more than ten to fifteen feet to either side. The rough stones and mortarless construction give the archway the appearance of having just risen from the soil to mark the pathway's end. Beyond the archway, a drift of five swings winds for a brief distance between the trunks. Their clean lines and dark colored frames help the swings blend into the landscape. This area is the Swing Grotto (Figure 3.41). The swings offer a space of gentle movement, a feature repeatedly requested by research participants, and a vantage to look out over the rolling slopes of this park section. This section of the forest is almost completely clear of greenbriar, and viewers can

Figure 3.41 The swing grotto takes a light touch approach, defining the space only with a primitive, yet fluid stone arch entrance and a scattering of discreet, clean-lined swings.

Left: Likely Rock Wall at Mandala Gardens in Marion, Illinois. Photographer unknown.

[Pinterest.com](https://www.pinterest.com)

Right: the Ilawa Forest in Poland, designed by Landscape Architecture Lab. Photo by Aleksandra Matyas. landezine.com



see far into the park's depths. This location does have some visibility to the residential edges, so the swings use the ground slope to angle viewers' attention away from this direction.

Prospect and Refuge along Edges in the *Walled Garden* Meadows

As walkers continue back toward the Welcome Center along the loop trail, the path suddenly emerges from the woods into a sunny meadow clearing. A spur trail connecting to the right at this threshold hugs the forest line for a distance before changing direction to cut toward the meadow's center. It ends in a small, grated

platform at the edge of the Greenbrier Branch creek, known as the Creekside Retreat (Figure 3.42). The platform supports a single bench constructed from a half log cradled in stone supports with a thin stone backrest. Sitting on the bench surrounds the visitor with the gentle chorus of crickets, the gurgling of the creek, and the humid heat from the grasses. The stone back warms in the sun, which is especially welcomed during the cooler seasons. Pollinators, dragonflies, and grasshoppers provide glimpses of buzzing movement, while farther away, meadow sparrows pop in and out of the grasses in search of food. Like Pondside Arbor, this niche provides a connection to the water. A flat boulder creates a bridge between the platform and the creek. Visitors may sit or recline upon it and dip their fingertips into the shallow ripples.

Figure 3.42 The Creekside Retreat surrounds visitors with the humid fragrance of the meadow grasses and the chorus of crickets



Perambulists must pass through a third meadow before reaching the spur trail leading to the final niche. As the spur trail reaches the meadow's edge, it concludes at a low, rustic bench just within the canopy line: merely a thick wooden beam resting between two stony shoulders set into the soil to create the appearance of natural outcrops. This spot is the Piney Meadow Prospect, (Figure 3.43) an unassuming place to gaze out over the meadow. The meadow has a dense presence of pines around its edges, giving it well-defined margins and a strong sense of enclosure. The Prospect overlooks the longest stretch of the longest axis of the pocket meadow, providing a greater sense of distance. Like at the Creekside Retreat, lingering guests absorb the cricket melodies and observe the playful antics of birds feasting on grasshoppers and other grassland bugs, but here the low stature of the seating and the canopy overhang offer a sense of hidden refuge from which to view. Visitors may watch in amusement as other walkers follow the path they had taken a short time earlier through the meadow's far end, feeling assured that they are unlikely to be spotted in return. This Niche is also the simplest construction, using no more than two rocks and a single length of lumber, to blend the space into the natural setting. It is a quiet, contemplative end to the day's visit, providing roamers with a final moment of restoration before returning to the trailhead.

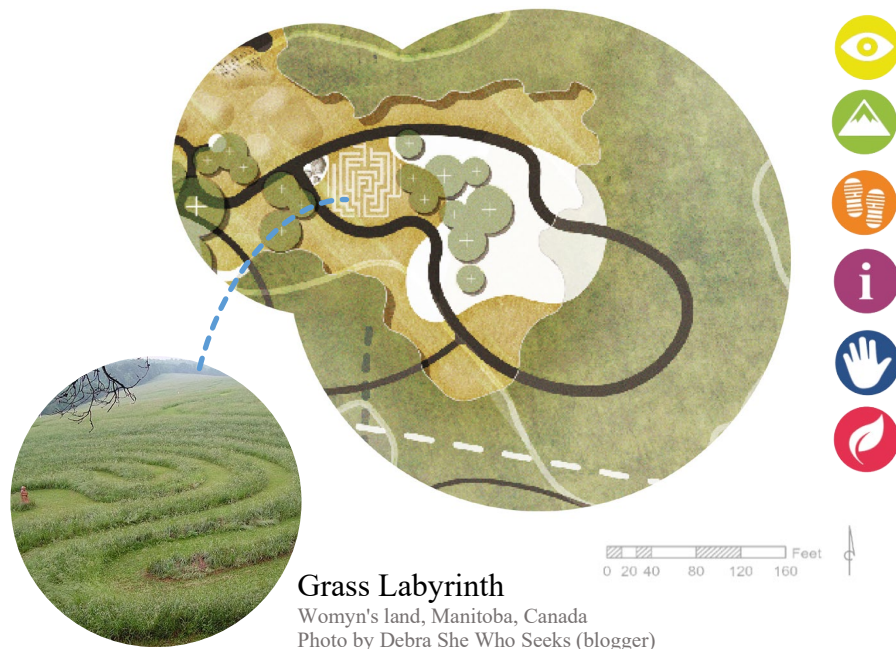
Weaving Art, Science, and Play into an All-Ages Adventure (Stage 2)

At such a time when Glenstone acquires the second trailhead property, the second stage will expand the Welcome Center into that new space, adding a looped path designed to offer a sensory-rich art and discovery experience. The Adventure Loop (Figure 3.44) is an all-sense engagement area designed for the adult

Figure 3.43 The Pine Meadow Prospect creates a refuge beneath the cool shelter of the trees from which visitors may enjoy watching the dancing leaps of field sparrows.



Figure 3.44 The Discovery Loop weaves through areas of meadow and woodland landscape, as well as more programmed, interactive areas.



neurodivergent but usable by all ages. Research participants remarked wanting to engage with sound, climbing, and enclosed or hidey-hole spaces. Sculptural art creations that double as climbing or exploring features link to the local habitat with nature-inspired forms and natural wood and stone materials. Interactive elements percolate the site in obvious and non-obvious locations, encouraging a scavenger hunt-like approach to exploring this park section. Discovery of these sensory stations rewards visitors with experiments that not only explore the senses but also the qualities of the natural environment.

Since this area of the park may be implemented at a much later date than the first stage, I did not design this area beyond the path of the loop trail, the location for a mown grass labyrinth, and a central area which houses the larger structures and installations, indicated in white in Figure 3.44. This area may also utilize strategies such as raised beds integrated into the design to create spaces for sensory-rich plantings that would otherwise wither in the serpentine soils. These plantings should include fragrant varieties, such as the crisply aromatic mountain mint (*Pycnanthemum* sp.). Shrubs may also be used to create defined spaces, especially to delineate quiet zones for retreating from the activity and noise. Figures 3.45 – 3.50 explore themes of enclosure, sound, cradles, respite, and art through precedent examples.

Figure 3.45 Human-sized nests satisfy the primal need for enclosure – as well as playfully engage with the surrounding ecosystem.



Private residence, Garzón,
Uruguay
Designed by Charlie Baker
bakerstructures.com



Hjälmarviksparken in
Sweden
Designed by URBIO
landzine-award.com



Weaver Nests by Porky
Hefer
wordpress.com

Figure 3.46 Differences in the lengths and widths of wood boards and the crystalline structure of rock minerals create opportunities to explore sounds and music. Interconnected Acoustic elements can be implanted into tree trunks, carrying secret messages across the site.



Grizedale Forest
Photo by Dave Ball
public-art.shu.ac.uk



Botanical Garden of the
Capital City of Prague
Photo by Lukáš Gavlovský
gavlovsky.cz



Čapí hnízdo farm, Czech
Republic
Photo by Lukáš Gavlovský
gavlovsky.cz

Figure 3.47 Rope and cord slings in various forms support the full body, creating moments that calming the sensations of one's joints and feet.



Erfurt Egger Park, in Germany
Designed by Rehwaldt
Landscape Architects
goood.cn



Dan Ryan Woods Nature Play
Garden
Designed by site design
group, ltd.
site-design.com



© Aoyah Group
[Pinterest.com](https://www.pinterest.com)

Figure 3.48 Sensory retreats create critical escapes when the sound, movement, and textures from other areas become too abrasive.



Designed by Willows
BVBA
© Wilgen
wilgen.be



Ika Meditation Spot,
Romania
Designed by batlab
architects + studio nomad.
Photo © Bence Pásztor
landzine.com



Monarch Center for Autism,
in Ohio
Photo by Richard
Mandelkorn
landscapearchitecturemagazine.org

Figure 3.49 For when informational signs aren't enough, other interactive elements feed curiosity and passion for the park's unique ecosystem.



Giant deer ears form a hearing amplification installation
Location and source unknown
[pinterest.com](https://www.pinterest.com)

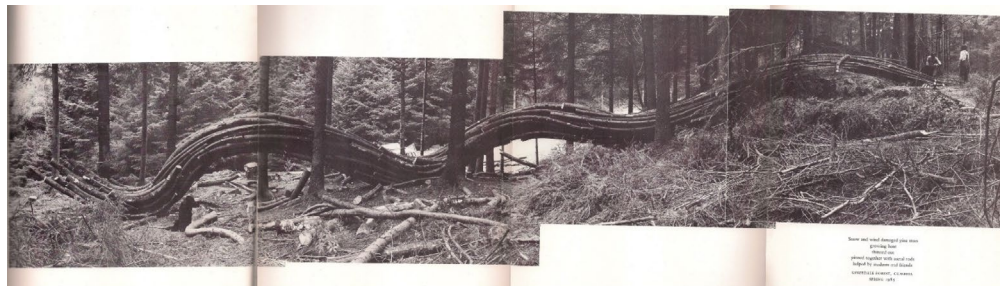


Tree species labels at the Iława Forest in Poland
Designed by Landscape Architecture Lab.
Photo by Aleksandra Matyas.
[landezine.com](https://www.landezine.com)



Large MagPost (patented)
Photo © Caledonia Play
[caledoniaplay.com](https://www.caledoniaplay.com)

Figure 3.50 Art installations that twine along the ground and overhead in ribboned, organic forms echo the stream further within the park, and play a visual pun referencing the park's defining rock



Sidewinder by Andy Goldsworthy, at Beacon Crag, UK
Photo by Andy Goldsworthy | [Wordpress.com](https://www.wordpress.com)



Meander by Kristina Veasey
Photo © Kristina Veasey
[forestofdean-sculpture.org.uk](https://www.forestofdean-sculpture.org.uk)



Storm King Wall by Andy Goldsworthy
Photo by Rosemary (blogger)
[wordpress.com](https://www.wordpress.com)



Yellow Zingers by Tim Prentice
Installed at the Atlanta Botanical Garden in 2008
Photo © Sculpturesite Gallery
[sculpturesite.com](https://www.sculpturesite.com)

Conclusion

I began the design phase of this research with five objectives aimed at achieving the overarching goal of centering neurodiversity. Those objectives, along with the eight themes from the qualitative data analysis serving as guiding principles, led me to create a design for the LSBCP that draws heavily from natural forms and materials, offering various avenues for sensory engagement and interaction with natural features. While developing this design, I combined my DCD approach with a UD approach in unexpected ways. This method presented both benefits and drawbacks. I also discovered that, although the constraints of designing for a conservation park posed certain challenges for the DCD approach, I could still incorporate a considerable amount of the participants' feedback and ideas within the park features. Lastly, I found that the inability to obtain feedback from participants at a later, more developed stage of the site design was a hindrance. In the next chapter, I further explore these aspects and examine the effectiveness of DCD as a design strategy for natural parks.

Chapter 5: Discussion

The participatory research, site research, and design stages of this MLA thesis project aimed to test how effectively and in what ways a Disability-Centered Design (DCD) approach could be applied to the landscape architecture of public spaces, such as natural public parks. This process also involved exploring the possibilities of creating a neurodivergence-focused design that actively centers on the experiences, needs, and preferences of neurodivergent individuals within public natural environments. In this chapter, I will reflect on both the strengths and limitations encountered in working toward this design goal, as well as assess how elements of the research methodology may have shaped the outcomes and the project's ability to meaningfully test Disability-Centered Design. Following this, I will consider the broader applicability of the DCD framework to the design of natural public parks, offering a critical perspective on its potential and limitations. The chapter concludes with further reflections, including thoughts on the impact of Universal Design for Learning (UDL) and opportunities for future research that could investigate how UDL principles might be integrated with or complement DCD in landscape architecture.

Effectiveness of the Design in Centering Neurodivergence

Although I gained valuable insight during the research stage, the design process was more challenging due to the lack of existing examples of landscapes specifically designed for neurodivergent adults. As I discussed in the first chapter, most precedent projects and resources focus on children, often within playground or therapeutic settings, and rarely address the full range of adult sensory needs, interests,

and ways of engaging with the natural world. This scarcity resulted in few models to draw inspiration from, making it harder to envision and justify certain design decisions. Against this backdrop, the proposed design for the LSBCP represents a valuable and ambitious effort to create a natural space shaped by neurodivergent voices and perspectives, particularly through participatory research and collaborative design. This direct engagement ensured that the final design reflects a meaningful integration of neurodivergent experiences, interests, and needs and is deeply informed by the lived experiences and insights of neurodivergent participants.

One of the most significant strengths of the design is how thoroughly it integrates elements of the participants' feedback. Numerous features draw directly from participant suggestions or serve similar functions to those imagined by participants. The niches, signage, Art Walk, and Discovery Loop especially incorporate opportunities for interaction and tactile engagement identified by the participants. Overall, the material choices and the use of forms and icons reminiscent of the park's flora and fauna address the participants' desire for both “whimsy” and function, as well as seamless integration of built features with their natural surroundings. The design also responds to desires for quiet, immersive experiences by incorporating small spaces off the main trail where visitors can retreat and connect with nature. These features are complemented by multipurpose spaces that allow for both quiet individual activities, such as birdwatching and sketching, and, separately, more communal or performative uses, such as the pavilion, which can flexibly host public events, and the outdoor amphitheater.

Additionally, the design addresses sensory sensitivities by incorporating areas that are distanced and/or sheltered from man-made sights and sounds, fostering a more peaceful and restorative environment. The importance of physical activity and movement is also acknowledged, as reflected in the inclusion of large climbing boulders and the recommendation for treehouse-like structures within the Stage 2 area. Areas with higher activity and sensory engagement are complemented by nearby spaces for restorative retreat, enabling visitors to step away without traveling far. Positioned farther from the activity zones, the six niches deeply immerse visitors in the natural environment. Each niche is associated with a distinct habitat, giving it a unique character. This not only creates memorable experiences within each niche but also allows them to serve as landmarks that help visitors navigate within the park.

The design also incorporates more nuanced participant insights. One element discussed during a sensory audit walk was the benefit of facilitating the transition between the park and the surrounding environment through visual and/or audio cues. I integrated this insight into the park's edge design using the heartwood gateway, which features a mixture of natural and painted wood to mark the boundary between the park and the parking lot. Additionally, inspired by one of the event ideas generated by a group of four participants during the group brainstorming activity of the design workshop, I incorporated a “scavenger hunt” atmosphere into the Discovery Loop area, adding layers of exploration and engagement throughout the space.

Finally, I redesigned the interpretive and directional signage based on feedback from participants during the audit walks. They emphasized the need for

more accessible and engaging signs, which led to the incorporation of image-based and three-dimensional elements that offer visual and tactile information. Trail intersection signs now encompass all the essential information identified by participants, including trail length, anticipated slope, a trail map, and braille lettering, ensuring clarity and ease of navigation for all visitors.

While the proposed park design exhibits many thoughtful elements that prioritize neurodivergent experiences, there are still some aspects where I found it challenging to fully support neurodivergent needs. These shortcomings often stemmed from site-specific constraints, broader systemic issues within existing design references, and the difficulty of creating scalable, widely applicable interventions.

One of the most significant challenges was the issue of disruptive sounds. The park's location and surrounding context result in considerable "sound injection" from anthropogenic sources, such as the nearby Glen Road or "mow and blow" landscaping maintenance from the surrounding residential properties. The soil conditions at the site further constrained potential mitigation strategies. In areas with different soil types, the land can often be contoured or raised to help buffer noise, and in locations with more robust plant diversity, evergreen species can provide natural sound screening. Unfortunately, due to the specific ecological and geological conditions of this site, both of these solutions would pose significant harm to the delicate serpentine barrens ecosystem. As a result, visitors who are particularly sensitive to anthropogenic noise and sights may continue to find the park overstimulating. Although the site features a unique and ecologically fascinating landscape, which could offer other forms of engagement, I was unable to collect data

to determine whether this positive attribute is strong enough to offset the negative sensory impact for neurodivergent individuals. There is a possibility that despite the creative design, the park may not be an ideal site for a neurodivergent-focused intervention in its current form. Further research and participant engagement would be needed to better understand this dynamic.

Another limitation in the design process emerged during the exploration of precedents for sensory-rich interactions in natural spaces. As I mentioned earlier, most of the available references for sensory trails and interactive elements assume children as the primary users, often with parents guiding the experience. The overwhelming presence of children in the visual and conceptual materials made it challenging to find scalable ideas that felt appropriate, comfortable, or empowering for adult neurodivergent users. With a focused goal of centering adults first, the lack of adult-oriented references posed a challenge in defining elements for the Discovery Loop. The final design for this area remained somewhat underdeveloped, largely due to time constraints but also because of the absence of existing models that could serve as inspiration for inclusive and adult-oriented sensory design features.

Furthermore, the design significantly depended on the unique partnership between Glenstone and M-NCPPC to integrate an art-based design philosophy not only throughout the trailhead area but also across the conservation park. While this collaboration possesses the potential to foster a distinctive and enriched aesthetic and interpretive approach, it may also restrict how transferable these strategies are to other natural public parks that lack similar partnerships. In more resource-constrained settings, the same level of design refinement may not be achievable. Nevertheless,

many aspects of this design can be adapted or simplified for broader use. For instance, instead of custom-designed seating, straightforward wooden or natural half-trunk benches can serve a similar function and sensory value. Strategically placing stopping points near notable landscapes, even just slightly off the main trails, can replicate the effect of my more elaborate niches.

Meanwhile, enhancing signage, such as increasing the amount of image-based information and reducing reliance on text, provides a relatively simple and scalable way to assist neurodivergent users. Where tactile signage is not feasible, visual storytelling through high-image content serves as a more accessible alternative. Additional information can be easily added to signs at trail intersections without significantly increasing their costs. Navigation can also be improved by boosting the visibility of the trails. Utilizing natural materials like fallen limbs to informally define trails, especially in areas where leaf litter obscures the path, presents a low-cost and environmentally friendly approach. This strategy not only enhances wayfinding but also helps manage human impact by containing foot traffic and minimizing trail erosion.

Furthermore, utilizing existing natural features is a valuable strategy. For instance, participants were attracted to the large rock formations at Rachel Carson Park, which, although not officially included in the trail system, had clearly been visited frequently, as evidenced by a well-worn desire path. When identified, attractive features like these that provide an opportunity for direct engagement are worth incorporating into the official trail system.

In summary, while the design process aimed to center neurodivergent experiences, several areas illustrate the real-world complexities of doing so effectively. Environmental constraints, gaps in inclusive design precedents aimed at adult visitors, and dependence on unique partnerships all posed challenges. However, these insights offer valuable lessons for future projects: to more explicitly balance ecological interest with sensory comfort, advocate for more neurodivergent adult-oriented design references, and seek scalable, flexible interventions that can be adapted across diverse park settings.

Overall, the strengths and limitations of the proposed park design highlight the promise and complexity of centering neurodivergent experiences in landscape architecture. The participatory process was clearly beneficial, resulting in a design that thoughtfully integrated many key sensory preferences and creative contributions from neurodivergent participants. Features such as secluded nature-immersion spaces, tactile engagement with the environment, and flexible public use areas reflect a strong commitment to inclusive and responsive design. However, the project also encountered challenges that emphasize broader issues in accessible design practices. Site-specific constraints, particularly regarding sound and visual disturbances, presented genuine barriers to comfort, while a lack of existing adult-oriented sensory design precedents limited some elements of development. Furthermore, reliance on a unique institutional partnership raises concerns about the replicability of some of the more resource-intensive features in other contexts. Overall, this project illustrates how centering neurodivergent needs can foster innovative, human-centered

landscapes, while also highlighting the necessity for more systemic support, adaptable strategies, and inclusive design resources to more widely realize such visions.

Effectiveness of the Methodology

The research methodology for this project combined established frameworks with newly adapted approaches to better focus on neurodivergent experiences in the design process. While the sensory audit was partly inspired by Alexa Vaughn's accessibility audits and examples of existing sensory audit practices used in classroom settings, the final methodology represented a new and context-specific approach tailored to outdoor, natural environments. Rather than solely assessing accessibility compliance or predefined sensory categories, the audit emphasized participant-led observation and real-time interpretation of sensory experiences. Similarly, the design workshop relied more heavily on visual arts-based participatory methods, creating space for creative expression and collaborative ideation, instead of traditional design feedback methodologies. These adaptations enabled the research to reveal rich, nuanced insights from participants while also identifying areas for improvement in both method and structure.

Several aspects of the methodology proved particularly effective in guiding the development of a neurodivergent-centered landscape. One of the most fortunate choices in the research process was conducting sensory audit walks in an existing, fully designed natural park. Although this decision arose from the unsafe walking conditions at the LSBCP, by engaging participants directly within the environment of the Rachel Carson Conservation Park, I was able to collect grounded, detailed feedback in response to real-world conditions, allowing participants to reflect on their

immediate sensory experiences. This approach led to insights that likely would not have emerged if the sensory audits had taken place in the undeveloped LSBCP. For instance, the strong desire expressed by participants for stopping points separated from the main trail became a key design feature, one that might have been overlooked without this direct, site-based engagement. Similarly, specific feedback about the shortcomings of the park's existing informational and directional signage provided concrete, actionable guidance for improving communication and wayfinding in the new design.

The feedback gathered during the audit walks also included several unexpected yet impactful observations. Some of these insights shifted the trajectory of the design. For example, the repeated emphasis on the importance of spatial separation from the main trail was not anticipated at the outset but became central to the layout and programming of the park. In this way, the methodology allowed space for participant insights to inform my design priorities, rather than merely validating preexisting assumptions.

While the overall research methodology produced valuable insights and led to a design strongly informed by neurodivergent experiences, there were areas where the process could have been improved to enhance the outcome. One of the most significant weaknesses was the lack of an opportunity for participants to provide feedback on the actual design proposal. Ideally, there would have been multiple rounds of feedback to allow participants to respond to early drafts and help refine the design direction. However, due to time constraints and logistical challenges related to the timing of the winter holidays, I was unable to incorporate additional participant

engagement once I entered the design phase of the project. Looking back, the timeline could have been adjusted to provide a longer gap between the audit walks and the design workshop. At the time, I was concerned that participants might forget key details from the walks if too much time passed, but in hindsight, that may not have been a significant issue. Even a brief follow-up session focused on reacting to a more developed concept design, paired with shorter versions of the three breakout sessions, may have enhanced the depth and clarity of the design direction.

Another challenge arose from the decision to conduct sensory audits at a site different from the one being ultimately designed. While this method offered valuable real-world interaction with a completed natural park, it limited the capacity to collect site-specific sensory feedback regarding the LSBCP. This was a significant drawback, given that the design goal was closely tied to sensory experience. Instead of visiting the LSBCP, participants viewed video and audio recordings of the site during the first part of the design workshop. Although this was a creative workaround, it did not fully replicate the embodied experience of being in the landscape. Ultimately, the main safety issue—slippery footing due to invasive stiltgrass—would have been resolved by late winter, but this was discovered too late to adjust the research timeline, leaving insufficient time afterward for the design workshop and the remaining stages of this MLA thesis project. Consequently, I was compelled to make several estimations about how participants would have reacted to elements of the LSBCP site based on their comments at the Rachel Carson Conservation Park. This introduced a degree of guesswork into decisions that ideally would have been informed by participants.

There were also several areas of sensory experience that my research did not explore in enough depth. Natural and artificial lighting were not considered as thoroughly as they could have been, despite their importance in shaping how neurodivergent individuals experience space. Similarly, the design process did not fully account for the park's usability and atmosphere throughout all seasons and weather conditions, such as rain, snow, or the contrasting qualities of spring and fall. This limited the final design's capacity to respond to year-round sensory variability.

The structure and timing of the sensory audits and the design workshop also posed limitations. During the sensory audit, there was insufficient time to fully engage with all the feedback methods I had planned. Participants were somewhat rushed through the experience, and many could not linger or reflect as deeply as they might have with more time. Although I intended the inclusion of a photography component to provide an alternative form of expression, the resulting narratives were limited, possibly due to the format of typing them on the phone. Consequently, the photo element became one of the least valuable data sources. In retrospect, this could have been more effective as a standalone photovoice activity conducted during a longer gap between the two in-person events.

The design workshop also faced similar time constraints. By prioritizing the breakout activities to gather participants' ideas, there was less time for a more formal critique of the early concept diagrams. Although I collected some useful feedback during the full-group discussion, the process missed an important opportunity to ask participants about what they did not want or would prefer to avoid; I captured only one comment of this nature. This gap highlights the need for more intentional

questioning during design discussions, specifically regarding dislikes, discomforts, and concerns, which are just as important as preferences and ideas in shaping inclusive design.

Ultimately, while the participatory research approach provided rich and insightful findings, it was also limited by time, logistics, and missed opportunities for deeper engagement. Future iterations of this type of research would benefit from a longer timeline, greater emphasis on iterative feedback, and a broader range of sensory and emotional responses, including negative ones.

Effectiveness of Disability-Centered-Design for Natural Public Parks

Using DCD as a guiding framework for the design of this natural public park proved to be a highly valuable approach, particularly in shaping the design language and establishing clear priorities based on the lived experiences of neurodivergent individuals. DCD offered not only a philosophical foundation but also a practical method for decision-making throughout the process. One of the project's strengths was the opportunity to explore two distinct applications of DCD: a high-intervention area at the trailhead that layered UD strategies onto a DCD foundation, and a low-intervention area within the conservation park that adopted a more purely DCD approach. In the high-intervention zone, there was an intuitive sense of greater public expectation for broad accessibility, which led to the decision to integrate more elements of UD while still prioritizing the needs of neurodivergent individuals first. In contrast, the disturbance constraints in the low-intervention conservation area drove a more purely DCD approach, with minimal additions beyond those specifically designed for neurodivergent users.

Overall, this project demonstrates that DCD serves as a strong and effective strategy for designing natural public parks. Unlike UD, DCD starts with the lived experiences, preferences, and needs of a specific disabled group. In this project, modeling DCD around neurodivergent users produced a more focused and cohesive design that aligned better with the nuanced ways neurodivergent individuals engage with natural environments.

One of DCD's key strengths is its emphasis not only on physical access but also on the quality and character of the experience for the target group. In this case, the design prioritized interventions that were meaningful, enjoyable, and usable specifically for neurodivergent visitors. Instead of focusing on whether features were broadly appealing or accessible to everyone, the design centered on the unique ways neurodivergent individuals might find comfort, stimulation, calm, or engagement in the park environment. This approach created a more integrated and internally consistent design, as all interventions supported a unified vision rather than being merely pieced together to meet generalized access goals.

DCD also proved valuable in addressing parts of the park that could not meet full universal accessibility standards due to natural and ecological constraints, such as trail areas within the conservation park where surface treatments could not be altered without compromising environmental integrity. Instead of viewing these areas as inherently inaccessible or lost causes, the DCD approach encouraged me to see them as opportunities to prioritize the needs of my intended audience. This opened the door to designing features specifically suited to neurodivergent experiences, such as multi-sensory engagement, highly detailed and frequent signage, and anthroponic

screening, while enhancing other access features where conditions allowed. The result was a layered, intentional approach that responded to both ecological limits and user experiences.

Importantly, DCD also scales well in terms of cost and implementation. While this project included higher-budget elements, the same design philosophy can be effectively applied through lower-budget interventions. Many of the changes that make a space more accessible or enjoyable for neurodivergent users—such as creating quiet spaces, adding sensory-rich yet low-maintenance features, or improving visual navigation—can be relatively low-cost and still make a significant impact. One of the strengths of DCD is that, because all interventions are aligned toward a single population, even small additions or modifications contribute meaningfully to the overall accessibility of the space for that group. This avoids the fragmentation that can sometimes result from trying to meet multiple sets of access needs in a scattered or inconsistent manner.

While Disability-Centered Design (DCD) offers numerous strengths as a strategy for designing natural public parks, it also presents certain limitations, particularly when balancing the needs of diverse disabled users and ensuring equitable access across all aspects of the park. One challenge with DCD is that, by centering the design so specifically on the experiences and needs of a single group, it can unintentionally deprioritize the experiences of individuals with other types of disabilities. For instance, although the design process included efforts to integrate physical accessibility features, there were instances where this was not considered with equal depth. A clear example of this is the amphitheater: while the middle and

top layers include intentional elements for broader accessibility, the lower level and the performance area itself are not accessible to wheelchair or scooter users. I noticed this oversight too late in the process to correct, revealing how a lack of equally weighted consideration for other access needs can lead to instances of exclusion.

Another key limitation of DCD is shared by many disability-focused design approaches: its vulnerability within the budget and planning process. Because DCD focuses on the specific experiences of a smaller subset of the disabled population, it may be perceived as more “optional” or niche by funders and decision-makers, despite providing deep and meaningful access for those it serves. This challenge is not unique to DCD; disability-focused interventions are often among the first elements to be scaled back or cut entirely when budget constraints arise. However, DCD’s specificity can make it an even easier target for these cuts, as its benefits may not always be immediately visible or widely understood outside the target group.

Layering DCD with UD, as modeled in the trailhead area, would help offset this challenge. This layered strategy also benefits from applying a more intersectional approach to DCD. While the design of the trailhead area focuses on neurodivergence, it reflects a broader diversity of neurodivergent individuals than the conservation area. Many neurodivergent people also live with other disabilities, and an intersectional approach creates opportunities to affirm and include those overlapping identities. By highlighting neurodivergent experiences holistically, the design recognizes the full complexity of disabled identity rather than assuming a singular experience.

Additional Thoughts

So far, I have not spoken in depth about one inclusive design strategy that may be key to the success of DCD: Universal Design for Learning (UDL). UDL is an educational framework first developed by Dr. David Rose and his colleagues at the nonprofit educational research organization CAST in the early 1990s, adapted from Mace's UD. It aims to create flexible learning environments that accommodate the diverse needs of all learners by providing multiple means of engagement, representation, and expression (Bacon, 2014). Although UDL officially focuses on curriculum development, some authors have blurred the distinction between UDL and UD. In his book *Academic Ableism: Disability and Higher Education*, Jay Timothy Dolmage (2017) fluidly uses the language of UD for built environments to describe the pedagogical impact of UDL in higher education, saying:

I want to center the idea that we must design a future for higher education that acknowledges but rejects its eugenic, steep steps history, refuses to accept an ongoing series of retrofits and slapped-on accommodations, and values instead the unpredictable times and places of disability to come. (p. 124)

Like the 7 Principles of Universal Design, UDL can be defined by a set of official guiding principles recently published and updated by CAST (2024). Dolmage summarizes these into three principles: 1. "Multiple means of representation" of information, 2. "Multiple means of expression, to provide learners alternatives for demonstrating what they know," and 3. "Multiple means of engagement" (p. 145). It's easy to envision how these principles can be applied to the physical environment: 1.

Multiple means of representing information about the site (interpretation, navigation, intended use, etc.), 2. Multiple ways for users to use or respond to that information, and 3. Multiple ways to engage with the site and the information about it.

In searching for precedent literature discussing ways to use UDL principles in the built environment, I found only one study that examines strategies for applying UDL principles to museum exhibit design. I was unable to find literature that applies the choice-focused approach of UDL to either architecture or landscape architecture. I find the emphasis on choice as a central element of inclusive design intriguing; it offers a potentially distinct approach from DCD to addressing the challenges UD faces in accommodating conflicting needs—specifically, providing a diversity of options rather than starting from a more specific focus. For designs centered around neurodivergent experiences, especially, providing choice may help a design better align with a community that often internally includes directly conflicting needs and interests. However, I do suspect there are drawbacks to this approach that do not exist in UDL’s original classroom context. For instance, while a professor might repeatedly adjust the ways and options for engagement based on ongoing student feedback or changes in classroom dynamics, a landscape architect must predict what options are needed ahead of time. Even when aided by a participatory design process, these decisions will be challenging to adjust later once the design has been completed. Rather than attempt a shallow analysis of UDL’s application to landscape architecture, I believe this subject deserves a more focused research study—one that similarly explores where, how, and in what combination with other approaches UDL may be best utilized as a tool for landscape design.

Conclusion

This project highlights both the promise and the challenges of designing public natural landscapes that center on the experiences of specific disabilities through a DCD approach. By focusing deeply on the unique needs and interests of neurodivergent individuals, this design creates meaningful, nuanced spaces that prioritize sensory and knowledge engagement, comfort and exploration, and affirming environments.

Nonetheless, the limitations of DCD, including its restricted intersectionality and the risk of being perceived as trivial or narrowly focused, present significant challenges for DCD's application to the design of public landscapes. In this case, UD's ability to address these weaknesses when used as a complementary strategy with DCD emphasizes the importance of balancing specialized design with broader accessibility frameworks.

Further exploration may reveal insights into how strategies like Universal Design for Learning (UDL) can similarly strengthen the DCD approach. However, these strategies require careful adaptation to the realities of outdoor built environments, especially considering that existing associations—such as UDL's specific connection to classroom settings—may cause some confusion.

Ultimately, creating truly inclusive landscapes is an imperfect, iterative process that combines focused attention on specific user groups with flexible, intersectional thinking and a willingness to refine methods as new knowledge emerges. This project establishes important groundwork for such efforts and

highlights promising directions for future research and practice in inclusive landscape architecture.

Chapter 6: Conclusion

In the introduction to this MLA thesis, I drew on the words of David Gissen to ask whether a disability critique of greenspace should focus solely on gaining access to these landscapes as they currently exist or whether it should also rethink the values that shape them. I hope that by this current chapter, my readers have already begun to critically examine the values that shaped their designs. My work has argued that accessibility is not just a matter of physical entry or navigation, but of full sensory, cultural, and emotional participation. This requires reevaluating the assumptions that underpin public space design, using a Critical Disability Theory lens. I posit that disability-centered design (DCD) is a promising approach to designing inclusive built environments by explicitly empowering disabled designers and uplifting the lived experiences of their own disabled communities.

This is a significant shift from universal design, which, while foundational in improving access, often treats disability as a general category and tends to prioritize solutions that benefit the widest audience rather than addressing specific needs. Moreover, universal design does not inherently place disabled people in positions of authorship or decision-making. DCD, by contrast, begins with the premise that disabled people are not simply users of designed space, but should also be its creators.

This research advances the field of landscape architecture by operationalizing DCD in a real-world context: a natural public park. Through a design process rooted in participatory research with neurodivergent participants, I was able to test how a specific-disability focus could inform every stage of analysis, ideation, and proposal. The resulting design for the Lower Serpentine Barrens Conservation Park

demonstrates that DCD can produce spaces that feel validating, empowering, and deeply responsive to a community's specific experiences. The inclusion of neurodivergent voices revealed how complex and layered our experiences of space can be.

While the research addressed not only the intensity of sensory input and sensitivity to it, but also the type of sensory source, it did not fully capture the richness of these engagements. A sensory mapping exercise, conducted on-site and in real time using frameworks such as Jensen and Finnigan's sensory webs, would have added a valuable dimension to the study. Though this component fell outside the scope of the current project, it represents a compelling direction for future research and participatory methodology, particularly in the context of neurodivergent design.

At the same time, this research exposed real challenges facing DCD as a design strategy. Because DCD is rooted in specificity, it can risk being perceived as narrow, exclusive, or even trivial when applied to complex, multi-use public spaces. It also requires that disabled people be in the position of designer—a demand that is complicated by the structural underrepresentation of disabled individuals in design professions. As Deaf landscape architect Alexa Vaughn has noted, being the only disabled person in one's classroom or office is not an exception, but a norm (Gamolina, 2023). Her experience speaks to the broader need for more inclusive educational and professional pathways into the field. The future of DCD relies not only on engaging disabled users in the design process—which is itself essential—but on ensuring that disabled people are fully equipped and empowered to lead it. This means not just creating seats at the table, but redesigning the table itself.

As I reflect on the broader implications of this work, I'm struck by the many directions that fell just outside the scope of this project: how DCD might intersect with race, class, and cultural identity in public space; how other disabled communities might develop their own design guidelines; how this approach might transform not just park spaces but intimate spaces, workplaces, and cities. Still, this project represents a meaningful beginning. It affirms that DCD is not only a viable design approach, but a powerful one—one that can ground design in lived experience, honor specific ways of moving through and sensing space, and push back against norms that have long excluded disabled people from the landscapes they inhabit.

This project began as a personal question. As an AuDHD landscape architecture student preparing to enter the field, I wanted to know whether there was a way to design landscapes that didn't simply make room for people like me, but that were built with our experiences at the core. In pursuing that question, I found a design approach that not only validated my identity but strengthened my belief that disabled designers can transform the field—not by widening existing pathways, but by carving new ones entirely.

Appendix A:IRB Exemption



UNIVERSITY OF
MARYLAND

INSTITUTIONAL REVIEW BOARD

1204 Marie Mount Hall
College Park, MD 20742-5125
TEL 301.405.4212
FAX 301.314.1475
irb@umd.edu
www.umresearch.umd.edu/IRB

DATE: September 16, 2024

TO: Elliott Kenney
FROM: University of Maryland College Park (UMCP) IRB

PROJECT TITLE: [2222292-1] The Art of Access: Celebrating Disability through Collaborative Design

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: September 16, 2024

REVIEW CATEGORY: Exemption category #45CFR46.104(d)(2)(ii).

Thank you for your submission of New Project materials for this project. The University of Maryland College Park (UMCP) IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact the IRB Office at 301-405-4212 or irb@umd.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

Appendix B: Sensory Audit Walk Assigned Questions for Route Stops

Note: Questions with ☺ are yes/no paper card questions.

Stop 1: Interpretive Sign – Finish by 1:20

- ☺ How likely are you to read the information on this sign?
- ☺ How likely are you to go out of your way to read this sign?
- ☺ How well does this sign communicate the information to you?

Stop 2: Clear Forest – Finish by 1:30

- ☺ How do you feel about the openness of this environment?
- ☺ How safe do you feel at this spot?

What draws your attention here?

What aspect of this spot is most enjoyable?

Is there anything here that feels uncomfortable?

Which senses are you most aware of at this spot?

Would anything make this space more interesting, enjoyable or comfortable?

Stop 3: Boulder Pile – Finish by 1:36

If you feel comfortable, you can have **a minute** to climb the rocks (be careful)

- ☺ How safe do you feel on or around these boulders?
- ☺ How likely are you to go out of your way to visit this boulder pile?

Stop 4: Green Briar – Finish by 1:40

- ☺ How do you feel about the textures at this spot?
- ☺ How do you feel about the scents and smells at this spot?
- ☺ How do you feel about the sounds at this spot?
- ☺ How safe do you feel at this spot?

Stop 5: Wayfinding Sign – Finish by 1:46

- ☺ How confident are you that you know where we are now in relation to where we started?
- ☺ How confident are you that you could navigate the trail systems at this park without getting lost?
- ☺ How well does this tower sign help you decide where to go from here?

Stop 6: Riverside – Finish by 1:56

- ☺ How do you feel about the sounds at this spot?
- ☺ How safe do you feel at this spot?

What draws your attention here?

What aspect of this spot is most enjoyable?

Is there anything here that feels uncomfortable?

Which senses are you most aware of at this spot?

Would anything make this space more interesting, enjoyable or comfortable?

Stop 7: Bridge – Finish by 2:08

- ☺ How safe do you feel crossing this bridge?
- ☺ Does this bridge need anything added to it to make you feel comfortable crossing it?

Stop 8: Edge of the Woods – Finish by 2:28

- ☺ How well does this work as a transition from one type of space to another?
- ☺ Does this space need anything to make this transition more comfortable?
- ☺ Does this space need anything to highlight the change more?

Stop 9: Meadow – Finish by 2:48

- ☺ How do you feel about the sounds at this spot?
- ☺ How do you feel about the textures at this spot?

What draws your attention here?

What aspect of this spot is most enjoyable?

Is there anything here that feels uncomfortable?

Which senses are you most aware of at this spot?

Would anything make this space more interesting, enjoyable or comfortable?

RETURN BY 3:00

Appendix C: Sensory Audit Walk Instruction Sheet

INSTRUCTIONS

AT STOPS



Cue Card Questions: Answer Questions with Smile/Frown Cue Cards

When prompted, hold up a smile or frown card to answer a question. Whenever a cue card question is asked, Elliott will clarify how to use the cards to answer.



Generally, the smile card means things like “more good, more strong, etc.” and the frown card means thing like “less good, less strong, etc.”



You can also answer by not holding up a card. Not holding up a card always indicates a neutral answer.



Open Ended Questions: Verbal/Written Response

Answer open-ended questions with a verbal response.



You can also write your response on the scrap paper on your clipboard and show it to today's volunteer to notate and read aloud.

Elliott will always clarify when a question is open-ended.

BETWEEN STOPS



Speak (Write) Up: Verbal/Written Observation

In between stops, if something stands out to you (sensation/sound/etc.) or you want to share an observation related to navigation or signage, you can comment out loud to the group.



You can also write your observation on the scrap paper on your clipboard and show it to today's volunteer to notate and read aloud.

ANYTIME



Notate Map: Mark Observations/Reactions on Map

You can use any (or all) of the colored pens and stickers provided to log observations, thoughts, or reactions on your map.

You can decide what the colors and stickers mean but make sure to **log your meanings in the key box** at the top right corner of the map.



Upload Photos: Capture Something Notable

If something about the landscape stands out to you, you can take a photo of it and upload it using this QR code.

Make sure to **write a bit about why you took the photo and mark on your map where the photo was taken.**

Appendix D: Sensory Audit Walk Instruction Script

Introduction – 1:00 – 1:10

PROJECT INTRO

- Two-part design research on Disability-Centered Design
- DCD a step further than other strategies of designing for disability
- Not just access – full experience
- Driven by the disability community – typically a specific subset
- I’m AuDHD, Dyslexic, and a bit of a nature nerd
- Explore how to center neurodiversity in the design of a nature park

PART 1 + PART 2

- In part 2 we will be brainstorming design ideas for a conservation park that doesn’t have any trails or facilities on it.
- Design likely won’t be literally built, but hoping our work will be resource for that and other parks
- That park is Lower Serpentine Barrens Conservation Park
- Landscape of that park has similarities with areas of this park
- Today we will walk though this park, pausing at those similar ecosystems and key design points to explore how we fit in this space
- Will bring what we explore today with us to inform our designing in part 2

INSTRUCTIONS

- Take a look at the top page on your clipboard
- A few different strategies to analyze this space
- We will stop at points along route. I ask two types of questions:
 1. Most common, you use **smilie face** cards to respond. Smile is more positive response. Frown is more negative response. You can also not use a card to indicate neutral response. **No right answer, because sensitivities (and hypo-sensitivities) aren’t going to be the same.**
 2. Other, **verbally respond** – more open ended.

- Can **speak up** between stops at any time.
- If **nonverbal** today, can use scrap paper to write open ended replies/comments. Volunteer can take them to add to their notes and/or read out loud.
- Also can make notes or comments on your map. Supplied some stickers, different colored pens. Just make sure to **fill out your key** for what your stickers/colors mean.
- Lastly, can take & submit photos. Use QR code to upload up to 4 at a time. (Just use QR again to upload more). **Make sure to write in the text box a little bit about why you took photo.**

QUICK HISTORY/BACKGROUND OF SERP BARRENS

I'm passing around some photos of the Lower Serpentine Barrens Conservation Park.

*Before European colonization, the serpentine barrens ecosystems were meadowland that were fire managed by the **Piscataway** and **Susquehannock** people.*

Fire suppression policies, especially after 1930s, caused oak/hickory forest to replace much of the meadows.

It is a globally rare ecosystem and host to at least one endangered plant species.

The unique geology - alkaline rock and shallow soils create pressures that have really interesting effect on the ecosystem. We will talk a bit more about that at our second stop.

Now we will get started on the walk. If you have any questions, feel free to ask as we make our way to stop #1.

Appendix E: Sensory Audit Walk LSBCP Context
Printout Sheets

Lower Serpentine Barrens Conservation Park

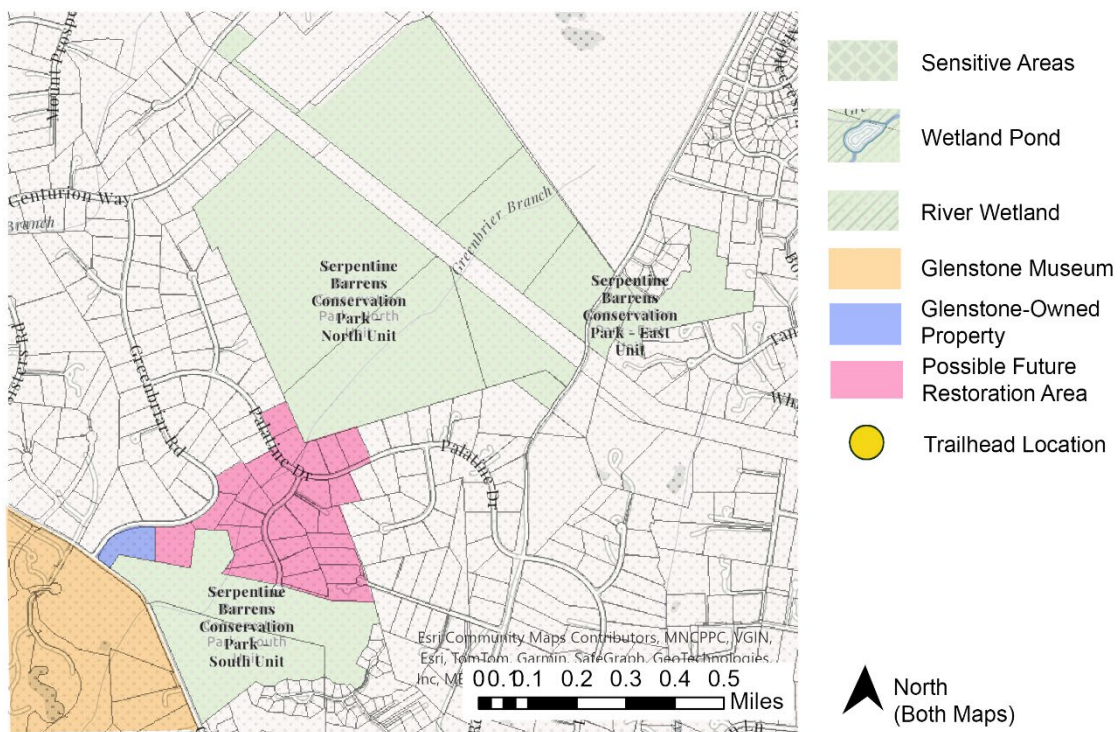
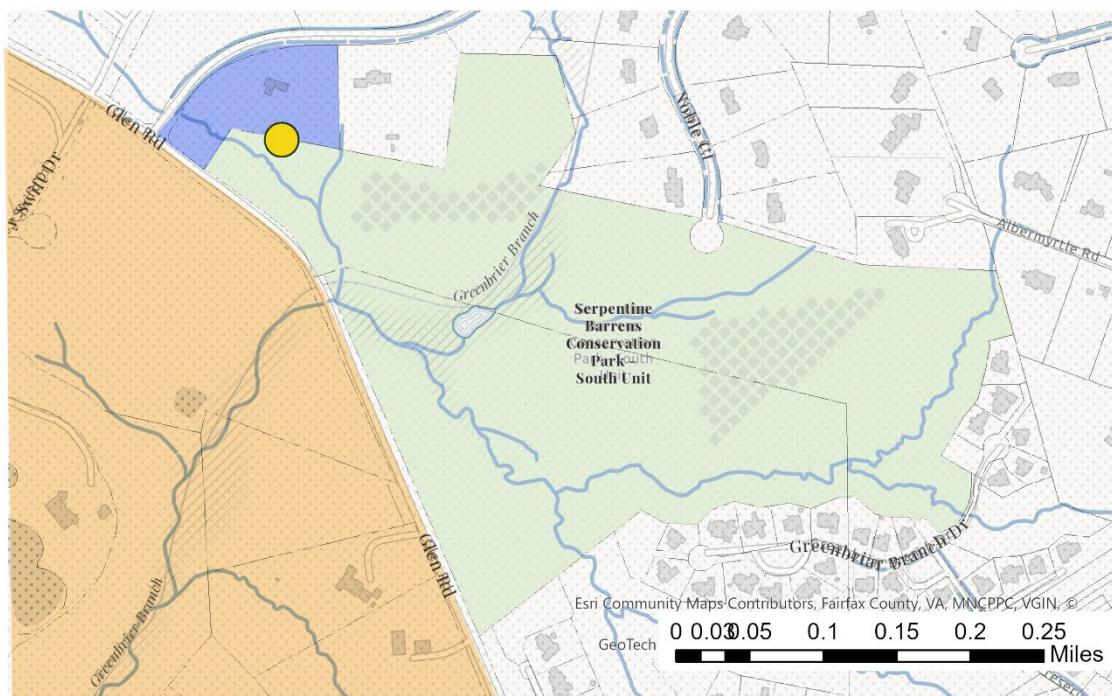
Host to Rare, Threatened, and Endangered Plant Species











Appendix F: Sensory Audit Walk Script for Introduction at Each Stop

Stop 1: Interpretive Sign

Intro: This is a very typical interpretive sign used at natural parks. Some parks, like the Serpentine Barrens, have access to additional resources which allow additional ways to educate about the landscape. I'm passing around some photos of examples.

Stop 2: Clear Forest

Intro: The shallow soils of the Serpentine Barrens create unique pressures on the ecosystem. Trees that size (point) which here would be maybe 50 years old could be over 100, 150 years old. Similar to this spot, there are very little underbrush or shrubs. It's a very open forest.

Stop 3: Boulder Pile

Intro: The Serpentine Barrens doesn't naturally have a boulder pile like this, but the nearby quarry gives the opportunity to create a space for climbing that could look like a natural outcrop.

Stop 4: Green Briar

Intro: The Serpentine Barrens has patches of a native thorny greenbrier plant that looks very similar to these non-native briars. Take a moment to listen to your senses.

Stop 5: Wayfinding Sign

Intro: Natural parks have different ways of helping visitors navigate. Some rely solely on painted trail markings on trees. Others use tower signs like these at intersections. There's always room to think about new and better ways to help visitors navigate.

Stop 6: Riverside

Intro: The Serpentine Barrens has a creek that cuts through the center of the park. It's smaller than this, although it can swell to about this size after a lot of rain.

Stop 7: Bridge

Intro: There will likely be a need for at least one trail at the Serpentine Barrens Park to cross the creek I mentioned at our last spot.

Stop 8: Edge of the Woods

Intro: The Serpentine Barrens has meadow at the trailhead and in pockets inside the forest.

Stop 9: Meadow

Intro: Due to the shallow soil, the meadows at the Serpentine Barrens Park reach only about to your knees, which a few taller milkweeds. This spot isn't too far off, and like some of the meadow land at Serpentine Barrens, it's close to the road.

Appendix G: Sensory Audit Walk Interpretative Signage Precedent Examples



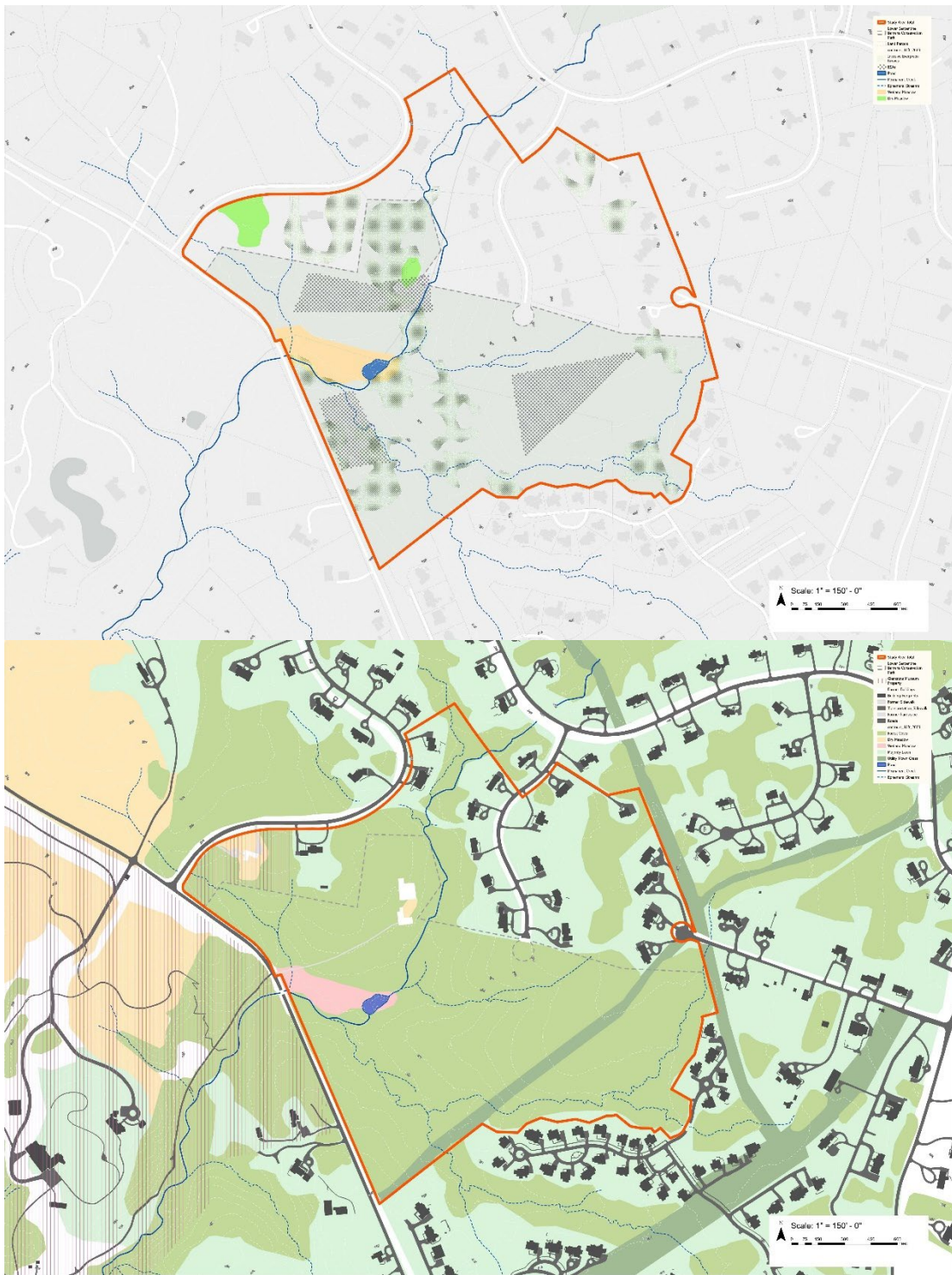


Check out our wonderful new wayside exhibit!

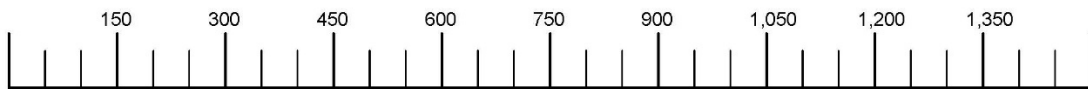
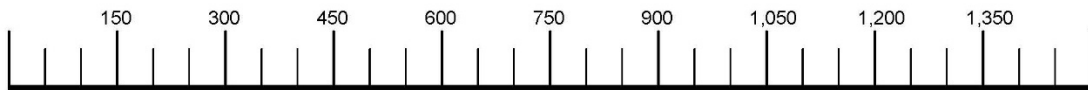
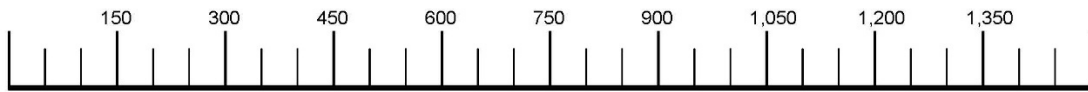




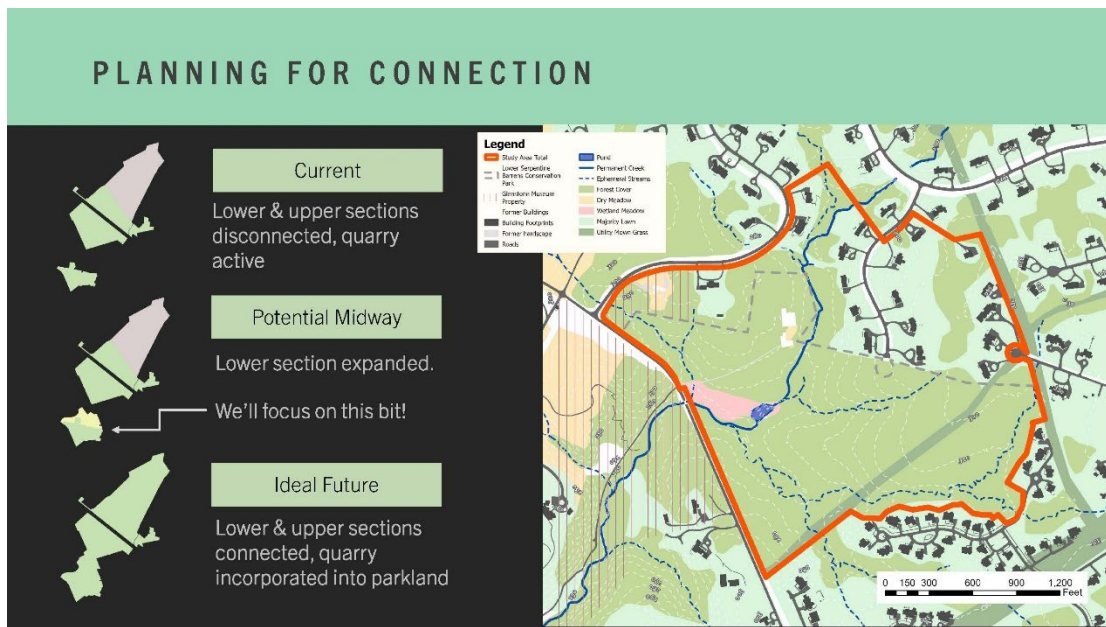
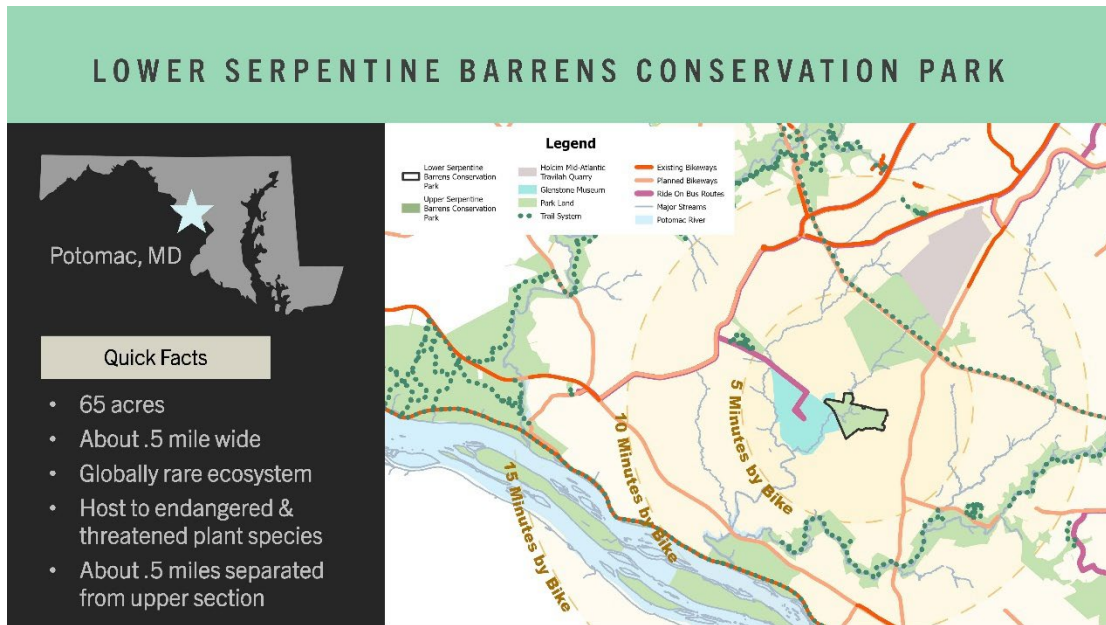
Appendix H: Design Workshop Printed Supplemental Materials



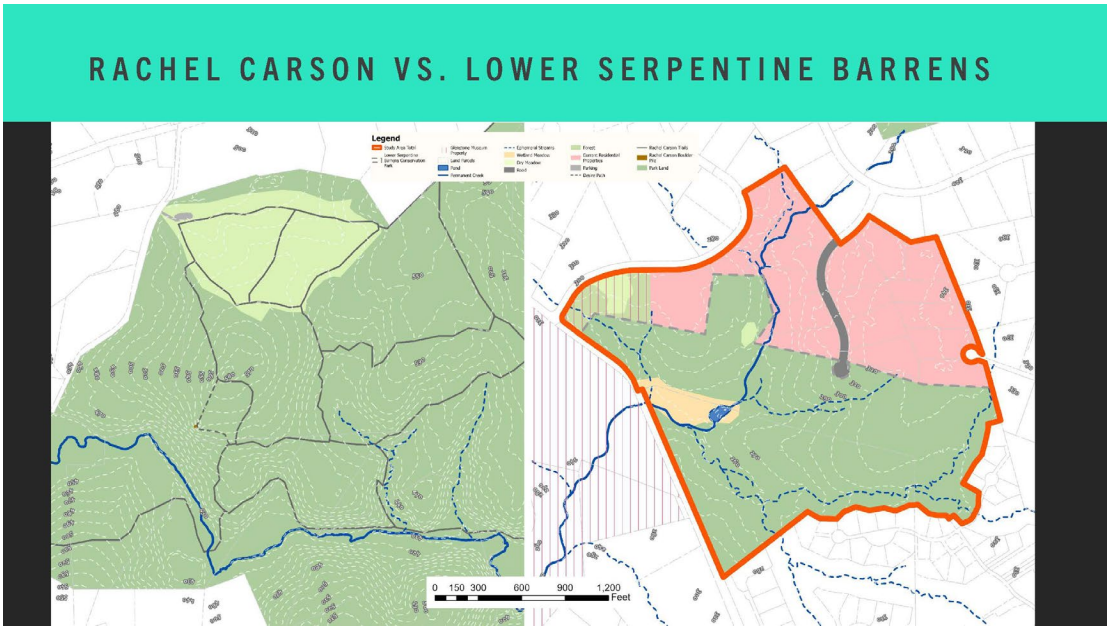
Pre-Scaled Rulers. These pages were printed and cut into individual rulers.



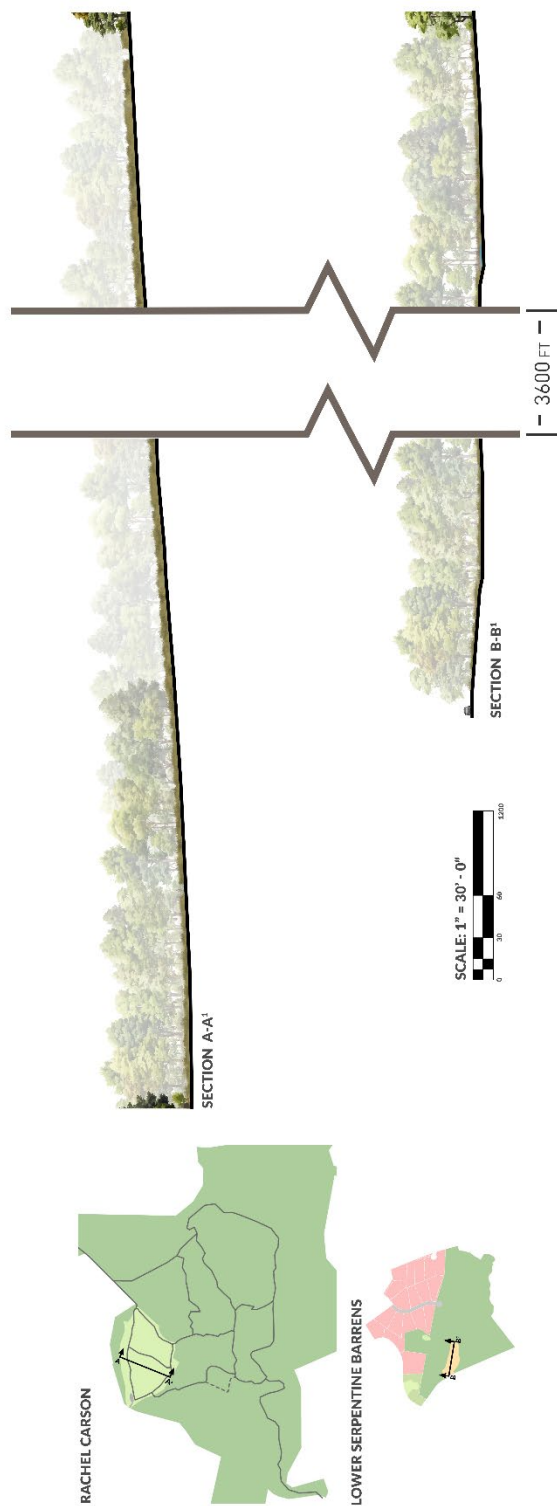
Appendix I: Design Workshop Introduction: LSBCP Site Context



Appendix J: Comparing Rachel Carson CP and LSBCP

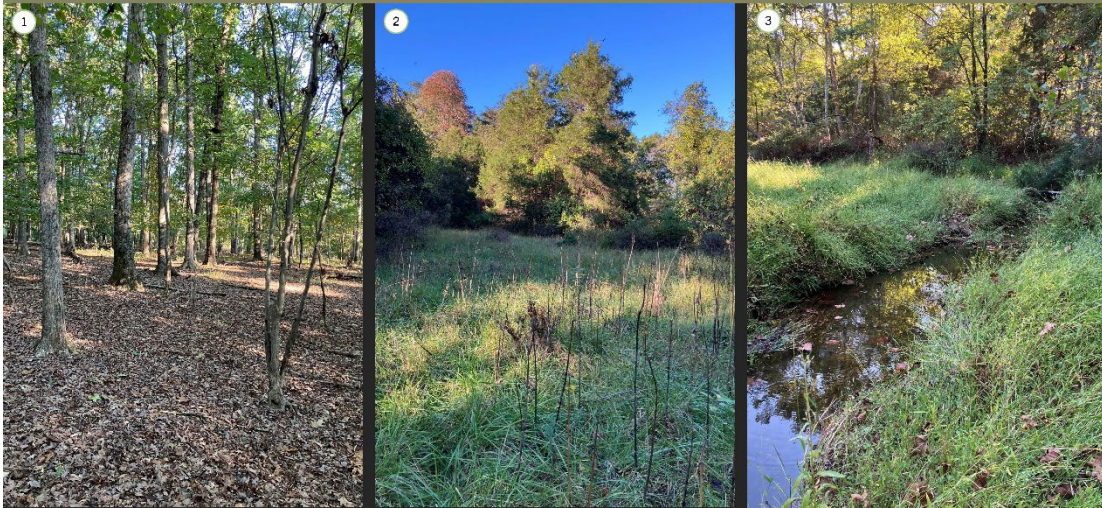


Appendix K: Design Workshop Comparative Sections

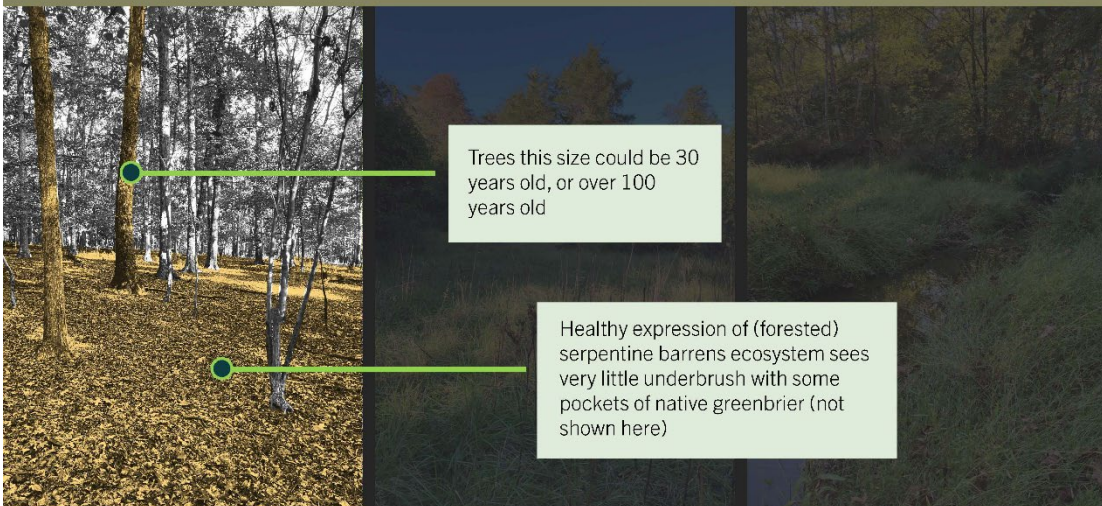


Appendix L: Analysis of Three Archetypal Landscapes

SERPENTINE BARRENS SITE IN PHOTOS



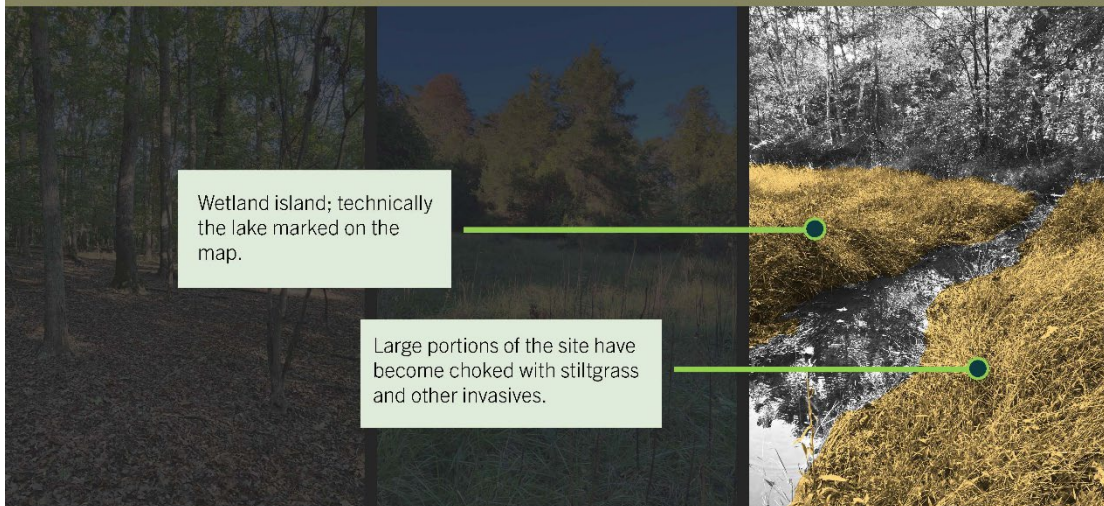
SERPENTINE BARRENS SITE IN PHOTOS



SERPENTINE BARRENS SITE IN PHOTOS



SERPENTINE BARRENS SITE IN PHOTOS



Appendix M: Design Workshop Concept Design

Feedback Questions

Note: Questions that were asked are bolded.

What stood out to you the most in the comparison between Rachel Carson and the Lower Serpentine Barrens?

Was there anything surprising?

Has any of this information made you think back on the audit walks differently?

How do you think the differences between Lower Serpentine and Rachel Carson might impact how you feel about these spaces?

What stands out to you from the two concept diagrams?

What aspects of these designs do you like the most? What are you most drawn to?

Is there anything that you think would not work?

Do you like the idea of including meadow restoration?

Do you prefer the design with more forest, or the design with more meadow?

Which of the welcome center locations appeal to you most?

Which of the two welcome centers contain features you find most interesting?

Which of the trail stopping points are you most interested in?

Which of stopping points have the most interesting location for you?

Do you prefer the design with more swings and other features that move, or the design more focused on looking at the environment around you?

Appendix N: Design Workshop Park Visualization

Exercise Script

Close your eyes.

Think back to a memory of a park that's meaningful to you. Somewhere you think of often, or stand out to you in some way.

Think back to your memory of being in that space. Where are you?

What can you see around you? Are you closed in, or can you see far into the distance?

Are you in a forest? On a mountain? On water? In the desert?

Is there someone with you? Or are you experiencing this on your own?

What are you doing? Are you walking? Are you sitting, maybe enjoying a view, or maybe having lunch?

If you are moving, where are you going? Do you have a destination in mind? A goal? Or are you wandering?

If you are sitting, what are you sitting on? Is it a bench? A rock? A boat?

What do you hear around you? Are there birds singing? Are there crunching leaves? Are there children playing? Is it loud here, or quiet?

Think back to the feel of the air on your skin. Is it cool, or warm? What time of year is it?

What do you smell here? Is there a fragrance that you notice? Is it pleasant? Unpleasant?

How long do you plan to stay in this park? Minutes? An hour? All day? What will you do with that time? What would you do here if you could stay longer, or return?

Hold that memory of this park in your mind a moment longer. And when you are ready, open your eyes.

Appendix O: Design Workshop Writing Activity
Instructions

ACTIVITY 1: PERFECT DAY INSTRUCTIONS

WORK ON YOUR OWN: 20 MINUTES

PROMPT:

What would be your perfect day at the Lower Serpentine Barrens Conservation Park?

Consider: What time of year is it? Who are you with? What are you doing? What are you seeing? Where are you going?



Write a Short Narrative.

Use the worksheet to write a short story of your perfect day in the park. You can use one of the example park plans as a basis or you can come up with your own ideas for what is in the park and how it looks.

If you don't have enough space on the worksheet, you can continue on the back or use a second page.

At the end of the 20 minutes, staple all of your pages together and leave them on the table.

Remember: You only have 20 minutes! If you find yourself running out of time but have more to say, you can outline the rest of your story instead of writing in full sentences.

Appendix P: Design Workshop Writing Activity Sheet

Narrative Title:

--

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Appendix Q: Design Workshop Visual Arts

Activity Instructions

ACTIVITY 2: MAKE A DESIGN INSTRUCTIONS

WORK ON YOUR OWN: 20 MINUTES

PROMPT:

Design an element, space, or structure for the Lower Serpentine Barrens Conservation Park. It can be something as small as a single sign or as large as an amphitheater.

Consider: Where is it? How big is it? How should it be used? Who is it designed for? What material or materials is it made or built from? How often will it be used?

Create a 2D or 3D Representation of Your Design.



Make a model: Use any of the modeling supplies (clay, pipe cleaners, toothpicks, coffee stirrers) to create a 3D model. Use a worksheet to log the details about your design, including what it is, what materials it would be made out of, and where you would put it.

At the end of the 20 minutes, place your model on top of your worksheet and leave them on the display table.

OR



Draw a picture or diagram: Use markers, colored pencils, and/or pens to draw a picture or diagram of your design on a worksheet. Make sure to label the parts of your design and notate additional details such as what materials it would be made out of, and where you would put it.

At the end of the 20 minutes, place your worksheet on the display table.

Remember: You only have 20 minutes!

Appendix R: Design Workshop Visual Arts Activity Sheet

Design Title:

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Design Notes (Materials/Location/Use/Parts/Etc) - Continue on the back or a separate page if needed.

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Design:

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Appendix S: Design Workshop Small Group Brainstorm
Activity Instructions

ACTIVITY 3: PARK EVENT

INSTRUCTIONS

COLLABORATE IN A GROUP: 20 MINUTES

PROMPT:

Plan an event to take place in the Lower Serpentine Barrens Conservation Park.

Consider: What type of event is it? Who do you want to attract to the event? What time of year will it take place? How long will it go (hours? days? weeks?)? What activities will it include? What kind of spaces do need within the park to host these activities? Where in the park will it take place/how much of the park will be involved?



Work Together as a Group to Design Your Event.

Use the worksheet as a guide to design the where/what/when/how/whys of your event.



Make sure to take notes as you go. You can use the sticky notes and extra paper to note or sketch out ideas as you discuss.

At the end of the 20 minutes, tape or staple all related notes/sketches to the worksheet. Leave this packet on the table.

Remember: You only have 20 minutes, so you don't need to get too detailed!

Appendix T: Design Workshop Small Group Brainstorm Activity Sheet

Event Name:

People in your group

Event Description:

When would the event take place? How long will it last? Where in the park will it take place?

Who is it for? How far will they travel? How will they get there? How long will they stay?

What activities will be included? What spaces or structures are needed to host these activities?

Appendix U: Demographic Survey Questions

Demographic information

What is your age? []

Please select any that apply:

- I have been diagnosed or have self-identified as Autistic
I have been diagnosed or have self-identified as having ADHD
I have been diagnosed or have self-identified as dyslexic
None of the above
I prefer not to say

Please select all that apply:

- I have one or more close family members who are Autistic
- I have one or more close family members who have ADHD
- I have one or more close family members who are dyslexic
- The purpose of my work is to give service or support to Autistic individuals
- The purpose of my work is to give service or support to individuals with ADHD
- The purpose of my work is to give service or support to dyslexic individuals
- None of the above
- I prefer not to say

Are you Hispanic, Latino, or Spanish origin?

- Yes
- No

What is your race? []

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