Ecocriticism, Colonial Legacies,
and the Broadleaf Plantain in Urban Spaces

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Abstract

This research examines the intricate relationship between humans and nature in urban environments, with a focus on the Broadleaf Plantain. Drawing on theories such as Postcolonial Ecocriticism (Banerjee, 2016), Cultural Ecology (Zapf, 2016), the More Than Human from Tsing (2015) and Kimmerer (2013), as well as insights into Hybridity and Co(a)gency from Michael (2002) and Haraway (1991), and the concept of "naturecultures" (Latimer & Miele, 2013), it aims to understand ecological dynamics and challenge colonial perceptions of the environment. Utilizing a research-creation methodology, it integrates theoretical frameworks with practical engagement to bridge the gap between theory and practice. This facilitates a holistic understanding and encourages embodied learning, fostering a profound connection between the researcher and the environment under study. Employing various research methods such as fieldwork, observations, visual documentation, reflexivity, and prototyping, the research explores how ecocritical installations can decolonize perceptions of nature. Furthermore, the study delves into the historical and contemporary significance of Broadleaf Plantain, highlighting its resilience and adaptability amidst human-induced environmental changes. The study hopes to empower communities to forge deeper connections with their urban environments, shed light on indigenous ways of knowing, and elevate the significance of plants within ecological discourse and environmental stewardship. The project concludes with the creation of a series of prototypes, functioning as artistic statements to spark socio-political dialogues, and prompt contemplation on human interventions in the environment, and the absurdity of controlling nature amid the climate crisis.

Acknowledgment

I want to begin by acknowledging the ancestral and traditional territories of the Mississaugas of the Credit, the Haudenosaunee, the Anishinaabe, and the Huron-Wendat, who are the original owners and custodians of the land on which we stand and create. I am also incredibly grateful for the opportunity to live, work, and learn on this land as a foreign student. Being able to engage with the rich cultural heritage and traditions of this territory has been a profound and enriching experience for me that I will always cherish.

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To the Broadleaf Plantain

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Introduction

Amid bustling cities like Toronto, there's a quiet story unfolding—one of resilience and adaptation, embodied by the Broadleaf Plantain, a seemingly ubiquitous yet often overlooked plant species found thriving in urban spaces. In this research I dive into that tale, exploring the complex relationship between humans and nature in urban landscapes, with the Broadleaf Plantain as a guide. I am not just interested in the plant itself; I am fascinated by what it represents—a challenge to preconceived notions of control and dominance over the natural world. By exploring its ecological characteristics, adaptive strategies, its historical and contemporary significance in the face of human-induced environmental changes, I shed light on the plant's role in urban ecosystems.

Through this study, I aspire to empower communities to establish deeper bonds with their urban surroundings, while simultaneously highlighting indigenous ways of knowing and elevating the significance of plants within ecological discourse and environmental stewardship. I aim to explore how ecocritical installations can act as catalysts for decolonization, reshaping our perceptions of the environment in the face of the climate crisis.

I start by conducting a comprehensive literature and contextual review relying on diverse theoretical frameworks. I explore the intersection of Ecocriticism, Cultural Ecology, and Postcolonialism, referencing the works of Zapf (2016) and Banerjee (2016). I delve into the topic of decolonizing perceptions of nature, and what it entails, shedding light on the contrasting perspectives between Western and Indigenous ways of perceiving and interacting with the environment, drawing from authors such as Kimmerer (2020), Latimer & Miele (2013), Demos (2016), and Haraway (2016). I rely on the works of Richardson & Pyšek (2012), Hawthorn (1974), Kirksey (2015), and Tsing (2015) to conduct an extensive investigation into Broadleaf Plantain in the Urban Space, focusing on its categorization as a

naturalized species and its ecological significance within urban ecosystems. Another layer of inquiry that I am interested in is the dynamic relationship between humans, plants, and technology in ecological discourse, looking into collaborative efforts among these three components in addressing environmental challenges. I explore the works of Haraway (1991), Michael (2002), Gould (2021), and Lewis et al. (2018) to inform this inquiry. Finally, I conclude my review with a detailed case study of five different works that constitute ecocritical installations, including Biersteker's (2022) *Econario*, Alves' (1999-present) *Seeds of Change,* Biemann's (2021) *Forest Mind*, Tsing et al. (2020) *Feral Atlas*, and Esparza's (2014) *Nomadic Plants*. These case studies provide valuable insights into how artistic interventions can contribute to environmental discourse and stimulate dialogue about human-nature relationships in contemporary society.

My exploration doesn't just rely on theoretical foundations, it depends on practical engagement too. I adopt a research-creation approach, integrating various methods informed by Chapman & Sawchuk's (2012) categorization of research-creation modes. Drawing inspiration from Simpson's (2017) advocacy for Indigenous knowledge systems, particularly land-based pedagogies, I approach my research with deep respect for diverse ways of knowing (pp. 158-170).

In fieldwork, I engage in land stewardship activities, including invasive species management and native species planting, to develop a reciprocal relationship with the land. This hands-on approach challenges my perceptions and biases while fostering gratitude and connection to the environment. By focusing on the Broadleaf Plantain, I navigate ethical considerations of foraging in urban spaces, reflecting on societal attitudes towards plants and hidden narratives within urban landscapes.

I adopt an observational approach, influenced by Despret's concept of "affected perspectives", which allows for a more intimate understanding of the Broadleaf Plantain's behavior and adaptability (as cited in Latimer & Miele, 2013, pp. 12-14). Observations conducted both at home and in outdoor urban spaces reveal the plant's ecological roles and interactions, enriching my understanding of its intelligence and resilience.

I use visual documentation that complements written descriptions, providing additional layers of understanding and context. Through photographs, videos, and installations, I aim to create immersive experiences and evoke emotional responses, fostering a deeper connection with the research subject and narratives.

I incorporate reflexivity, inspired by Gray & Malin's (2004) framework, facilitating personal and intellectual growth by acknowledging biases, ethical considerations, and interactions with the research subject and environment (p. 74). Utilizing reflective journaling serves as a dynamic repository for documenting progress, experiences, and emotions, contributing to transparent and accountable research practice.

The project culminates in an exhibition featuring a series of prototypes that highlight various aspects of Broadleaf Plantain. The "Plant Incubator" prototype, a technological apparatus, highlights the plant's significance in a colonial setting. The "Mobile Plant" prototype embodies the plant's migratory nature alongside settlers, prompting reflection on human-plant interactions. The "Poultice-Making Kit" delves into the plant's healing properties and potential commodification, while the "Broadleaf Plantain Map" provides a comprehensive visual representation of its anthropogenic ecosystem. Together, these prototypes form a cohesive narrative that aims to engage viewers by connecting them to the plant's history and ecological significance, prompting reflection on personal biases and perceptions of the plant and the environment.

The exhibition challenges colonial influences by encouraging critical inquiry into topics such as the commodification of nature and the role of technology in ecological discourse. Through interactive displays and artistic installations, it seeks to spark meaningful conversations and inspire action toward more sustainable and equitable relationships with the natural world.

1.1. About the Research

It all stems from my regular walks around Toronto, where I often notice plants pushing through concrete sidewalks, parking lots, neglected buildings, construction sites, etc. These resilient green patches aren't unique to Toronto alone; I've noticed them in every city I've visited. It’s as if nature made itself present in cities the same way everywhere despite the constant governmental efforts to meticulously plan and integrate green spaces into urban landscapes. What captivates me the most about these plants, is how they seem to embody the intricate relationship between nature and the built environment. These plants are often burned by road salts, trampled by passers-by, urinated on by dogs, and uprooted by construction trucks. Rather than merely existing alongside humans, they thrive in the midst of ongoing disturbances, revealing an innate ability to adapt and coexist within urban settings.

One day, I decided to investigate by taking pictures of these plants around my neighborhood in Toronto. I did a reverse image search online familiarizing myself with the names of these plants and how they made themselves present in the urban space. Amongst them was the Broadleaf Plantain, scientifically known as Plantago Major, a perennial plant from the Plantaginaceae family. It can establish itself in all types of soil and it intermittently germinates from late April to late September with peak flushes in May. Plantain creates a basal rosette composed of large oval-shaped leaves marked by prominent leaf veins. Above this rosette grows a taller flower spike adorned with numerous small flowers. (Ontario, 2023)

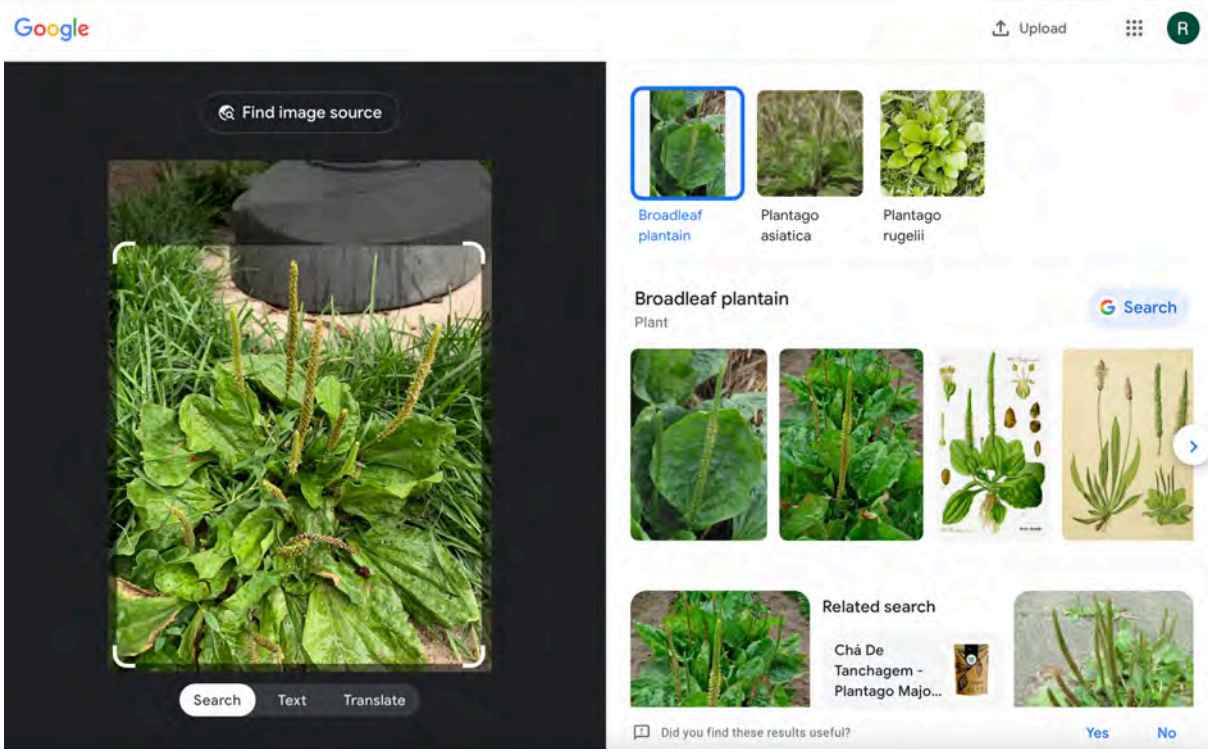

Figure 01 — Reverse image search identifying Broadleaf Plantain

During my investigation of the Broadleaf Plantain, I noted various points of view regarding the perception of the plant. For some, it was seen as a nuisance, labeled as a colonizer, and a threat to their backyards. Yet, institutions like Urban Forest Management, and Invasive Species Center in Ontario classify plantain as a naturalized species, considering it relatively harmless compared to what they categorized as more aggressive invaders like Garlic Mustard, Dog-Strangling Vine, and Common Buckthorn. Their approach to managing invasive species varies based on several factors, including organizational priorities and capacity for monitoring and control. While some species' impacts are unmistakable and universally recognized, such as those deemed threats by both the City of Toronto and the Invasive Species Center, others, like the Broadleaf Plantain, are viewed differently depending on where and how the plant presents itself. (Invasive Species Center, 2024; City of Toronto, 2023)

Similarly, in the case of High Park Nature Centre, for instance, the Broadleaf Plantain is not considered a significant threat, and the organization prioritizes other species for management and monitoring. (High Park Nature Centre, 2023) However, in my friend's backyard, the plant is considered undesirable for several reasons. It is first considered a weed due to its low-growing habit and broad leaves. Its presence in a backyard detracts from the desired aesthetic of what is generally considered a polished garden. The plant is a vigorous grower and can compete with other perhaps more desired plants for resources such as water, and nutrients. In favorable conditions, it can spread rapidly forming dense patches that are difficult to eradicate. An occurrence I have observed widely around the city.

I learned that Broadleaf Plantain is native to Eurasia and made its way to Canada, through the travels of the European settlers. (Rousseau, 1968, as cited in Hawthorn, 1974) This highlights how colonialism not only involved the physical displacement of people and the imposition of new governance structures but also fundamentally altered landscapes and ecosystems. The introduction of non-native species like the Broadleaf Plantain is a tangible manifestation of this ecological transformation. This made me interested in investigating how the plant was perceived by indigenous communities. According to Meeker et al. (1993), the Ojibwa people integrated common plantain into their medicinal practices. They used chopped fresh leaves as a poultice to address issues such as rheumatism. The poultices from chopped roots or leaves were used to treat dermatological issues, snake bites, bruises, sprains, and sores. The plant’s powdered root was also carried as a protective charm against snake bites. (p. 119) Additionally, as mentioned by Kimmerer (2020) in their book *Braiding Sweetgrass*, Plantago Major specifically presented an opportunity to learn how to belong and be in a place we are not native to. (p. 214) This inspired me to put Broadleaf

Plantain at the center of my research as it presented an interesting learning point especially when it comes to perceptions of the environment.

1.2. My Position & Context of this Research

Tsing, Deger, Saxena, and Zhou (2020) argue in *Feral Atlas* that in this day and age, there is a prevailing belief that humans can surpass and control nature, instead of collaboratively coexisting with nonhuman entities. They state that the discourse surrounding the Anthropocene, framing it as an era marked by human-induced environmental challenges, encourages a departure from these entrenched thought patterns. The once-perceived mastery of humans over nature no longer appears to be winning; it prompts a reevaluation of the interconnected histories of human and nonhuman entities. This way of thinking reflects colonial ideologies that assert human dominance and control over nature. It perpetuates the notion of human exceptionalism, wherein humans are believed to have the right and ability to transcend and manipulate the natural world for their benefit.

As we navigate the challenges of the Anthropocene, embracing diverse perspectives and honoring the resilience of both human and nonhuman actors will be essential in shaping sustainable and inclusive futures. (Tsing, 2015) Ultimately, this research journey has not only deepened my understanding of the ecological intricacies of Broadleaf Plantain but has also underscored the importance of critically examining the colonial legacies that continue to shape our relationship with nature. By interrogating these legacies and amplifying diverse perspectives, we can foster more inclusive and equitable approaches to environmental conservation and climate action, grounded in respect for both human and non-human communities.

Among the multitude of pressing issues we are currently facing, the environmental crisis stands out to me as a problem that transcends the scientific boundaries it is often

assigned. In their work *Why We Disagree About Climate Change*, Mike Hulme argues that the controversy surrounding climate change is rooted in a misunderstanding of scientific uncertainty, particularly a lack of understanding about what uncertainty truly means in the scientific context. Divergent perspectives and values further contribute to this discord, shaping how different individuals interpret scientific data, risks, and the resilience of the non-human world. The environmental crisis, in particular, extends beyond ecological concerns alone, encompassing social, political, economic, cultural, and ethical dimensions. It impacts diverse human and non-human communities disparately across generations. Hulme advocates for nuanced discussions that move beyond simplistic dichotomies of "good versus bad" prevalent in climate change discourse, emphasizing the need to acknowledge the multiple perspectives and values at play. (Hulme, 2009)

Naomi Klein's *This Changes Everything* further highlights the political obstacles preventing effective responses to the urgent global threat. Klein argues that although we have the technology and concepts to reduce carbon emissions, the crucial element lacking is the determination to act. They call for a departure from established economic models and cultural beliefs, stressing the necessity for a significant change in how we relate to nature. By emphasizing the necessity of reevaluating our societal norms and values, Klein underscores the need to forge a more harmonious and sustainable coexistence with nature. (Klein, 2014)

Therefore, it is important to establish effective environmental communication to empower individuals to tackle ecological crises. In my opinion, the realm of art presents a promising pathway for such communication. Art has the potential to convey scientific research in imaginative, engaging, and easily understandable ways, bridging gaps in understanding and fostering meaningful connections between individuals and environmental issues. Leveraging the power of art can trigger creative shifts in perception and philosophy,

offering new ways of understanding ourselves and our relationship with the world. Demos (2016) in *Decolonizing Nature Contemporary Art and the Politics of Ecology* suggests that art, known for its innovation and unconventional perspectives, can disrupt harmful legacies and colonial ideologies that uphold human supremacy over nature. They advocate for a shift away from solely critiquing economic and trade policies that prioritize profit over environmental well-being. Instead, Demos proposes a political decolonization of our understanding of nature, which involves challenging the influence of financial motives, reexamining the legal status of corporations, and advocating for legal frameworks that acknowledge and protect nature's inherent rights to exist (pp. 18-19).

As we're living in an Anthropogenic world, a world or environment that is significantly shaped, influenced, and altered by human activities, it becomes crucial to reflect on our role in shaping the environment. In the past couple of years, I started viewing research as a powerful tool within my practice. When I use the word "research," I adopt a similar approach as Herising (2005) in their chapter Interrupting Positions: Critical Thresholds and Queer Pro/Positions in the book *Research As Resistance,* where research means a critical, continuous, and dynamic process that involves ongoing social, historical, and political dialogues where subjects, disciplines, and practices undergo renewal, critical disruptions, and critical praxis. An approach that acknowledges differences and aims to change the privileged positions researchers may have. (p. 129)

As a designer who relocated to Toronto, Canada, to conduct research, I am aware of the pervasive influence of colonial ideologies and the potential biases embedded within my own perspectives. I approach my research journey with a commitment to critical self-awareness and introspection. This entails continuously interrogating my assumptions, biases, and positionalities, particularly in relation to power dynamics and cultural perspectives. By

acknowledging my own positionality and remaining open to diverse viewpoints, I strive to cultivate a more inclusive and ethical research practice. I extend reflexivity to my engagement with the non-human world, viewing entities like the Broadleaf Plantain as collaborators rather than passive subjects of study. This acknowledgment marked a significant shift in my research approach. This allowed me to let the plant guide my research journey, fostering a more respectful and reciprocal relationship. Through this lens, I strive to approach my research journey with integrity, humility, and dedication to forging meaningful connections between individuals and their environment.

1.3. Research Goals

This research project incorporates colonial, indigenous, and personal perspectives to explore the intricate relationship between human perceptions and environmental action. In addressing the challenges of the Anthropocene, it emphasizes the importance of embracing diverse viewpoints and recognizing the resilience of both human and nonhuman actors for shaping sustainable and inclusive futures. The aim is not only to deepen understanding of the ecological complexities of Broadleaf Plantain but also to critically examine colonial legacies that influence our relationship with nature. By interrogating these legacies and amplifying diverse perspectives, the research seeks to promote more inclusive and equitable approaches to environmental conservation and climate action, respecting both human and non-human communities. Given the urgency of the climate crisis, rigorous inquiry and innovative approaches are essential to mitigate its consequences and foster resilience. This research contributes by exploring human-nature interactions and offering insights to confront and adapt to the challenges posed by the climate crisis.

As Demos (2016) explains in *Decolonizing Nature Contemporary Art and the Politics of Ecology*. Colonialism has profoundly influenced our views of nature and our interactions

with the environment. The legacy of colonial ideologies perpetuates a worldview that prioritizes human domination and exploitation of nature, often at the expense of ecological integrity and other knowledge systems. This research critically examines these influences, advocating for the decolonization of environmental research and stewardship. By investigating the historical and ongoing impacts of colonialism on environmental understanding, the study aims to challenge existing power structures and amplify marginalized perspectives. Through a decolonial lens, it seeks to foster reciprocal relationships with the natural world and promote environmental justice.

1.4. Research Questions

Primary Research Question: Through the lens of the Broadleaf Plantain, how can ecocritical installations decolonize the way we perceive the environment in an urban setting?

The primary research question stems from the recognition of colonial legacies shaping perceptions of the environment. By focusing on ecocritical installations, the question aims to explore how artistic interventions can challenge dominant narratives and foster more inclusive ways of engaging with urban nature. This question is posed to address the need for decolonizing environmental discourse and promoting inclusive and sustainable urban ecosystems that respect diverse perspectives.

Secondary Research Questions: How can these installations challenge existing hierarchies established between the human and more-than-human world?
How can they spark socio-political conversations pertaining to the lingering effects of colonization in the context of the climate crisis?

These secondary questions build upon the primary inquiry by delving deeper into the transformative potential of ecocritical installations. They aim to investigate how these installations can disrupt hierarchical frameworks that prioritize human dominance over nature

and foster a more reciprocal relationship between humans and the more-than-human world. Additionally, they seek to explore how such interventions can serve as catalysts for socio-political discussions, particularly in addressing the intersection of colonial legacies and the climate crisis. These questions are posed to encourage critical reflection on power dynamics in urban environments.

The posed research questions are essential for framing the inquiry within broader environmental and social contexts. They address the need to decolonize environmental discourse and challenge hegemonic perspectives that perpetuate human exceptionalism and ecological exploitation.

1.5. Research Scope & Limitations

The timeline for this research imposes some limitations on what was accomplished. First, entering into this research endeavor, I was well aware of my own biases and positionality as a foreign student conducting research in Canada. Recognizing the importance of familiarizing myself with the local environment and the cultural nuances that shape interactions with it, I chose to connect my research directly to my everyday experiences. By doing so, I gained insights that may not have been very apparent from an outsider's perspective. It allowed me to develop a deeper understanding of the contextual factors influencing human-nature interactions, including societal norms, urban infrastructure, and community dynamics. Connecting my research to my everyday experiences facilitated a more organic and authentic exploration of the topic, grounded in lived experiences rather than just abstract theories or assumptions. This approach fostered a sense of connection and relevance to the research process, enhancing my motivation and investment in the project's outcomes.

Narrowing the scope of my research to the Broadleaf Plantain in the urban space of Toronto, Ontario, offered valuable insights into the dynamics of human-nature interactions

within my immediate surroundings. By focusing exclusively on one plant species and a specific geographical location, the applicability of my research findings to other settings and plant species may be constrained. The research was conducted in Toronto, a city in North America, which prompted me to rely on local indigenous knowledge systems to contrast with colonial perceptions of nature. This focus allowed me to explore the complex interplay between Western ideologies and Indigenous perspectives on the environment within a specific cultural and historical context. However, I acknowledge that numerous other knowledge systems around the world could enrich this research. Due to time constraints and the need for in-depth analysis, I chose to prioritize the history and cultures related to the North American setting. As a result, my findings may not fully capture the diverse range of perspectives and experiences from other geographical regions and cultural backgrounds.

Lastly, the project's reliance on live plants presented practical challenges, particularly during the winter months when Broadleaf Plantain is dormant and not readily available outdoors. My lack of familiarity with plant care posed an additional obstacle, requiring a steep learning curve and necessitating a trial-and-error approach. Despite these challenges, maintaining a close connection with the plant throughout the research process was crucial for gaining insights into its ecological significance and resilience in urban environments.

The limitations encountered throughout this research journey serve as important reflections of my place within the broader, non-human environment. As humans, the colonial mindset often leads us to impose our worldview and practices broadly on the places we inhabit, disregarding the unique mix of relationships that characterize each environment. Viewing these limitations as outcomes rather than constraints of the research process, I embraced them as opportunities to deepen my understanding of human-nature interactions.

2.0. Literature & Contextual Review

The literature and contextual review provides a theoretical foundation for my research by integrating diverse theoretical frameworks. It helps frame the research questions and guide the exploration of the complex relationship between humans and nature in urban landscapes, with the Broadleaf Plantain as a focal point. The review sheds light on the contrasting perspectives between Western and Indigenous ways of perceiving and interacting with the environment deepening understanding of the socio-cultural contexts influencing human-nature relationships. It investigates the ecological significance of Broadleaf Plantain in urban spaces, drawing from the works of ecological experts. This exploration helps in understanding the plant's role within urban ecosystems and its adaptation strategies amidst human-induced environmental changes. Furthermore, the review examines the dynamic relationships between humans, plants, and technology in ecological discourse, highlighting collaborative efforts among these components in addressing environmental challenges. By exploring case studies of ecocritical installations, the review also provides insights into how artistic interventions contribute to environmental discourse and stimulate dialogue about human-nature relationships in contemporary society.

2.1. Ecocriticism and Decolonization

Ecocriticism is an interdisciplinary field that emerged in the late twentieth century. It initially focused on literature and culture related to nature writing, wilderness narratives, and romantic nature poetry. It sought to reintroduce environmental values into the study of literature, offering a lens through which we can analyze literary, cultural, and artistic representations of nature. According to Zapf (2016), in the introduction of *Handbook of Ecocriticism*, over the past two decades, the field has expanded significantly in scope and interdisciplinary reach, encompassing various disciplines, media, art forms, and knowledge

cultures under the umbrella term of environmental humanities. The author talks about its potential to offer new perspectives on scholarly work and to counterbalance dominant neoliberal and technoscientific paradigms. They contend that ecocriticism aims to explore sustainable cultural alternatives to purely economic or technoscientific visions of globalization and humanity's future on the planet. (pp. 1-5)

Zapf (2016) discusses that when ecocriticism draws from cultural ecology, which in turn investigates how cultural beliefs, practices, and institutions shape human interactions with the environment, it helps us understand how natural and cultural ecosystems are interconnected (p. 3). They suggest that ecocriticism should not only focus on the relationship between texts and external natural ecosystems. They explain that it should also delve into the cultural realms of language, literature, and other artistic expressions from three fundamental angles: their co-evolutionary relationship with natural ecosystems, their interactive and reciprocal influences with other cultural domains, and their self-organizing nature. This emphasizes the need to think about natural and cultural ecologies together without reducing one to the other, acknowledging their differences and interrelatedness. The conjunction of ecocriticism and cultural ecology extends the field's definition by including philosophical, theoretical, and eco-aesthetic perspectives not just from continental Europe, but also by facilitating transcultural dialogues with non-Western ecological knowledge cultures worldwide. (p. 4)

By challenging anthropocentrism, also known as “human-centeredness,” which dominates Western cultural narratives, and analyzing cultural representations of the environment across various media such as literature, film, and popular culture, ecocriticism shares common ground with postcolonial studies. As highlighted by Banerjee (2016), they both advocate for global awareness and activism, recognizing the interconnectedness of

environmental and social issues on a global scale. Postcolonial studies often delve into past colonial legacies and their enduring impacts. They emerged in the aftermath of the independence movements of former European colonies, particularly in countries like India, Africa, and the Caribbean. They aimed to challenge the notion of European cultural superiority and rewrite the histories of these newly independent nations. This movement involved a reclamation of cultural and literary narratives by the formerly colonized peoples, often referred to as “writing back” to the colonial center. However, ecocriticism looks ahead, focusing on the sustainability of human societies and the planet. Despite this temporal disparity, both fields share a common objective: fostering critical awareness and advocating for transformative changes in cultural and political perspectives. (pp. 194-195)

Banerjee (2016) states that recent scholarship started recognizing that postcolonialism and ecocriticism can complement each other. For example, they state that postcolonial critics have frequently explored the metaphors of land and geography in literature but have often overlooked their ecological dimensions. Here, the author discusses the concept of witnessing as central to the postcolonial project, where addressing and rectifying the injustices of the colonial past necessitates bearing witness to cultural, economic, and environmental devastation. However, colonialism's violence often silenced the witnesses, leaving the land as the sole spectator of history. In this case, ecocritical readings offer another layer of meaning by restoring agency to the land, which may have been muted within the human-centered framework of postcolonial studies. (p. 196) Ecocriticism shifts focus from the metaphorical to the material, balancing human and non-human environments and contributing to what is termed the 'greening' of postcolonialism. (Huggan and Tiffin, 2010, as cited in Banerjee, 2016, p. 196).

While postcolonialism has sometimes overlooked the ecocritical dimensions of its foundational texts, ecocriticism has also tended to neglect the Eurocentric aspects of its discourse. (DeLoughrey and Handley 2011, Vital 2008, as cited in Banerjee, 2016, p. 197). The author argues that ecocriticism has perpetuated a distorted narrative, blaming non-Western countries for neglecting environmental concerns, thus articulating what Larry Lohmann terms “Green Orientalism”. DeLoughrey and Handley argue that this blame is misplaced and reflects a distortion of reality. They suggest that this narrative creates a “normative ecological subject” that obscures its Western origins, perpetuating a form of environmental orientalism. This perspective accuses non-Western societies of hindering global ecological balance and progress. (as cited in Banerjee, 2016, p. 197) Additionally, ecocritics have sometimes romanticized indigenous cultures, portraying them as inherently ecologically virtuous. However, this view oversimplifies indigenous communities, ignoring their historical complexities and achievements, as highlighted by Allen. Allen emphasizes the need to acknowledge the economic, cultural, and architectural sophistication of indigenous societies while also integrating environmental concerns into discussions of their cultures. This critique underscores the importance of understanding the multifaceted nature of indigenous communities and integrating environmental considerations into cultural analyses. (as cited in Banerjee, 2016, pp. 197-198)

There is a significant gap in the individual approaches of postcolonial studies and ecocriticism, particularly concerning their ability to address the dominance of economic interests. In essence, both fields struggle to confront the influence of capitalism on environmental issues adequately. Rob Nixon's critique adds depth to this observation by revealing how ecocriticism, in particular, tends to prioritize Western perspectives and overlook environmental injustices in non-Western contexts. This bias underscores a broader

disconnect between the scholarly discourse of Western ecocriticism, which often celebrates environmental achievements, and the harsh realities of ecological destruction experienced in many non-Western regions. (as cited in Banerjee, 2016, p. 199) The emergence of postcolonial ecocriticism represents an attempt to bridge this gap and address the complexities of power dynamics, exploitation, and environmental justice in the postcolonial world. By acknowledging the limitations of each field in isolation, this interdisciplinary approach seeks to overcome them by drawing on their respective strengths and insights. (Banerjee, 2016, p. 199)

The interdisciplinary discourse between ecocriticism and postcolonial studies offers profound insights into the complex relationship between culture, ecology, and power dynamics. Moreover, it's important to recognize that these fields intersect with a multitude of other areas, such as ecofeminism, biopiracy, indigenous rights, biosemiotics, etc. Each of these domains contributes unique insights into these complex relationships. However, due to the scope of this research, delving deeply into these interconnected topics may not be feasible. Nonetheless, acknowledging their relevance underscores the multifaceted nature of environmental and postcolonial discourses and highlights the potential for future investigations. By integrating both ecocriticism and postcolonial studies into my theoretical approach, I can investigate how ecocritical installations challenge dominant Western perspectives of nature as a resource to be exploited and controlled. Instead, these artworks may offer alternative narratives that foreground indigenous and marginalized voices, re-centering relationships with the land based on reciprocity, respect, and stewardship. Furthermore, this interdisciplinary approach can shed light on the ways in which ecocritical installations contribute to broader movements of environmental justice and decolonization, by promoting alternative ways of being in the world.

2.2. Decolonizing Perceptions of Nature

Our own cultural perspectives influence how we perceive and talk about the natural world, in the article *Naturecultures? Science, Affect and the Non-Human*, Latimer & Miele (2013) use the term "naturecultures", popularized by Donna Haraway, to emphasize the inseparable entanglement of nature and culture. It challenges the traditional dichotomy between nature and culture, suggesting that they are not separate entities but rather co-constitutive. It suggests that human beings are not simply products of nature or culture but rather sites where these intersect. This challenges the idea that nature is purely objective and separate from human influence, highlighting instead the cultural and historical contexts that shape our understanding of the natural world. Thus they shouldn't be treated independently. (pp. 11-12) Furthermore, Latimer & Miele (2013), explain that the term "nature" for example is not a universal or inherent concept that exists independently of human influence. Instead, it is shaped by the cultural beliefs, values, and norms of a society. Different cultures may have different interpretations of what is considered natural, influenced by their unique worldviews and traditions. They point out how the material world and how we use its resources affect what's considered natural. Our technology for instance can influence how we interact with the environment, and the availability of resources can change how we perceive and understand nature. Government decisions, laws, and power dynamics also significantly influence our perception of the environment. Political choices dictate which parts of the environment receive protection, exploitation, or alteration, thereby shaping our conception of what is natural. (pp. 10-12)

Kimmerer (2013) writes in the book entitled *Braiding Sweetgrass*, "In the Western tradition, there is a recognized hierarchy of beings, with, of course, the human being on top—the pinnacle of evolution, the darling of Creation—and the plants at the bottom." They

contrast this with indigenous knowledge that is centered around the idea that all beings on earth are interconnected and hold their unique wisdom. They explain how humans should, instead of viewing themselves as superior, understand their role within the intricate web of life and learn from the wisdom of other species to have a more balanced and respectful relationship with nature. (p. 9) One of the things that amplifies this separation of humans from nature, is what Kimmerer called “species loneliness”, a term they used to describe the separation that people experience from the natural world and other species that often leads to a feeling of loneliness. This alienation is exacerbated by the lack of familiarity with the environment, starting with simply the naming of species. “Names are the way we humans build our relationships”, most of the time when we refer to species including plants using their scientific names, many people stop exploring them. (p. 208) Broadleaf Plantain for example has different names, it is scientifically known as Plantago Major, but also called Common Plantain, Greater Plantain, and White Man’s Foot by the tribes of eastern North America. Each name is connected to different perceptions and histories. “White Man's Foot” is a name that reflects the idea that this plant often appeared in disturbed or colonized areas, following the footsteps of European settlers. (Meeker et al., 1993, p. 119) It highlights the entanglement of nature, culture, and history. Therefore, language plays an important role in shaping people’s perception of nature.

Demos writes in his book *Decolonizing Nature: Contemporary Art and the Politics of Ecology* about the objectification of nature that pushed us to look at nature as something to be exploited to cater to human needs. As a matter of fact, they reference Latour and Morton’s criticism of the traditional Western concept of nature. They view this concept as constituting an “ahistorical monolith”, referring to the Western conceptualization of nature as a static, unchanging entity devoid of historical context or evolution. In this view, nature is perceived

as an eternal, timeless force, disconnected from human influence or historical processes. This perspective neglects the dynamic and evolving relationship between humans and the environment over time, overlooking the ways in which social, cultural, and historical factors shape human interactions with nature. That reinforces humans' separation from nature, and supports Demos' argument that the conventional definition of nature is flawed because it relies on ontological objectification and dualistic thinking, which forms the conceptual foundation for extractive practices. The scholar advocating for ecology without nature aims to challenge current representational forms encouraging the exploitation of the environment. Additionally, they criticize its ideological manipulations, particularly when it is used to naturalize, fix, and dominate. While Demos doesn't entirely agree with theorists about the rejection of the term nature, they emphasize that "nature" still holds significance in the context of contemporary Indigenous and environmentalist activism. These movements emphasize the idea that humans are not separate from nature but are deeply interconnected with and central to the natural world. (as cited in Demos, 2016, pp. 20-21) This aligns with Haraway's (2016) writings about "Cheap Nature" which has allowed for the exploitation of natural resources throughout time. They argue that this era of cheap nature is coming to an end due to the depletion of Earth's reserves and the severe environmental consequences of resource extraction. (p. 100) The author also introduces the "Chthulucene" as an alternative to the Anthropocene, the current geological epoch, characterized by significant human impact on Earth's geology and ecosystems, particularly through industrialization, urbanization, and environmental changes, and as a way to describe the current and future time-spaces where people and other species exist in complex, interconnected relationships. The term is a concept rooted in Greek roots that signifies a time and place for grappling with the challenges of existence on a damaged Earth. The term combines "khthôn" (earth) and "kainos" (now or a

time of beginnings). "Kainos" represents a time of ongoingness, freshness, and potential, where past, present, and future coexist without erasure. It emphasizes the thick, ongoing presence of beings intertwined with various temporalities and materialities. Chthonic beings, on the other hand, are earthly entities characterized by their ancient yet contemporary nature. They are depicted as beings with tentacles and other appendages, symbolizing their intimate connection with the earth. Chthonic beings embody the material meaningfulness of earth processes and critters, demonstrating both creativity and consequences. They resist categorization and belong to no single ideology or group. The concept of kinship is also central to the Chthulucene, emphasizing the importance of forging connections beyond traditional notions of family and genealogy. Making kin as "oddkin" involves recognizing responsibility and interconnectedness among diverse beings, both human and non-human. This challenges dominant narratives about who deserves care and consideration in multispecies relationships. (pp. 2-8) In the Chthulucene, these relationships are characterized by complexity, fluidity, and mutual dependence. Tentacular practices imply a weaving together of diverse entities in collaborative and symbiotic ways. (pp. 102-103)

In *Braiding Sweetgrass*, the author invites us to look closer at the natural world and become part of it, rather than existing outside of it. They emphasize that there are opportunities to learn from plants, animals, and other species everywhere around us as they have been on earth much longer than humans, “the younger brothers of Creation,” and have had the time to understand how to coexist in balance within an ecosystem. (Kimmerer, 2013, p. 9) Authors like Whatmore and Despret advocate for a shift in scientific methodology towards a perspective of “becoming-with,” which emphasizes interconnectedness. They argue that current scientific practices often overlook complex relations between humans and non-humans and reinforce asymmetries between subjects and objects. Latimer on the other hand

proposes the concept of "being alongside," suggesting that humans and non-humans are not individuals or hybrids but rather assemblages with intermittent attachments and partial connections. The authors stress the importance of recognizing the entanglement of scientists in economic and political structures and the need for reflexivity in scientific methodologies. They argue that understanding these entanglements is crucial for addressing issues related to nature, culture, body, mind, and ecology, ultimately aiming to transcend traditional human-centric perspectives and become more attuned to the interconnectedness of all life forms. (as cited in Latimer & Miele, 2013, pp. 15-16) They argue that recognizing the interconnectedness of human and non-human elements in research can lead to more ethical and politically grounded scientific practices. Therefore, by acknowledging the affective relations between different kinds of beings and promoting engagement with these relations in scientific endeavors, it becomes possible for researchers to produce more reflexive and contextually aware knowledge. (Latimer & Miele, 2013, pp. 11-12)

Decolonizing nature therefore entails going beyond the idea of human-centered exceptionalism. It means not positioning humans at the core of the universe and no longer perceiving nature as an infinite source of resources. Demos suggests that decolonization requires challenging dominant narratives that justify colonial exploitation of nature and recognizing indigenous perspectives and practices that offer alternative ways of understanding and relating to the environment. He highlights how artists contribute to this process by addressing environmental injustices, amplifying indigenous voices, and envisioning more equitable and sustainable relationships between humans and nature (Demos, 2016, pp. 19-20). In essence, decolonizing nature involves recognizing the interconnectedness of all beings and acknowledging the wisdom and agency of non-human entities. It requires challenging entrenched hierarchies and narratives that prioritize human

dominance and exploitation. By embracing diverse perspectives and fostering reciprocal relationships with the natural world, we can move towards more equitable and sustainable futures.

2.3. Insights from the Broadleaf Plantain

As highlighted previously, in *Braiding Sweetgrass*, Kimmerer (2013) sheds light on how plants could present valuable learning experiences. They use the example of the Broadleaf Plantain, to gain insight on how to belong to a place. They first describe the plant as follows:

> Our people have a name for this round-leafed plant: White Man's Footstep. Just a low circle of leaves pressed to the ground with no stem to speak of, it arrived with the first settlers and followed them everywhere they went. It trotted along paths through woods, along wagon roads and railroads, like a faithful dog so to be near them. Linnaeus called it Plantago Major, the common plantain. Its Latin epithet Plantago refers to the sole of a foot. (p. 213)

Then draw parallels between the introduction of the plant to a new environment and human introduction to the natural world. When trying to uncover how to belong to a place, they start by discussing how being native to a place is a birthright and not something just granted, as it implies "soul-deep fusion" with the land. Therefore, "immigrants cannot by definition be indigenous." (p. 214) Looking at the Broadleaf Plantain, the plant that migrated to North America, Kimmerer highlights how the plant found a way to belong and integrate the new space, and that is through the process of naturalization. They connect the naturalization of Plantain to the naturalization of human beings in a new country. Moreover, they contrast Plantain with another plant that is categorized as invasive and harmful which is Garlic Mustard. (p. 214) Therefore, it is important to understand what the process of naturalization entails, and how plants get classified as naturalized or invasive.

In the article entitled *Naturalization of Introduced Plants: Ecological Drivers of Biogeographical Patterns*, Richardson & Pyšek (2012) offer a deeper look into what invasion and naturalization entail. They explain that biological invasions happen along a continuum that includes introduction, naturalization, and invasion stages. This continuum represents the different stages a species goes through, from being introduced to eventually becoming invasive. These stages include survival, establishment, reproduction, dispersal, and interactions with resident species. According to the author, invasive species are categorized based on different criteria. These include "the ability to sustain self-replacing populations over several life cycles; producing reproductive offspring; and having the potential to spread over long distances." Alternatively, naturalization is the stage where introduced species establish self-sustaining populations without being able to spread extensively. Naturalization is then determined by fewer factors than invasion and may be more predictable and less site-specific. (p. 384) The factors mediating naturalization and invasion are influenced by ecological features. They play an important role in determining whether a species can progress along the mentioned continuum. One of these features is the presence of a mating partner, which is relevant to some species that require a mate for reproduction. Another significant factor is obligatory mutualism, which is specific to species that depend on a mutualistic relationship with another species for their survival or reproduction. Additionally, there is the availability of specialized dispersers, as some species require seed dispersal by specific animals or wind. Furthermore, specific plant traits, such as rapid growth, efficient resource utilization, and tolerance to varying environmental conditions, can significantly impact a species' potential to become naturalized or invasive. Apart from that, habitats and disturbance play an important role in facilitating naturalization and invasion. Disturbance is crucial for the establishment of an introduced species, and some species may be pre-adapted

to certain habitats in their native habitat, influencing their ability to establish in new regions. Propagule pressure, which refers to the quantity and characteristics of individuals or reproductive units of a species that are introduced into a new area during a biological invasion, residence time, and nurturing, also guides naturalization and invasion. Assistance provided by humans helps plants and animals adapt to new places and can protect small populations from unpredictable changes in the environment. This helps increase the number of reproducing individuals. Moreover, whether the plant has been introduced on purpose, such as for horticulture, or unintentionally influences the success of the species. Lastly, environmental and climate matching is essential for the progression along the continuum in a new environment. (pp. 388-391)

In the context of the Broadleaf Plantain, Hawthorn presents an overview of biological information of Plantago Major (Broadleaf plantain) in the article *The Biology of Canadian Weeds. 4. Plantago Major and P. Rugelii.* It is a perennial plant originally native to Eurasia. It came to North America, notably Canada, with European settlers and has since naturalized across the continent. It is commonly found in disturbed areas, lawns, gardens, and along roadsides. The plant is distinguished by its rosette of broad leaves that produces tall spikes of small flowers. Those flowers are wind-pollinated and self-compatible. Its seeds are dispersed by adhering to soil particles, feathers, fur, and water. Furthermore, it is hemicryptophyte, which means that it has overwintering buds, or renewal buds, that are situated just below the soil surface. This strategy along with its extensive root system allows it to survive harsh environmental conditions, such as cold winters or dry seasons, and then emerge and grow when conditions become more favorable. Making Plantago Major a highly resilient plant. (Hawthorn, 1974)

The introduction of new species such as Broadleaf Plantain to new environments can have significant and often complex impacts on existing ecosystems. This phenomenon provides an interesting opportunity to examine ecological changes. In the book Emergent Ecologies, Kirksey (2015) explores "multispecies communities that have been formed and transformed by chance encounters, historical accidents, and parasitic invasions." They suggest that after major disruptions such as deforestation or volcanic eruptions, new community assemblages and ecosystems can develop. These new associations have the potential to replace existing structures and offer hope for the restoration of damaged environments. Such as in the case of Broadleaf Plantain which strives the most in the most neglected areas in the city. Similarly, when looking at the introduction of new species to an environment whether invasive or naturalized allows new interactions within altered ecosystems. Additionally, the author suggests focusing on hope rather than despair when dealing with environmental challenges and changes. They shed light on the fact that emergent phenomena are not always destructive; they can also be a source of hope. When ecosystems are disrupted, emergent plants and life forms can quickly reestablish themselves, offering the promise of renewal and regeneration. (pp. 1-7)

Kirksey's optimistic perspective made me think of Tsing's writing on life amidst precarity and ruin. In the prologue of *The Mushroom At The End Of The World,* they ask "What kinds of human disturbances can we live with? Despite talk of sustainability, how much chance do we have for passing a habitable environment to our multispecies descendants?" They use the example of Matsutake mushrooms to illustrate broader themes of precarity and resilience. Matsutake mushrooms, which thrive in disturbed environments, serve as both pests and valuable commodities. Their ability to grow in challenging conditions suggests possibilities for coexistence within environmental disruption. Tsing argues for a

recognition of the patchiness and unpredictability of contemporary conditions. She suggests that traditional narratives of progress and development obscure the diverse ways in which people and ecosystems adapt and thrive in response to disruption. As a matter of fact, they emphasize that it's important to stay curious and open-minded while navigating today's complex and uncertain world. By rejecting simplistic narratives of progress and embracing the unexpected, we can better understand and engage with the patchwork of life and livelihoods that characterize contemporary precarity. (Tsing, 2015) This hope that both Kirskey and Tsing address is not naive optimism but rather a recognition of the adaptive capacities of both human and non-human actors in navigating uncertain landscapes.

The example of the Broadleaf Plantain thriving in disturbed and often neglected urban areas underscores the resilience of the species in the face of environmental disturbance. While studying this plant and its integration into new environments, I am continuously discovering valuable insights that guide my research journey. One aspect that fascinates me is the plant's cultural significance and its historical interactions with human societies. Examining how perceptions of the plant vary across different cultures provides valuable insights into how cultural factors shape our understanding of nature and the environment. Additionally, the Broadleaf Plantain serves as a living example of adaptation and resilience in the face of environmental disruption. Its ability to thrive in neglected urban areas underscores the dynamic nature of ecosystems and the potential for coexistence between introduced species and native biodiversity. By studying the plant's ecological interactions and adaptation strategies, I am gaining a better understanding of ecosystem dynamics and resilience. My own research journey with the Broadleaf Plantain is shaping my perspective on ecological issues.

2.4. Humans, Plants, and Technology in Ecological Discourse

Numerous scholars explored the interconnectedness of humans, plants, and technology within ecological discourse, each offering a unique perspective on the subject. In Haraway's (1991) *A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century* they introduce the concept of the cyborg as a fusion of animal or human and machine, transcending the boundaries between organisms and machines to augment the abilities of organisms. They describe them as challenging conventional notions of reality and identity. By approaching the cyborg as a creature of social reality, they aim to blur the boundaries between fiction and reality, highlighting how science fiction and speculative narratives influence our lived experiences. The cyborg concept challenges traditional Western myths and power structures, advocating for survival, empowerment, and regeneration in a world where boundaries between humans and machines are blurred. Additionally, Haraway states that "Technologies and scientific discourses can be partially understood as formalizations, i.e., as frozen moments, of the fluid social interactions constituting them, but they should also be viewed as instruments for enforcing meanings." (p. 165)

Michael's (2002) work, *Reconnecting Culture, Technology, and Nature: From Society to Heterogeneity*, emphasizes the complexity and fluidity of the connections between culture, technology, and nature. They emphasize that these elements are not isolated entities but are interconnected within a complex web of relationships. Their work advocates for the study of mundane technologies, that are no longer viewed as "exotic" and "innovative", and that have fully integrated our lives, in order to understand "the conceptions of the social and of nature." According to them, technology plays an important role in mediating the relationship between culture and nature. Additionally, they discuss it through the lens of hybridity, by delving into

how diverse elements including humans, technologies, and “natural” non-humans, converge to form “co(a)gents” that significantly shape human experiences and perceptions. (pp. 3-4) In this case, the concept of co(a)gency serves as a tool to reveal the multifaceted connections within everyday life, allowing for the examination of connections that may go unnoticed, and offering a means to narrate these connections in new and insightful ways.

Similarly, Gould's (2021) work, *Kitting the Digital Humanities for the Anthropocene,* offers an interesting perspective on the relationship between human bodies, cultural technologies, and the environment, introducing the concept of “Digital Metabolism.” This concept would serve as a model for understanding our relationship with technology and the planet. (pp.95-96) As our digital world keeps growing and becoming more connected, we need to develop a way of thinking and working that considers the impact on the environment. They underscore the need to create a set of tools for understanding and acting in this digital age to adapt to the environmental changes caused by human activities and technology. (p. 94) This text suggests that in the Anthropocene age, human bodies, cultural technologies, and the environment are interconnected. However, this interconnectedness isn't a futuristic or post-human concept. Instead, it's a natural metabolic relationship where each element contributes to the existence of the others. In this case “Digital Metabolism” isn’t just a metaphor, but an operational definition of how digital technology functions and how it's connected to human and environmental ecosystems. (pp. 95-96)

These works can also be situated in relation to Indigenous cultures and their perspectives on the interactions between culture, technology, and nature. In *Making Kin with the Machines,* Lewis et al. (2018), explore technology, specifically Artificial Intelligence in the context of Indigenous cultures and their ontologies. They suggest the idea of “making kin” with machines, where technology is perceived as a relative instead of a tool to be

controlled or dominated. They argue that Indigenous communities can form meaningful relationships with machines and other forms of technology by drawing on traditional ways of understanding kinship and relationships with non-human entities. Additionally, they emphasize the significance of decolonizing technology and ensuring that it is accessible and responsive to the requirements and principles of diverse communities.

As Gould (2021) states towards the end of her text, the main idea is not to get rid of technology because humans are both natural and reliant on technology. Instead, we should become more aware of how we use technology and use it to solve the problems it creates. We can lead by example within our fields and use our knowledge to bring about lasting changes in how we practice and understand relationships. (pp. 107-108)

Each scholar's perspective sheds light on how technology influences and shapes human-nature relationships. Haraway's (1991) concept of the cyborg challenges traditional boundaries between humans and machines, highlighting how technology augments the abilities of organisms. However, this augmentation also amplifies the impacts of human actions on the environment. The blurring of boundaries between fiction and reality emphasizes the need to critically examine how technology shapes our perceptions and interactions with the natural world. Similarly, Michael (2002) emphasizes the role of technology in mediating the relationship between culture and nature. Mundane technologies, fully integrated into our lives, amplify human influence on the environment and shape our conceptions of society and nature. The concept of co(a)gency reveals the multifaceted connections within everyday life, illustrating how technology amplifies human impacts on the environment through its integration into cultural practices. Gould's (2021) discussion on "Digital Metabolism" underscores the interconnectedness of human bodies, cultural technologies, and the environment in the Anthropocene age. While digital technology offers

opportunities for connectivity and problem-solving, it also amplifies the environmental consequences of human activities. Recognizing technology's role as both a solution and a contributor to environmental challenges is crucial for developing sustainable practices. Lewis et al.'s (2018) exploration of Indigenous perspectives on technology highlights the importance of decolonizing technology and fostering meaningful relationships between humans and machines. Viewing technology as a relative rather than a tool amplifies the ethical considerations surrounding its development and use, emphasizing the need for technology to align with the principles and requirements of diverse communities.

2.5. Ecocritical Installations as Agents of Change

Ecocritical installations are art forms that critically engage with ecological and environmental issues. They challenge viewers to think critically about their relationship with nature and the impact of human activities on the environment. They may pose questions, offer alternative perspectives, and provoke thought and reflection. As mentioned previously, in the book Decolonizing Nature: Contemporary Art and the Politics of Ecology, Demos (2016) contends that art, with its history of experimentation and radical thinking, has the potential to trigger creative shifts in our perception and philosophy, offering new ways of understanding ourselves and our relationship with the world that contrast with the destructive legacies of colonizing nature. Moreover, they argue that we should move beyond merely analyzing corporate practices and international trade policies that prioritize the economy over the environment. Instead, we need to decolonize our concept of nature in a political sense by challenging the dominance of financial interests, questioning the legal concept of corporate personhood, and redefining our laws to recognize and enforce nature's rights to exist. (pp. 18-19) This sheds light on the use of ecocritical installations as a medium to be explicitly political and advocate for changes in policy or practices that impact the environment.

Figure 02 — Econario (2022) by Thijs Biersteker in collaboration with the Natural History Museum London. Photo by the artist.

In an installation entitled *Econario* (2022), Thijs Biersteker creates a robotic plant that visualizes the impact of political choices on biodiversity. The plant is connected to a database containing information about political decisions and their environmental impact. When a negative decision is made, such as cutting down a forest, the plant's leaves will sag and turn brown. Alternatively, when a positive decision is made, such as a new conservation law, the plant's leaves will stand upright and become greener. The purpose of Econario is to create a tangible representation of the impact that individual and collective actions have on the environment and to encourage viewers to consider the long-term consequences of their choices. By connecting digital technology with environmental awareness, the project highlights the importance of ecocritical perspectives in shaping our relationship with nature. Additionally, the installation was built from recycled steel, perhaps taking into consideration its ecological footprint. Most importantly, it was exhibited during the United Nations Biodiversity Conference (COP15) in Montreal, Quebec, Canada in 2022 targeting directly

policymakers at the conference. Ecocritical installations have the potential to convey complex ecological and environmental issues by presenting these topics in a visually compelling and emotionally evocative manner. They capture the attention of viewers who may not have previously been engaged with these issues. According to Gould (2021), ecocritical digital works have the advantage of being public, global, and accessible. They present themselves by translating human-environmental issues into digital interventions that can "meaningfully disturb the system" whether through digital activism, digital archives, digital data, or digitally-based research projects, etc. (p. 96)

Figure 03 — Seeds of Change (1999-present) by Maria Thereza Alves.

In *Seeds of Change* (1999-present), Maria Thereza Alves researched and collected seeds from plants that had been unintentionally brought through ship ballasts from the Americas to Europe during colonization. The primary objective of this project is to highlight

the historical and cultural impact of the European colonization of the Americas and the intentional and unintentional global exchange of plants, seeds, and knowledge during that time. The artist posed two major questions "At what moment do seeds become 'native'? What are the socio-political histories of place that determine the framework of belonging?" They traced the journeys that these seeds took and examined their connections to various regions and communities. Moreover, they collaborated with local communities to reintroduce the historical seeds that they collected and put them back in their places of origin. The documentation of the project plays an important role in showcasing the artist's journey through research and exhibition. The project uses storytelling to reflect on the memories that are associated with the seeds and engage the public in ecological discourses—making it a great example of how art has the potential to reclaim narratives and social realities that might've been erased over time. These seeds have the potential to change the way we perceive the identity of certain places within a specific bioregion despite going unnoticed. A major aspect of the work is site-specific illustrating the significance of working in the original location of the subject. It's an example that showcases the effects of working within a specific environment, which can be an interesting approach when it comes to my work with the Broad-Leaf Plantain, a plant abundantly present in the urban space that often goes unnoticed.

Figure 04 — Forest Mind installation at the 15th Cuenca Biennial of the Biocene, Ecuador. Artist: Ursula Biemann

Forest Mind (2021) is another example that addresses the cultural dimension of ecocritical practices. In this case, Ursula Biemann explores the relationship between humans and plants in the Amazon rainforest of Colombia. The forest itself is an interesting starting point since it combines a rich history of colonial conquests and natural science. The project engages in different aspects of the territory through video-making, photography, academic research, personal narrative, and the co-creation of an Indigenous University with the Inga people of Colombia. It draws on both scientific and shamanic perspectives to examine the metaphysics of plants, plant-human relationships, and the coding of life (DNA). It focuses on the intelligence found in nature. Through their work, they challenge the idea that modern science and indigenous knowledge are incompatible. They aim to bring indigenous knowledge into a common reading with modern science. Furthermore, they explore the relationship between DNA and consciousness through visual and scientific methodologies by which the digital code of sonic files can be converted into DNA codes that can be stored for a long time. In this

case, the installation works with the visual language produced by technology as well as the DNA sequences generated by the sonic, visual, and biological components of the rainforest. This creates an interesting relationship between storage media and humanity's own code, between mind and forest. This work resonates with Demos's (2016) translation of the Quechua term "sumak kawsay," which means "living in plenitude, knowing how to live in harmony with the cycles of Mother Earth, of the cosmos, of life and of history, and in balance with every form of existence in a state of permanent respect." (pp. 24-25) Ecocritical installations challenge conventional notions of nature and humanity's place within it. They encourage viewers to reconsider their assumptions and worldviews, potentially leading to a shift in values and priorities.

Figure 05 — Screenshot of the Feral Atlas website.

In *Feral Atlas* (2021) Tsing et. al. created an online repository involving maps and narratives that explore the global proliferation of invasive species and entangled relationships between human and non-human actors in the Anthropocene. This digital work engages with ecocritical themes, specifically the modern perception of nature. It promotes a more inclusive

understanding of nature by examining the presence and implications of invasive species within various ecosystems. As a digital work, the *Feral Atlas* demonstrates the adaptability and versatility of technology in representing and exhibiting complex information. By leveraging interactive features, the project enables users to actively engage with the content, encouraging a deeper understanding and appreciation of the issues related to the Anthropocene. Furthermore, as a non-site-specific artifact, it is accessible to a global audience, transcending physical limitations and geographical boundaries, thus promoting wider awareness and knowledge dissemination by embracing its "feral" nature.

Figure 06 — Children getting to know the Nomadic Plant in Río Lerma, Salamanca. Artist: Gilberto Esparza

Finally, in the project, *Nomadic Plants* (2014), Gilberto Esparza identifies nonhuman agencies that coexist with us. They explore new forms of ecosystem and symbiosis through their work. They combine three main components: a robotic system, an organic plant species,

and a set of microbial and photovoltaic fuel cells. This combination forms an autonomous species with a unique metabolic cycle that has the potential to help repair ecological damage in its surroundings on a small scale. The hybrid entity's primary purpose is to survive and thrive in environments that have been negatively affected by water contamination. The plant encounters contaminated water, it absorbs and stores it. Then, it uses a group of microbial cells that contain bacteria and autochthonous microorganisms to start the process of biodegrading the organic waste and breaking down toxic substances present in the contaminated water. This metabolic process generates electricity to power the apparatus. Behind its unconventional and amusing concept, the project provides a strong basis for a critical exploration of the role that technology plays in cities and new forms of collaborations between organic and technological objects.

3.0. Research Methods and Methodology

In employing research-creation methodology, I integrated various methods to conduct my investigation. Based on Chapman & Sawchuk (2012) *Research-Creation: Intervention, Analysis and "Family Resemblances",* Research-creation emerges as a significant category within the realms of social sciences and humanities, particularly in Canada, comparable to "practice as research" in Britain and Australia, and "arts-based research" in the United States. This approach represents an epistemological intervention within academia, integrating theoretical, technical, and creative elements concurrently. Projects within research-creation embody a fusion of creative processes, experimental aesthetics, or artistic works with scholarly inquiry, delineated into four distinct modes: research-for-creation, research-from-creation, creative presentations of research, and creation-as-research. These categories represent diverse sets of criteria, practices, and outcomes highlighting the methodological and critical potential of research-creation in contemporary academic discourse. (pp. 5-7)

These categories are not mutually exclusive; they illustrate the multifaceted nature of research-creation. Given the nature of my research, I combine these modes starting with research-for-creation. As indicated in a previous chapter, I conducted a comprehensive literature review gathering materials, and ideas to inform my creative process. Despite occurring before production, those initial research instances informed ethical and aesthetic choices throughout the creative process. I employ fieldwork, observations, and reflexivity, which will be discussed in this chapter, along with prototyping, a significant aspect of my research to be addressed in the following chapter. These methods, grounded in the research-from-creation mode, enable me to gather valuable data and insights that informed and shaped my creative endeavors. Additionally, I utilize visual documentation as another method, falling under the mode of creative presentations of research. Through visual documentation, such as

photographs, videos, and sketching, I capture and record visual information related to my research, providing visual evidence and documentation of my observations, findings, and creative processes.

When I chose my research methods, Simpson's (2017) chapter *Land as Pedagogy* deeply influenced me, as it highlights the profound wisdom embedded in Indigenous knowledge systems. Despite being non-Indigenous and new to Canada, I approach this with profound respect for the diverse ways of knowing that exist. Simpson's advocacy for a return to land-based pedagogies resonates deeply with me, and the nature of this research, emphasizing the land itself as the teacher and fostering a profound connection to Nishnaabeg intelligence and culture. The Nishnaabeg have historically gleaned guidance on how to live through their interactions and observations with the environment, showcasing the fundamental importance of these teachings. (pp. 158-159) Furthermore, the concept of consent within Nishnaabeg education starkly contrasts with the coercive nature of colonial educational systems, underscoring the importance of relationality and learning from the environment. (pp. 160-162) Nanabush's experiences, as mentioned by Simpson, exemplify the importance of relational learning, spiritual guidance, and practical experimentation in the process of coming to know. (p. 166) It is stated that efforts to integrate Indigenous knowledge into academia often fall short, reinforcing colonial authority and failing to recognize the validity and context of Indigenous intelligence. (p. 170) Therefore, I approach this integration with humility, recognizing my position as a learner on this journey of understanding and respecting diverse knowledge systems.

3.1. Fieldwork

3.1.1. Land Stewardship Activities

As part of my fieldwork, I felt the need to connect with the land I was studying. It was beyond data and science; it was about immersing myself in nature to better understand the connections between the environment, and the people. This endeavor was also about confronting and challenging my own perceptions and biases. I decided to shift away from my usual research routines and assume the role of a land caretaker, to foster a reciprocal relationship with the land I'm working on. Taking care of the earth wasn't just a responsibility; it was a gesture of gratitude, a way of repaying the land for its teachings, and what it had to offer from insights in my research. Among the activities I participated in was invasive species management in the High Park, Toronto area. Every other Thursday between September 2023 and December 2023, I helped control the spread of certain plant species considered harmful and invasive by pulling them out from the ground they established themselves in. Those species included European Buckthorn, Oriental Bittersweet, and Dog Strangling Vines. On one hand, I was actively removing entities considered invasive and harmful, yet on the other, I kept thinking about how humans played a significant role in the proliferation of these species in the first place. This internal conflict raised questions about the intricate and often conflicting relationship between humans and the land.

Yet, stewardship extended beyond controlling invasives, it also involved fostering the growth and nurturing of native species. I started planting species that were considered native, and that have been impacted by human activities. These included Hoary Vervain, Sky Blue Aster, Butterfly Milkweed, Black-Eyed Susan, Big Bluestem Grass, and Canada Wild Rye. Placing each species in the soil felt like I was nurturing and restoring the land. In these moments I felt like the boundaries between the researcher (myself) and the researched

blurred. I was no longer just a distant observer who was getting information from books and other resources, instead, I became part of the ecosystem. The sweat and the dirt under my fingernails weren't just the consequences of labor, they became tangible connections to the land. Every aspect of these practices became part of the wild, interconnected narrative.

Planting Big Bluestem Grass

Carrying the "Extractigator"

Examining the "Extractigator"

Filling hole with water before planting

Removing European Buckthorn with my hands

Loosening up the soil around the European Buckthorn

Figure 07 — Summary of the Land Stewardship Activities

3.1.2. Encounters with the Broadleaf Plantain in Different Urban Contexts

Another aspect of my fieldwork involved focusing on the plant I am studying, the Broadleaf Plantain. It's a plant I encountered everywhere in the city in various urban contexts. It seemed to thrive in the most disturbed places around the neighborhood and the streets I walked through. It pushed through parking lots, sidewalk cracks, and parks where it sometimes found refuge under trees and even made its presence known around my university building. It is fascinating how this plant adapted to these different environments. Regardless of how abundantly present it was around the city, Broadleaf Plantain isn't a commodity sold in nurseries or stores.

To study the plant more closely, I needed to collect specimens. This part was particularly challenging, as foraging for plants in urban areas comes with its own set of ethical considerations. I reached out to classmates and some faculty members and sought their permission to dig out the plant from their backyards or private properties. Alternatively, I found myself scanning the streets, strategically selecting locations where I would be able to dig out the plant or harvest some seeds without experiencing issues. Foraging in parks, though tempting given that the soil was easier to dig in, was often frowned upon and sometimes strictly prohibited. The process then involved some delicate negotiations. Each location required a thoughtful approach, balancing my research needs while respecting private spaces and adhering to urban regulations. I was most comfortable picking plants from private properties after prior authorization from those responsible for the land, or from small cracks and crevices in sidewalks where the plant had managed to establish itself.

While engaging in this hands-on activity, I experienced a peculiar sense of safety and risk. On one hand, I knew that if I was questioned, I could clearly explain that I was removing what most people considered a weed – a service, in some cases. On the other hand,

it made me contemplate the perceptions attached to different plants. I realized then that my actions might have received different responses if I had collected a native or more conventionally appreciated plant. Navigating these thoughts provided a compelling lens through which I was able to reflect on my actions and their implications. It prompted me to think about the intricate dynamics between human perceptions, urban spaces, and the plants that persist within them. The process of collecting the Broadleaf Plantain became not just a scientific journey but a nuanced exploration of society's attitude towards plants and the hidden stories within urban landscapes.

Figure 08 — Broadleaf Plantains that were grown from seeds inside Dr. Ian Clarke's Passive Urban Greenhouse at OCAD University.

Collecting mature plants from the streets wasn't my only means of accessing the plant. Over the fall season, I gathered seeds from the plants and planted them in pots at home, hoping to monitor and nurture them for insights and eventual integration into my prototypes and exhibition. Initially, the experiment seemed straightforward, but I soon encountered numerous obstacles, from insect infestations to plant deaths. This made me reconsider my approach; there was something inherently exploitative about growing the plant for specific purposes. At some point during the year, I even had the opportunity to grow the plants in a

greenhouse. It provided the ideal environment for the plants, which led me to reflect on the irony of utilizing such sophisticated technology to care for what is typically considered a weed.

3.2. Observation

In contrast with all that I have gathered from scientific knowledge in the literature related to the Broadleaf Plantain, I needed to conduct my own observations to reflect on my relationship with the plant. Working with plants demanded a heightened level of understanding, attention, and humility. I'm here to learn about them and from them, therefore it was important for me to recognize my position in relation to the group of independent living beings that made up the plant's ecosystem. This perspective guided my interactions, emphasizing that plants possess their own distinct ways of sensing and presenting themselves in the world. Observation became a crucial communicative tool for me. I aimed not only to study the plant's behavior and adaptability but also to engage in a reciprocal exchange, learning from the plant's inherent wisdom as it expressed itself in its environment. These observations were carried out in different urban contexts switching between my home space and out in the city. Despret emphasizes the importance of "affected perspectives," where scientists or researchers openly engage with the animals they study, allowing their bodies to be affected and changed by their research practices. This approach challenges the traditional view of scientists as detached observers and instead encourages a more intimate and participatory relationship with the subjects of study. This method not only enriches the scientific understanding of animal behavior but also challenges the conventional boundaries between human and non-human worlds. By acknowledging the affective dimensions of scientific practice, it is possible for a more holistic and ethical approach to scientific inquiry. (as cited in Latimer & Miele, 2013, pp. 12-14)

3.2.1. Observations at Home

In the confined and controlled space of my home, I examined the plants that I picked out from outside. The act of displacing them carried both challenges and responsibilities. When the weather was warm during the summer and fall seasons, I placed the plants on the balcony of my apartment. However, when winter arrived, I moved them indoors, and with the use of technology provided them with the adequate living conditions they required to survive the winter. Having the plants in such proximity allowed me to notice the most subtle changes in their behavior and appearance. In the past 8 months, they have become an integral part of my daily life, they occupied a significant space in my home.

The shift from the balcony to the inside influenced my care routine. On the balcony, the plants had easy access to natural elements like sun, wind, and soil, with watering being my main concern. Once inside, every aspect needed careful attention – from soil moisture and sunlight to room aeration and humidity levels. Despite having technological tools like soil moisture sensors and LED grow lights, I found myself more invested, and attentive to ensuring the plants' survival. This change in attention was somewhat ironic. While the plant required minimal care outside, it demanded much more once brought indoors. This experience pushed me to reflect on my actions and intentions. I grappled with ethical considerations about displacing the plant and subjecting it to challenging conditions in the name of research. An aspect that I will discuss more in my prototyping journey.

3.2.2. Observations in the Outdoor Urban Space

Observations were also carried out outside in the streets, and the parks. In this case, they took on a different dimension. Here, I familiarized myself with the plant's ecological role and interactions with the environment. I watched birds and insects feed on it revealing its place in the local ecosystem as a food source. I saw dogs sniffing it, and people walking over

it. It was interesting to me to watch to what extent beings interacted with it without necessarily knowing anything about it or how it made itself present so abundantly in the spaces we constantly frequent. I noticed the plant's ability to thrive in the most rigid and compacted soils, breaking them down in the process, unfolding as a testament to its resilience and ecological significance. Whether alone in the concrete jungle or coexisting within a group, I observed how the plant presented itself, adapting to shade or basking in sunlight. Alleyways, often neglected, became its home, and I marveled at its existence in these overlooked spaces. The plant's presence was not limited to forgotten corners; it gracefully lined the edges of parks, sharing space with other species and offering a green greeting to those who visited.

Whether within the confines of home or amidst the bustling urban environment, observation served as a lens through which the silent narratives of the plant unfolded, enriching my understanding of its intelligence, adaptability, and ecological roles.

3.3. Visual Documentation

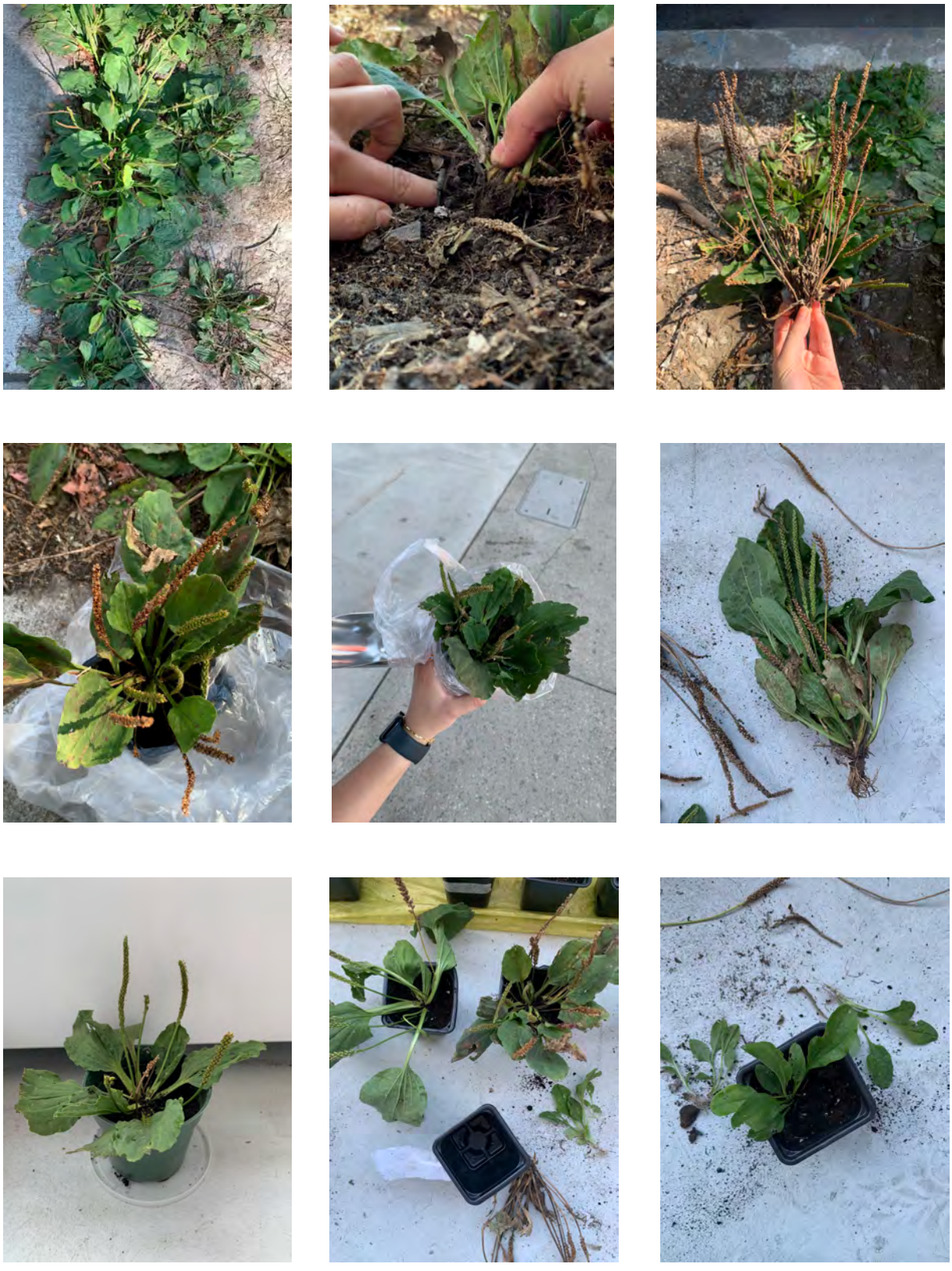

Figure 09 — Summary of the Broadleaf Plantain foraging in the city.

Visual documentation was another prominent method that I adopted throughout my research. It allowed me to provide a tangible and often nuanced record of certain facets of my research that my words alone struggled to illustrate. By visually recording certain aspects of my research, I provide people with additional layers of understanding and context to complement my written descriptions. Since my work involved fieldwork, it was important for me to document the locations I was exploring. This method served not only as a personal record but also as a bridge. The places I referenced in my work were dynamic and rich in contextual significance, which made it important for me to connect the audience with them. Through visual documentation, my objective was to create a tangible and immersive experience for others. The images and videos that I captured throughout my research became a tool for storytelling, allowing me to communicate research findings in a compelling and accessible manner. They add visual dimensions to the narratives I construct. The visual storytelling aspect of my research was not just about presenting data; it was about evoking emotions, sparking curiosity, and creating a more profound impact. I incorporated some of the visual captures in some of the installations that I worked on, such as photographs, videos, drawings, and objects. These installations serve as a way to foster a multi-sensory experience and connect the audience with the narratives.

3.4. Reflexivity

In my research journey, self-reflexivity served as a fundamental method through which I navigated the complexities of my role as a researcher and engaged in a continual process of personal and intellectual growth. I have adopted a reflective journal as inspired by Gray & Malin's (2004) writings on “The Reflective Journal” in Visualizing Research. This method served as a purposeful process and framework for facilitating better conversations with myself. As a 25-year-old woman who arrived in Canada approximately two years ago,

my academic journey at OCAD University introduced me to the concept of decolonization. While I come from a country in the Global South that has its own colonial history, my understanding of decolonization was limited before my studies here. Through readings, discussions, and various activities, I embarked on a journey to deepen my understanding of decolonization and its implications.

Going into my research journey, which involves a reciprocal exchange of knowledge with the plant I am studying, I recognized the importance of self-reflection in acknowledging my own thoughts, progress, and biases. Rather than approaching my research as a detached observer, I learned to work collaboratively with the plant, positioning myself as a co-learner rather than a mere researcher studying an object. Throughout my writings, I aim to emphasize ethical considerations, whether they pertain to my approach to the research, my interactions with the plant and environment, or my engagement with different knowledge systems.

Drawing from Gray & Malin's insights, my reflective journal served as a dynamic repository for various types of information, including activity logs, diaries, documentation of work in progress, contextual references, and information about the pace and progress of work. It accommodates reflection "in," "on," and "for" action, capturing the dynamic nature of my research process. The journal contains records of experiments, accompanied by visuals such as photographs, and drawings. Descriptive diary entries provide insights into my experiences and emotions throughout the research journey.

Despite not identifying myself as a colonizer or a native of this land, I found myself drawn to the concept of naturalization embodied by the broadleaf plantain. Like this species, I aspire to be present in my research without causing harm, embodying a sense of belonging while respecting the complexities of the ecosystem I inhabit. On October 16, 2023, I wrote:

> In contemplating my presence within the intricate ecosystem of my research, I am constantly reminded of the delicate relationship between observer and observed, between identity and environment that unfolds within the world of my research. Amidst the bustling rhythms of nature, I find myself like a silent witness both grounded and confused in my inquiry. I was in unfamiliar territory. In this exploration, I am very much aware of the interconnectedness of all things. Throughout my research journey, I am humbled by the diversity, complexity, and infinite possibility. I think of myself as neither the colonizer nor the native, however, I am constantly drawn to the concept of naturalization as I came to know it through the Broadleaf Plantain, Much like this resilient species, I strive to embody a presence in my research that is both harmonious and obstructive by finding a balance between immersion and restraint. In embracing the concept of naturalization, I am reminded that we are but fleeting participants in life. And so, I endeavor to be present in my research with a spirit of humility and gratitude, ever mindful of the delicate balance that sustains us all.

Embedded within the narrative of my research, self-reflexivity becomes a deliberate act of self-discovery and growth. Drawing inspiration from Kimpson's (2005) Chapter 3 "Stepping off the Road" in which they explore self-reflexivity in research writing, I acknowledge that my identity and lived experiences inevitably shape my research practice. By actively incorporating my positionality and subjectivity into my work, I aim to contribute to a more transparent and accountable research practice. (p. 74) Through this critical examination of my position as a researcher, I strive to navigate the ethical tensions and power dynamics inherent in my research context, ultimately contributing to a more nuanced understanding of my research subject and the broader narratives it encompasses.

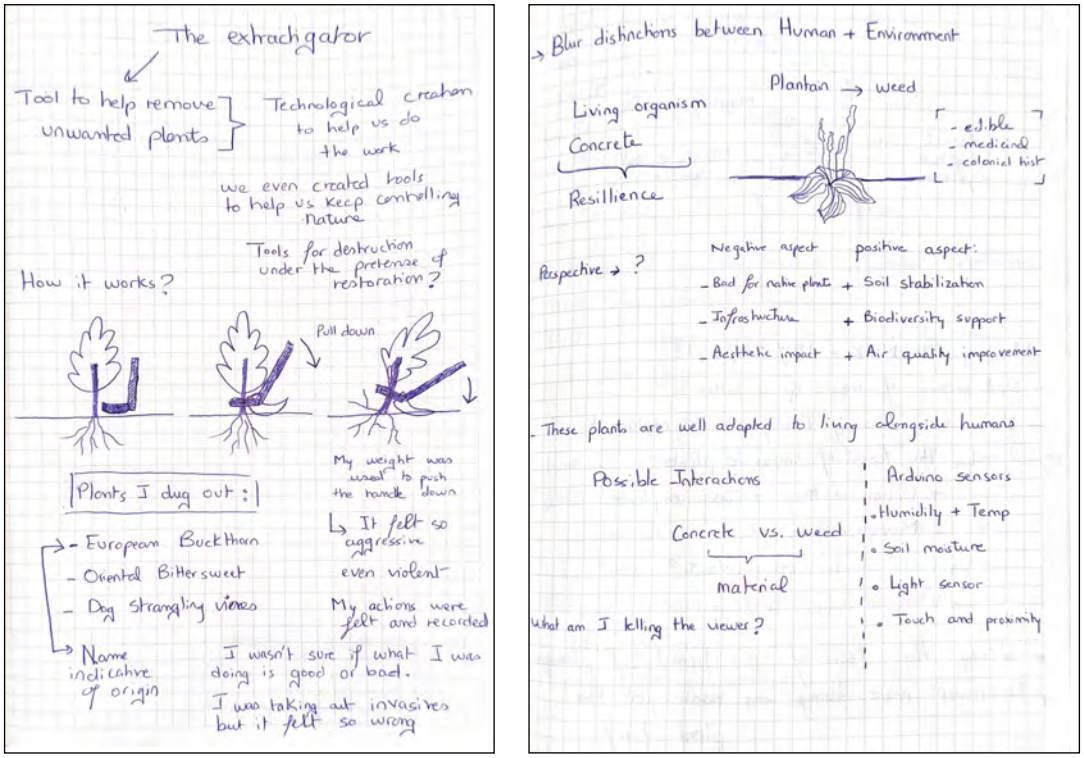

Figure 10 — Moments of reflection in the sketchbook, in discussing my experiences and interactions during fieldwork and observation with the broadleaf plantain, I reflect on my biases, and the complexity of my relationship with both the plant and the spaces I study.

4.0. Prototyping & Reflections

My prototyping journey consisted of digital explorations uncovering Broadleaf Plantain's history through technology. As I mentioned earlier, part of my research involved taking care of Broadleaf Plantains that I either picked up from the streets and backyard patches or nurtured from seeds. Cultivating these plants outside of their natural habitat was an interesting endeavor considering my lack of experience in plant care. I wasn't sure if the experience felt particularly challenging because of the time limitations of my research project or if growing plants was hard.

I used technological tools to help me understand the plants' needs, such as soil moisture sensors and LED grow lights. Interestingly, the introduction of these tools into my care routine made me behave differently. This observation resonates with Haraway's (1991) text *A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century,* where they discuss how technology enables networked relationships among individuals, transforming the way we communicate, collaborate, and relate to one another. In my case, these tools help me gain a deeper understanding of the plants' requirements to flourish in their new environment.

Comparing my attentiveness and concern before and after integrating these tools, there was a noticeable shift. When I started measuring the soil moisture levels and meticulously monitoring the light exposure from the grow lights, I noticed how it evoked a heightened sense of responsibility towards the plants. Strangely, quantifying these variables seemed to intensify my dedication when compared to the causal care they received when they were left to nature's whims on the balcony.

Haraway (1991) wrote about how technology often amplifies existing power dynamics. In the context of my research, the introduction of technological tools not only

enhanced my ability to care for the plants but also reinforced my authority and control over their environment. This realization prompted me to reflect on my own relationship with the plants and acknowledge the power dynamics at play. In positioning the plants at the center of my research endeavor and exerting authority over their environment, I recognize the ways in which technology mediated and shaped my interactions with them.

4.1. Plant Incubator

My frustration with keeping the plants alive inspired the first version of this prototype. I designed a technological apparatus meant to nurture the Broadleaf Plantain in an indoor gallery space. I created it as a means to start exploring and communicating the complex relationship between humans, nature, colonization, and urban environments. I first started designing a system involving humans, machines, and plants similar to what I was doing with the plants at home.

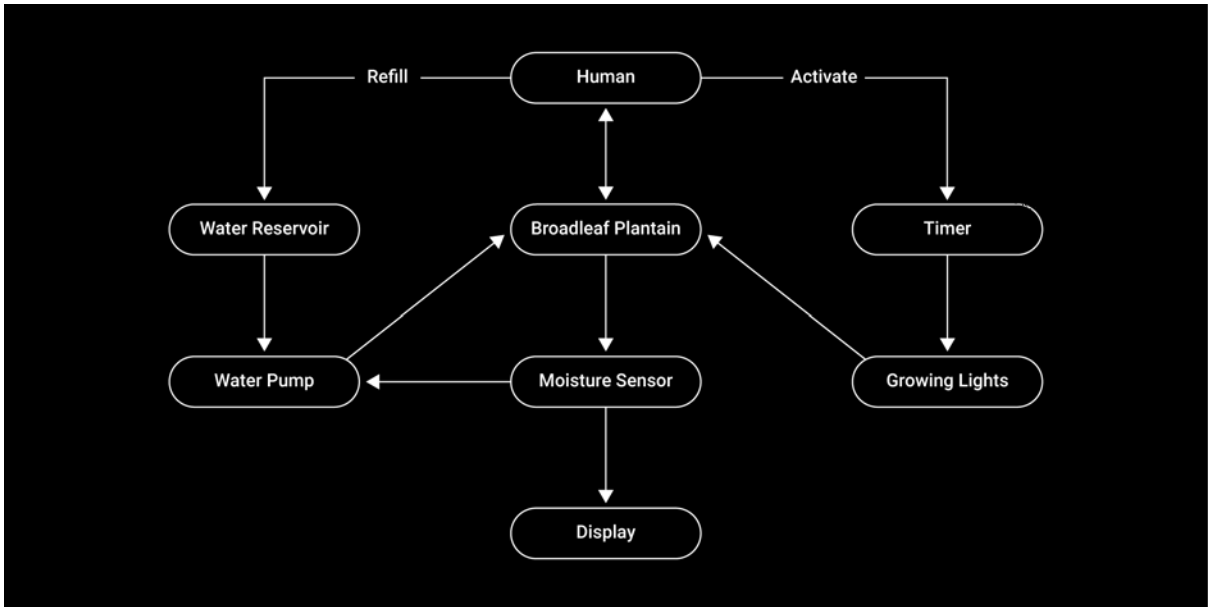

Figure 11 — The apparatus included the Broadleaf Plantain connected to a soil moisture level sensor. When the sensor detected dry soil conditions, it activated a water pump, with moisture values visually displayed on a small screen using Arduino. This technological creation necessitated human intervention to periodically fill the water reservoir. Additionally, the system was integrated with grow lights, which needed to be initially activated by a human and subsequently regulated by a timer. As indicated in the figure below.

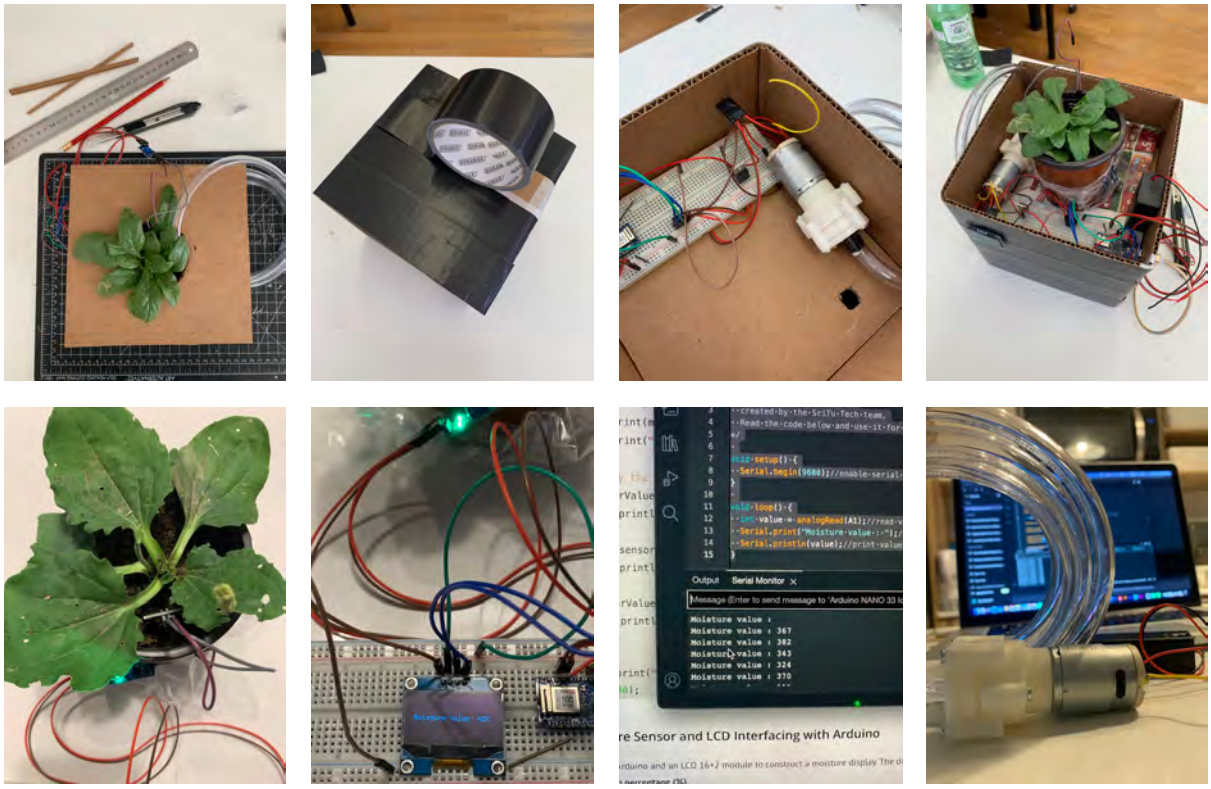

Figure 12 — Construction of the Prototype

At this stage, the system could have included any other plant or no plant at all. However, following my research about the historical significance of Broadleaf Plantain as an introduced species, and its relationship to colonization. I pondered on the significance of integrating Broadleaf Plantain specifically in this prototype. It's a plant that arrived in Canada during the migration of the European settlers to North America.

According to Hawthorn (1974), the plant was first recorded in New England in 1672, in Montreal in 1821, and observed on the west coast in 1899. They explained that its introduction and rapid spread likely resulted from its presence as a contaminant in crop seeds. Additionally, they noted that the seeds have the capacity to attach to soil particles, facilitating transportation through various means. (p. 387) In an article entitled *Broadleaf Plantain,* Chandran (2020) writes that broadleaf plantain is believed to have been brought to the New World by the Puritans via New England. Initially, it was grown for its positive medicinal attributes. Settlers and explorers utilized extracts from its leaves to remedy various ailments. Historically, it was cultivated in monasteries for its diverse medicinal benefits. This highlights the fact that it might not have been introduced completely unintentionally to North America.

As Turner (2023) contends in *New Plants, New Resources, New Knowledge: Early Introductions of Exotic Plants to Indigenous Territories in Northwestern North America,* throughout history, humans have transported plants, animals, and fungal species across the globe, facilitating the spread of knowledge about these species across different cultures, languages, and geographical regions. While some introductions occurred unintentionally, such as the transmission of diseases and the spread of weeds and pests, many species were deliberately brought to new areas for trade or to provide familiar resources for settlers. This exchange has helped make life easier and less risky for migrants seeking familiar provisions.

On the other hand, these exchanges have significantly impacted the environments, languages, and lifestyles of their new regions. By focusing on this influence, we can understand how societies assimilate new entities and experiences into their cultures, whether it's positive or negative changes.

Circling back to Broadleaf Plantain and this apparatus, it was important to me to translate this history and complex relationship between the plant, colonization, and its new environment. I intentionally decided to exhibit the apparatus in a gallery space. Placing the plant there, a space meant for observation and exhibition, exhibiting it on a plinth, and scrutinizing it under a magnifying glass, were all deliberate acts to highlight the studied plant. By situating the plant within this heavily colonial setting, the prototype was designed to prompt contemplation on the impact of human interventions on the environment. The prototype was a satirical approach to the relationship of the plant to colonization, critiquing how colonization has influenced perceptions and interactions with the environment notably Broadleaf Plantain.

Furthermore, this project served as a tangible example of how technology, in this case, the apparatus, mediates the relationships between culture, nature, and human practices. This connects with Demos' (2016) idea that by harnessing the power of creativity and imagination, art can offer alternative perspectives on our connection to the environment. Through visual representation, conceptual abstraction, and emotional resonance, art can provoke viewers to reconsider their understanding of themselves and their relationship with the world around them. This process of reimagining and reinterpreting our place within the natural world is essential for fostering a more harmonious and sustainable coexistence with nature.

To prompt the viewer to consider the topics I'm addressing through this prototype and translate my intention. I accompanied the artwork with an artist statement that reads as follows:

> "The Broadleaf Plantain (Plantago Major) is a perennial weed that was brought to North America through the migration of European settlers. It was categorized as a weed in many parts of the world including Toronto.
> Through this installation, viewers are invited to contemplate the impact of human interventions on the natural world and reconsider their perceptions and interactions with the environment."

When designing the apparatus I wanted to focus on the aspect of intrusion. Going back to when I dug out the plant from the street, I couldn't help but reflect on the violence that came from that activity. I was uprooting a plant from the space it had made its home. The Broadleaf plantain being at the core of this exploration, became the main source of inspiration for the design of the prototype. The plant is characterized by its low-lying, circular leaves that hug the ground and its lack of a prominent stem. When I first found it in the city, I was mostly interested in the way it sprouts through heavy materials like concrete, often only revealing its leaves. I tried replicating this through the design, by carefully installing the plant through a circular incision in the box.

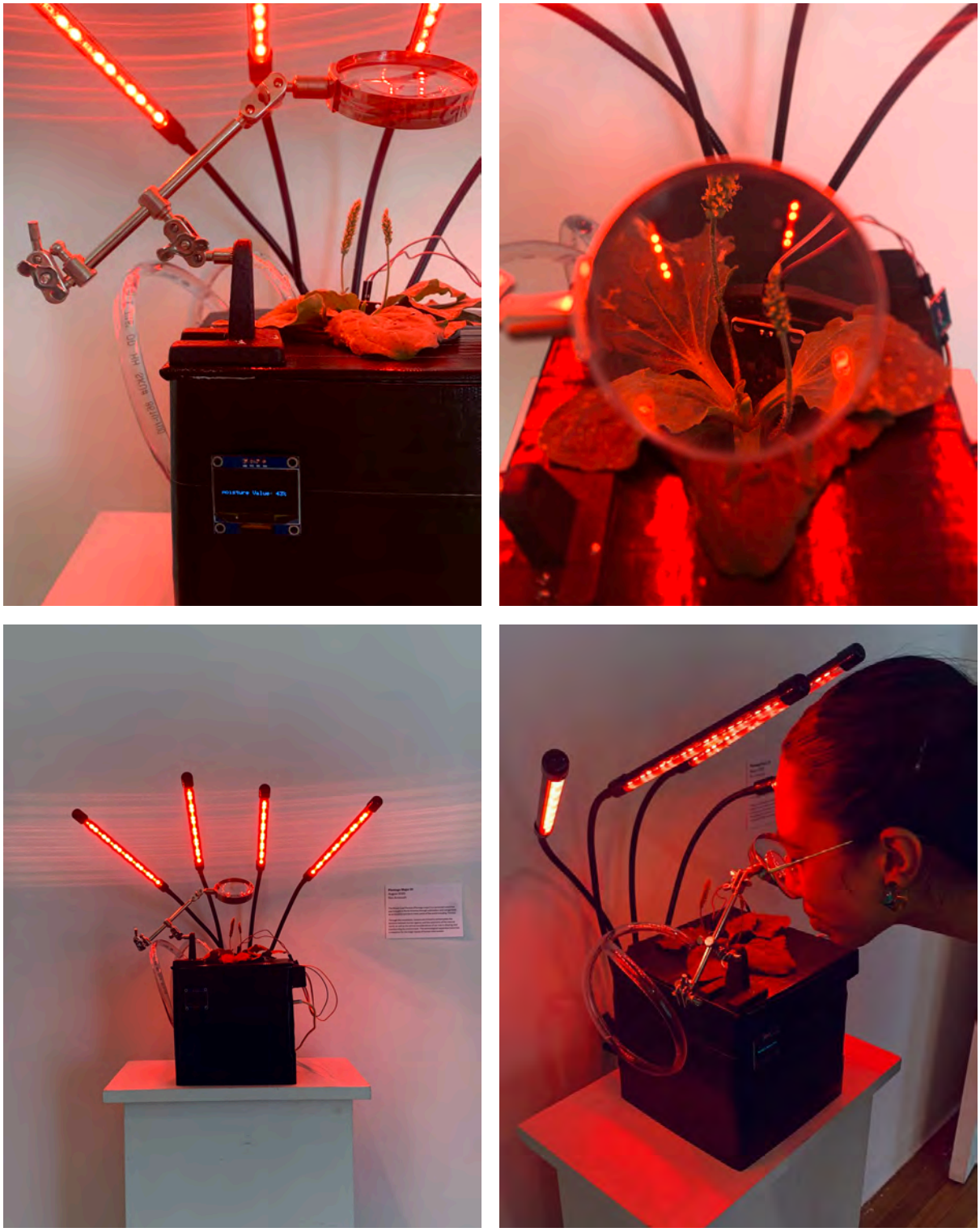

Figure 13 — People who viewed this artwork appreciated the irony embedded in the project—the juxtaposition of using sophisticated technology to nurture and showcase a plant that effortlessly flourishes in its natural urban habitat. This contrast between high-tech equipment and what is viewed as a common roadside weed highlights the absurdity of the human tendency to exert extensive effort and resources on controlling and manipulating nature, even for the most mundane purposes.

Throughout the development of my prototype, I couldn't ignore the parallels between my own research process and the broader themes I was exploring through the artwork. Despite acknowledging that the Broadleaf Plantain wasn't naturally suited to thrive in an indoor gallery environment, I intentionally chose to integrate it into the prototype. This deliberate decision mirrored the historical human inclination to transplant species into new environments. Similarly, in my research process, I utilized sophisticated technology to understand the plant's needs and behaviors. I inadvertently mirrored humanity's ongoing attempts to control and manipulate nature through technological intervention. This realization added layers of complexity to the project, highlighting the intricate interplay between human agency, technological innovation, and the environment. People who viewed the plant immediately recognized it from the streets and were intrigued by its history. A lot of questions were asked related to the plant itself, the choice of technology, and the world in which this apparatus exists. This highlighted the need to translate the history and information about the plant, as well as the broader context of human intervention in natural ecosystems, into a format accessible to a diverse audience.

4.2. Mobile Plant

Expanding from the initial prototype, which served as an informative exploration, numerous questions emerged regarding the choice of technology, its purpose in this investigation, and the overarching goals. The “Plant Incubator prototype” consisted of two main components: the technological apparatus and the artist's statement. The technological apparatus played a pivotal role in facilitating human-plant interaction, primarily focusing on observation. On the other hand, the artist's statement complemented the technological aspect by providing additional guiding information for the viewer, offering insights into the

conceptual framework behind the project and my intentions. At this stage, I aimed to refine both components through iterative development.

In this prototype, the primary emphasis was on the technological apparatus, leveraging technology to augment and propel the historical narrative of the plant. By shedding light on its connection to colonization and human society, the project aimed to highlight the resilience, adaptability, and interconnected relationship between plants and humans. As mentioned previously, the exchange of plants across regions has significantly influenced cultures, languages, and ecosystems, underscoring the intricate interconnectedness between humans and the plant world. Human migration and trade have facilitated the movement of both weeds and cultivated plants across regions, leading to the introduction of new species and the establishment of new plant communities. Plants have been intentionally or unintentionally transported by humans, influencing the distribution and composition of plant populations.

The transition to agriculture during the Neolithic period involved forest clearing through burning, which altered soil quality and vegetation patterns. This practice led to the modification of landscapes and the establishment of new agricultural ecosystems. Moreover, historical events, such as Emperor Bonaparte's Baltic blockade, had significant ecological impacts on regions like eastern America. Economic and political decisions influenced land use patterns, leading to changes in vegetation, loss of biodiversity, and increased forest fires. Human activities, such as land clearing for agriculture and urban development, have resulted in the modification and fragmentation of natural habitats. This habitat alteration has led to the loss of native vegetation and the proliferation of introduced species in some areas. Alternatively, the environment also impacted human activity, with agricultural outcomes often attributed to natural factors like climate and soil quality. Moreover, environmental

conditions influenced migration patterns, economic systems, and ecological balance. For instance, the lack of plant cover and high travel costs deterred migration to certain regions. The need for cheap labor in agriculture, due to the challenging environmental conditions, led to the use of slaves. (Rousseau, 1966, pp. 87-91)

It's worth noting that it is possible to delve deeper into any of the numerous facets of the influence of human intervention on plant dispersal, environmental impact, and cultural transformation. However, this prototype aims to focus primarily on prompting viewers to consider and connect with the broader entanglement of humans and plants. Rather than delving deeply into any one aspect, the project seeks to provide a holistic perspective that highlights the interconnectedness of human and plant lives, inviting viewers to reflect on their own relationships with the natural world and consider the broader implications of human intervention on plant ecosystems and societies.

This resonates with *Seeds of Change*, an ongoing project that I mentioned in the contextual and literature review, through which Alves (1999-present) highlights the historical and cultural impact of the European colonization of the Americas and the intentional and unintentional global exchange of plants, seeds, and knowledge during that time. In that project, they traced back the journeys of the seeds and uncovered specific locations where trades occurred granting them the opportunity to delve deeper into the historical and cultural impact of plant exchanges.

By approaching Broadleaf Plantain through a lens similar to Kimmerer's perspective in *Braiding Sweetgrass*, we can view it not just as a plant, but as a bearer of cultural significance and ecological knowledge. Indigenous peoples' characterization of the plant as the "white man's foot" carries profound symbolism, indicating not only its physical presence

near colonial settlements but also its association with the broader impacts of European colonization on indigenous lands and ecosystems. (Rousseau, 1966, p. 97)

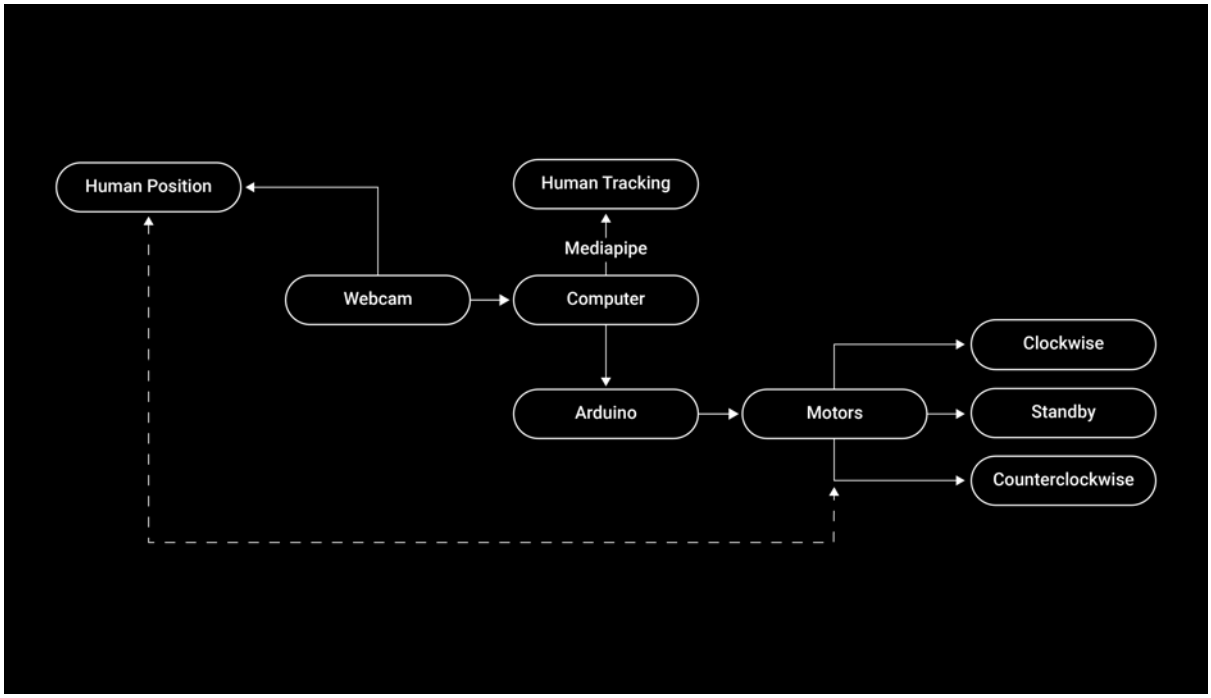

Figure 14 — A camera module powered by computer vision algorithms was set up to detect humans. Upon detecting a human figure, the camera records its position through Mediapipe, an open-source framework developed by Google used to build pipelines to perform computer vision inference over arbitrary sensory data such as video or audio. (Google, n.d.) Once a human position is recorded and processed through Mediapipe, it communicates the information to Arduino, a microcontroller, that activates a set of wheels attached to the prototype, allowing it to follow the individual's movements along a specified line that was drawn to limit the robot's movement.

This prototype is a whimsical fusion of computer vision and Arduino technology, crafted to mimic the migratory nature of the broadleaf plantain and spark curiosity about its historical significance. Inspired by the plant's tendency to trail settlers during their travels, this prototype embodies a playful interpretation of its name “White Man’s Foot”. The decision to implement a line following mechanism was driven by the need to control the robot's movement within a defined area, particularly in an open exhibition space with considerable foot traffic. Considering the scale of the exhibition space and the complexity of managing the robot's navigation in real-time, the line following approach offered a practical

and scalable solution. It leverages relatively simple sensors and algorithms to guide the robot along a predefined path, minimizing the need for complex obstacle avoidance or mapping systems.

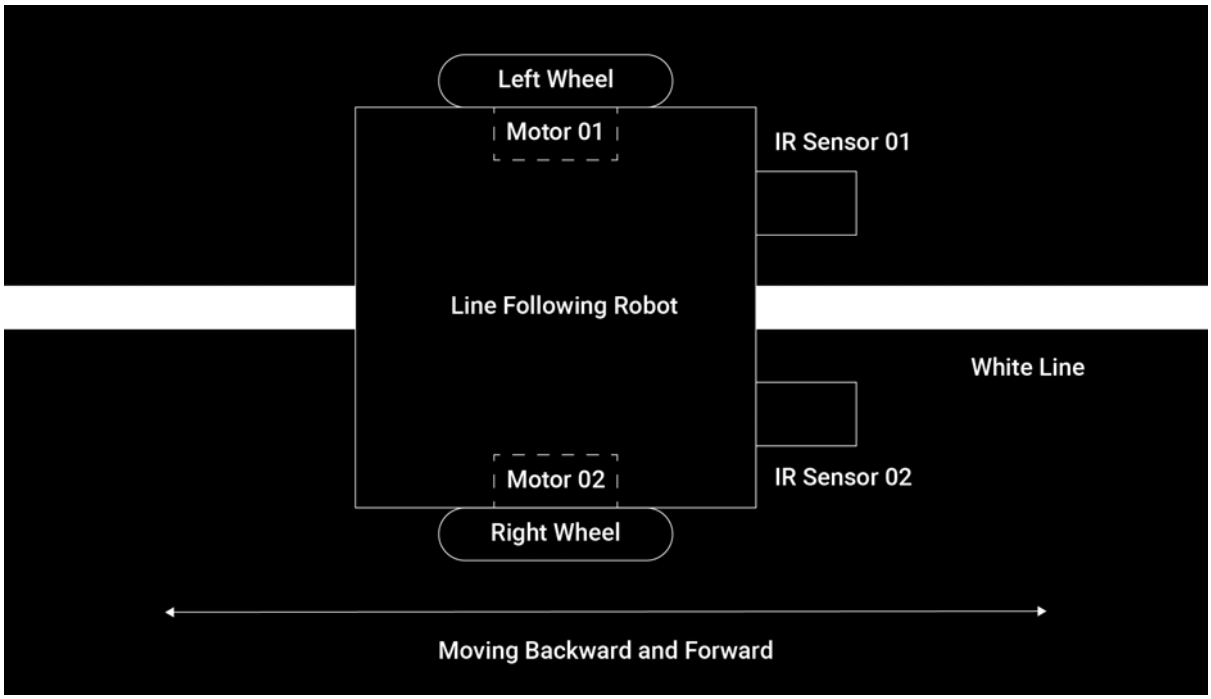

Figure 15 — Illustration of How the Mobile Plant Works

As this device navigates urban landscapes, it symbolizes the historical journey of the Broadleaf Plantain alongside settlers, evoking a sense of intrigue. It aims to raise awareness about the affordances of such encounters and interactions, fostering an understanding of the plant's adaptive behavior and potential collaborations with humans.

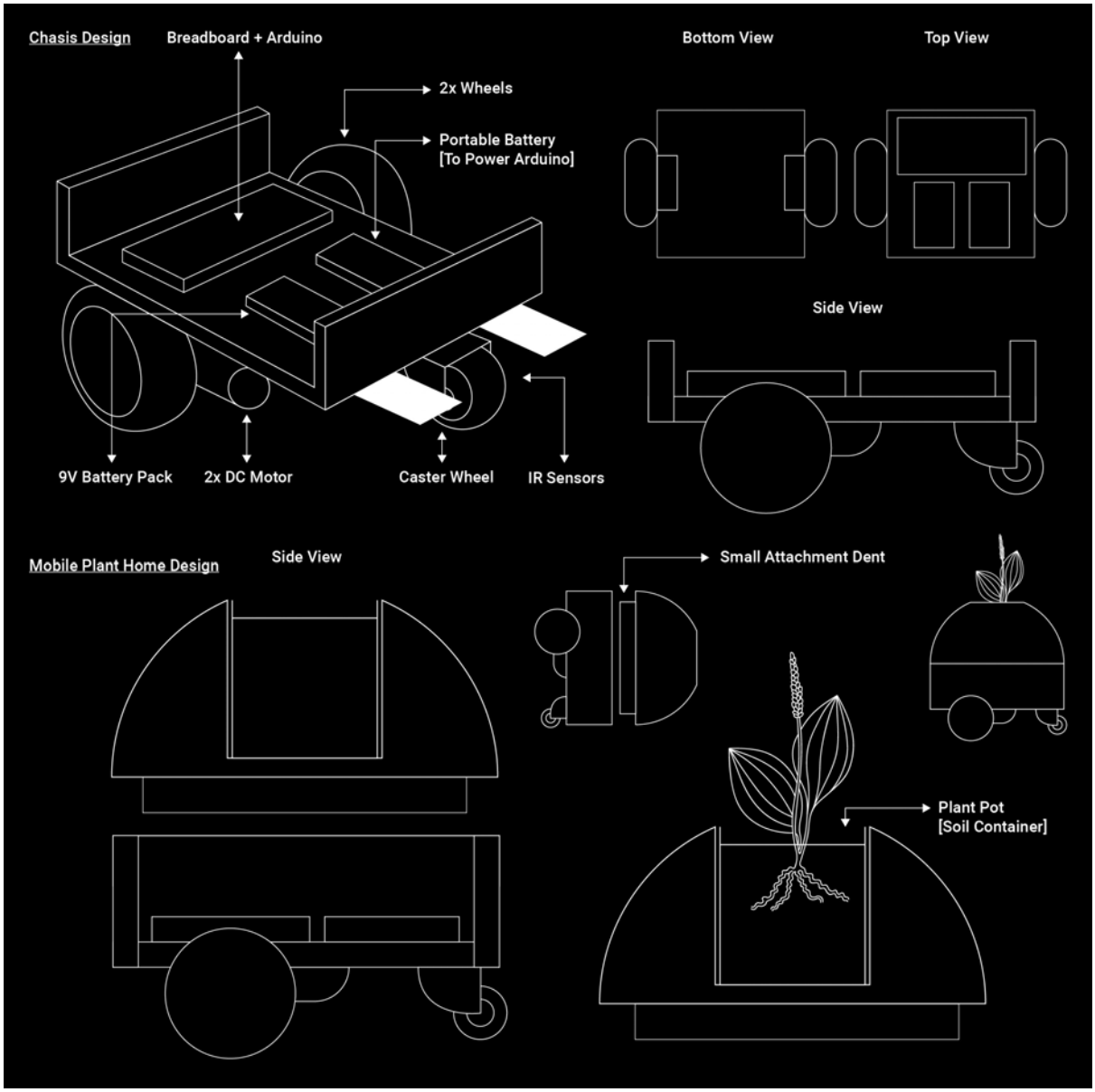

Figure 16 — Deconstructed Illustration of the Mobile Plant

This narrative aligns with Haraway's exploration of how technology shapes our understanding of history and transformation. Just as Haraway (1991) suggests that the cyborg is both a product of imagination and material reality, this prototype serves as a tangible expression of the interplay between human narratives, technology, and the natural world. The selected technology is pivotal for encapsulating the plant's historical narrative in an interactive format, stimulating engagement and exploration among viewers. Through the integration of computer vision and Arduino technology, the prototype not only sparks

curiosity about the Broadleaf Plantain's connection to colonization but also facilitates interaction beyond observation, incorporating movement as well. It aims to raise awareness, foster dialogue, and prompt reflection on human-plant relationships. This technology was selected for its capacity to create an immersive experience, leveraging computer vision for detecting human presence and Arduino technology for enabling autonomous movement.

This resonates with Gould's concept of digital metabolism as outlined in *Kitting the Digital Humanities for the Anthropocene*. Gould (2021) suggests that in the Anthropocene age, there exists a profound interconnectedness between human bodies, cultural technologies, and the environment. This interconnectedness, referred to as digital metabolism, acknowledges the mutual influence and impact between human activities mediated by technology and the surrounding ecosystem. In the case of the "Mobile Plant prototype," the utilization of technology, including computer vision and Arduino technology, exemplifies this interconnectedness. The technology serves as a bridge between human narratives, historical contexts, and the natural world, embodying the concept of digital metabolism by facilitating interaction and engagement with the plant's story.

Similar to the initial prototype, this one also reveals how technology serves as a mediator in the relationships between culture, nature, and human practices. However, in this case, the role of technology goes beyond mere facilitation and observation. the prototype amplifies and augments the migratory aspect of the plant, translating its narrative in a more tangible way. The prototype brings the Broadleaf Plantain's story to life, allowing viewers to directly interact with its narrative in urban landscapes. Moreover, this prototype could work in different urban settings. While currently it is optimized for indoor use, with development and modification, it could be adapted to operate in other public spaces, such as on a sidewalk or in a park, enhancing its accessibility and reach. This flexibility opens up new avenues for

engaging broader audiences and fostering dialogue about the intricate connections between humans, nature, and the built environment.

4.3. Poultice-Making Kit

As I mentioned previously, I conducted a series of land stewardship activities in the High Park area every Thursday between September and December. On October 12, 2023 I wrote the following:

> As I was feeling the first cold breezes of the fall season on my cheeks, I watched a girl get stung by a bee. The tiny insect clung so tightly to her skin, specifically her right shoulder, that it made me question what it was that made the bee want to so persistently attach itself to the girl. Could it have been drawn to the apple the girl was nibbling on? After all, It was the start of the fall season, when bees collect food to sustain their colony through the colder months. The girl proceeded to very carefully move the bee away, making sure not to injure its small body. She knew that she was in bee territory and that her chances of getting stung by a bee were high. However, the most intriguing part followed shortly after. One of the people accompanying her rushed to grab some plantain leaves and instructed her to chew on them to make a poultice to soothe the inflammation that was caused by the sting. This encounter made me interested in learning more about the Broadleaf Plantain as a healing plant.

About a month later, I decided to delve deeper into the Broadleaf Plantain poultice and its preparation, only this time, I was going to conduct my investigation on the sidewalk where I first encountered this plant species. On a sunny Sunday towards the end of November, I decided to go for a walk around the city knowing that despite the cold temperatures I would still come across some Broadleaf Plantain. I noted the following:

> As I wandered through different areas, the plant revealed itself in the middle of a pile of fallen autumn leaves. I eagerly gathered some leaves, examining each leaf meticulously. The veins, the textures - every detail held significance. I went for the greenest and the youngest leaves, I knew that their freshness would make them juicier and easier to chew, an essential criterion for crafting the healing poultice. Taking a moment to prepare, I squished and bent the leaves between my fingers, trying to make the job easier. As I put the leaves in my mouth, I wasn't too surprised by their bitterness. Chewing on the leaves, I could feel every single particle blending with my saliva, sticking to the roof of my mouth and teeth. At that moment, a realization stuck - this was a collaborative dance, a symbiotic exchange where both the plant and I

> contributed to creating a healing poultice. In that intimate moment, I felt deeply connected to the plant I had been encountering on the streets.

Upon reflecting on the creation process of the Broadleaf Plantain poultice, and how easy it was to make it, I found myself contemplating its relevance in today's society. It struck me that whenever something natural proves beneficial to humans, it often gets transformed into a marketable product, a commodity, to meet capitalist demands. Intrigued by this, I decided to explore what products were derived from Broadleaf Plantain. I discovered it in various forms such as dried leaves for tea, skin salves, and children's tinctures. Interestingly, these products seemed to be primarily sold in natural herb stores or on platforms like Etsy, known for their focus on handmade items. As I delved deeper into this realization, I couldn't help but wonder about the potential for Broadleaf Plantain to become heavily commercialized.

Many of the key phytochemicals produced by plants, including those found in Broadleaf Plantain serve as defense mechanisms against environmental stresses encountered in the wild. These stresses, such as heat, drought, and attacks by insects, bacteria, or fungi, prompt plants to produce high levels of these chemicals to protect themselves. (Kumar et al., 2023) Studies on Plantago species have identified approximately 60 secondary metabolites, including phenylethanoid glycosides, triterpenoids, polysaccharides, phenolic acids, and other compounds like alkaloids, caffeic acid derivatives, coumarins, fats and oils, mucilage, sterols, and volatile substances. (Samuelsen, 2000) However, when we cultivate plants in controlled environments using advanced technology, we often provide optimal growing conditions that minimize these stressors. As a result, many of these defense chemicals are either lost or produced at significantly lower levels. In the pursuit of efficiency and standardization, the

inherent resilience and complexity of plants grown in their natural habitats may be overlooked. (Kumar et al., 2023)

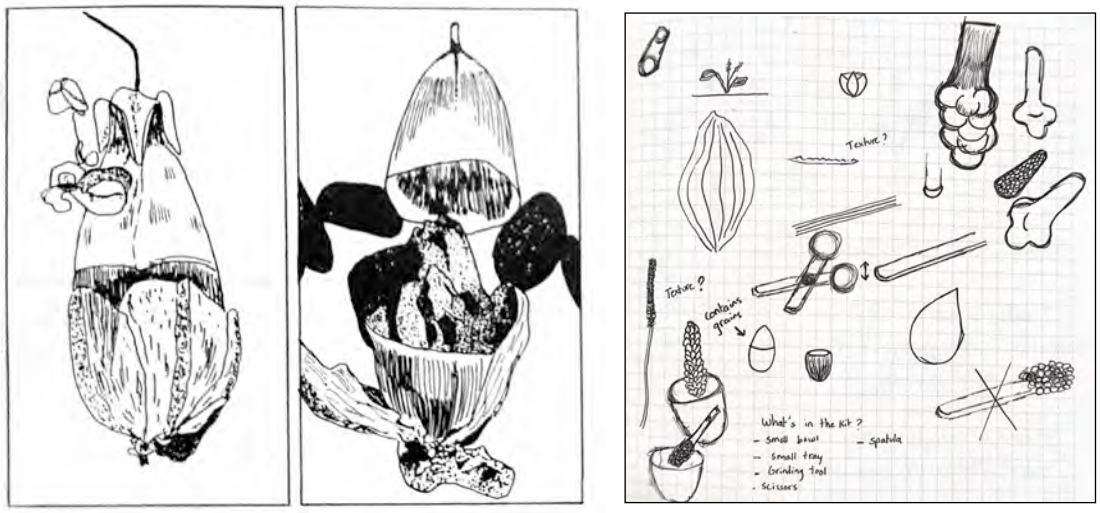

Figure 17 — Fruits of P. major Showing the Position of the Seeds. Adapted from "Plantago: A Multidisciplinary Study" by P.J.C. Kuiper and M. Bos, illustration by A. Du Bois-van Heezik. & Sketches of the Kit Utensils. Link to webpage

This train of thought led me to envision the development of a poultice-making kit specifically tailored for Broadleaf Plantain. The kit consisted of essential tools such as a mortar, pestle, spatula, pruning scissors, and medical bandages. Each tool was selected to facilitate the creation of the poultice effectively. Since it's a kit tailored specifically for Broadleaf Plantain, I found inspiration in the plant's anatomy.

The pestle's design is reminiscent of the seed capsules found on the plant's spikes, also known as the flower head. Its shape and texture emulate the organic structure of these capsules, providing both functionality and visual appeal to the tool. Similarly, the spatula exhibits a subtle fold, mirroring the thick leaf stems that converge at the base of the plant. Moreover, the cohesive design of the entire kit evokes the concept of a seed container. The tools nestle neatly inside the bowl, resembling the arrangement of seeds within a plantain's

seed capsule. To enhance practicality and portability, the tools are encased in a fabric pouch. The pouch is thoughtfully crafted to resemble the plant's leaves extending from a low-lying circle at its center, ensuring that the tools remain securely in place during storage and transportation.

Figure 18 - Documentation of the Poultice-Making Kit on the Streets

My exploration of Broadleaf Plantain and its potential commodification resonates with some of the themes present in Tsing's (2015) *The Mushroom at the End of the World*. Tsing's work examines how certain non-human actors, like mushrooms, exist and thrive in the interstices of capitalist systems, often through processes of resilience and adaptation. Similarly, the leading narrative in this prototype touches upon the coexistence of nature and capitalism, where the healing properties of plants like Broadleaf Plantain can be both appreciated for their intrinsic value and potentially exploited for commercial gain. Moreover, envisioning a poultice-making kit tailored specifically for Broadleaf Plantain illustrates the commodification of nature and the ways in which capitalist systems seek to package and sell even the most intimate interactions with the environment. This parallels Tsing's discussion of the marketization of mushrooms and other “wild” goods in their book. The transformation of

natural elements into marketable products reflects Tsing's notion of the "salvage accumulation" process, where entities find ways to extract value from what might otherwise be considered waste or marginal resources. (p. 63).

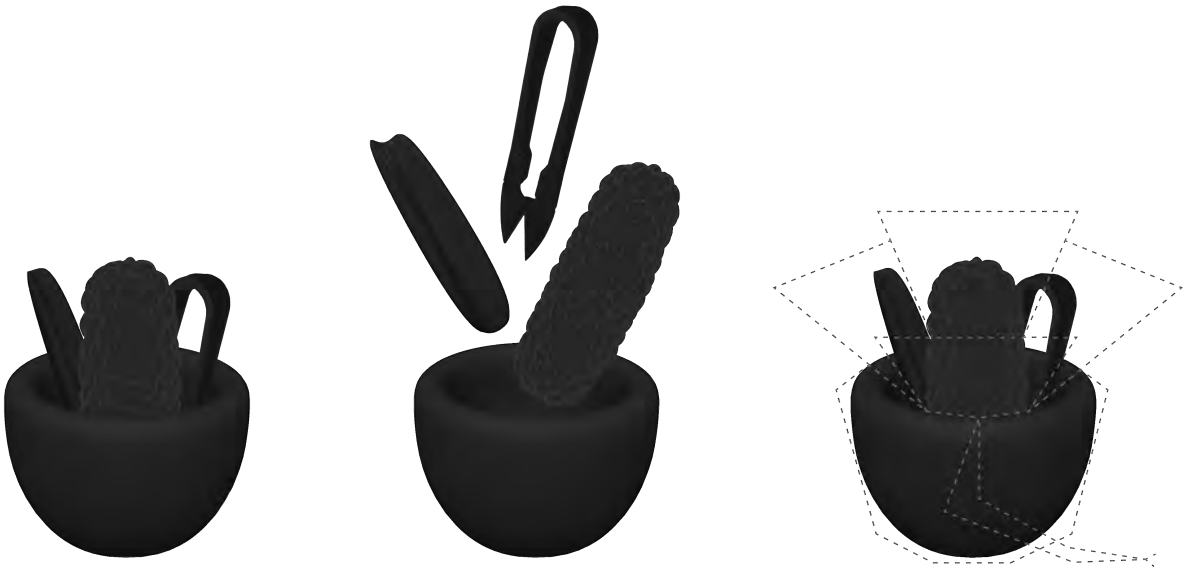

Figure 19 - 3D Renders of the Poultice-Making Kit

The video documentary further expands on these themes by offering a visual narrative of my engagement with the plant and its materiality, highlighting the intricate processes involved in crafting the poultice and the collaborative relationship between humans and nature. This mirrors Tsing's exploration of the material practices and ecological interactions that shape our world. My portrayal of the Broadleaf Plantain poultice as a collaborative effort between me and the plant echoes Tsing's emphasis on multispecies entanglements and the interconnectedness of human and non-human agents.

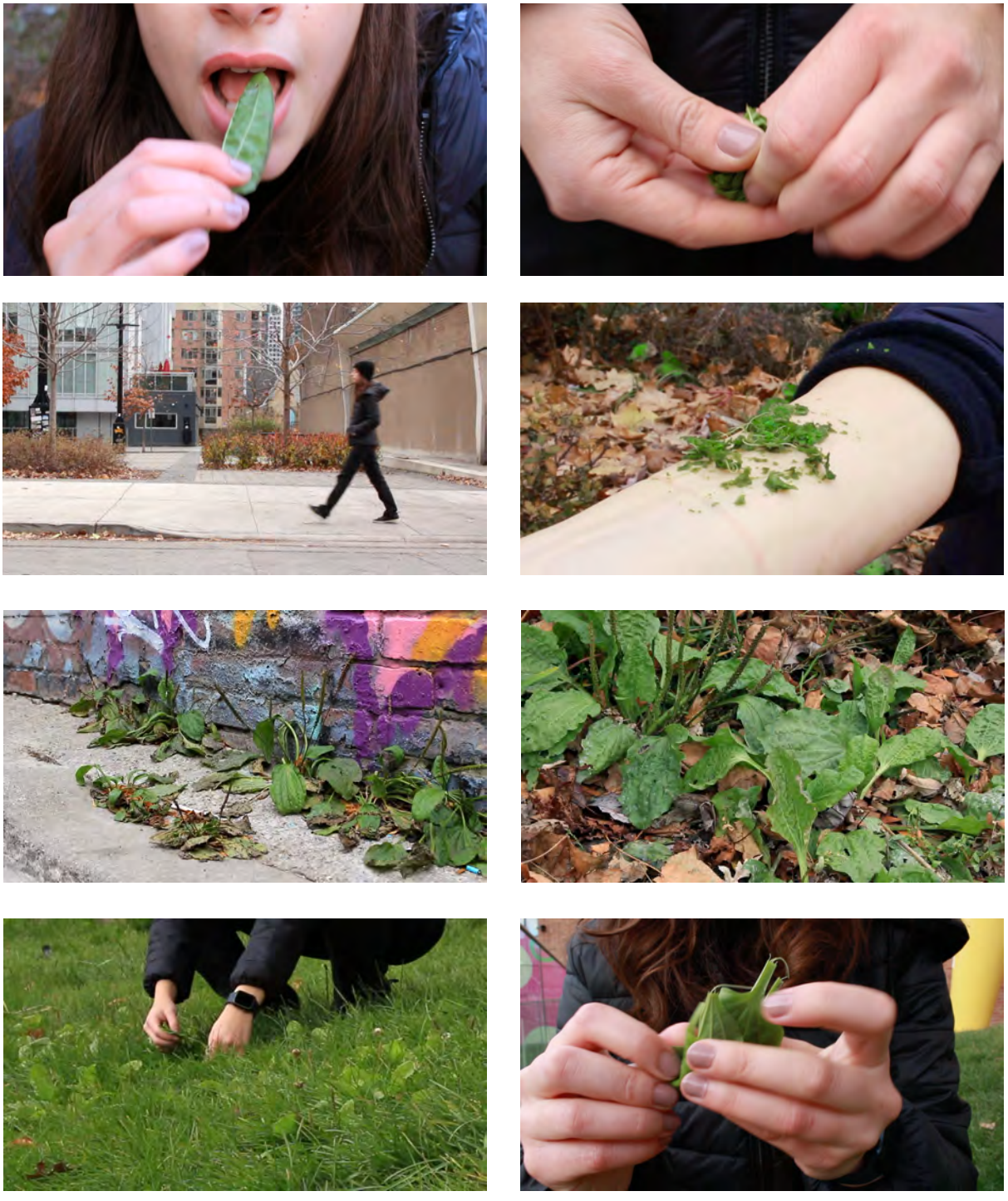

Figure 20 — Stills from the Short Documentary Video

My exploration of Broadleaf Plantain's journey from the sidewalk to the marketplace underscores the need for a nuanced understanding of our relationship with nature and technology. While advancements in cultivation and extraction techniques have expanded our

access to plant-based remedies, they also pose challenges to preserving the integrity and diversity of natural ecosystems. As we navigate the complex terrain of herbal medicine and sustainability, it is crucial to recognize the inherent value of plants grown in their native environments.

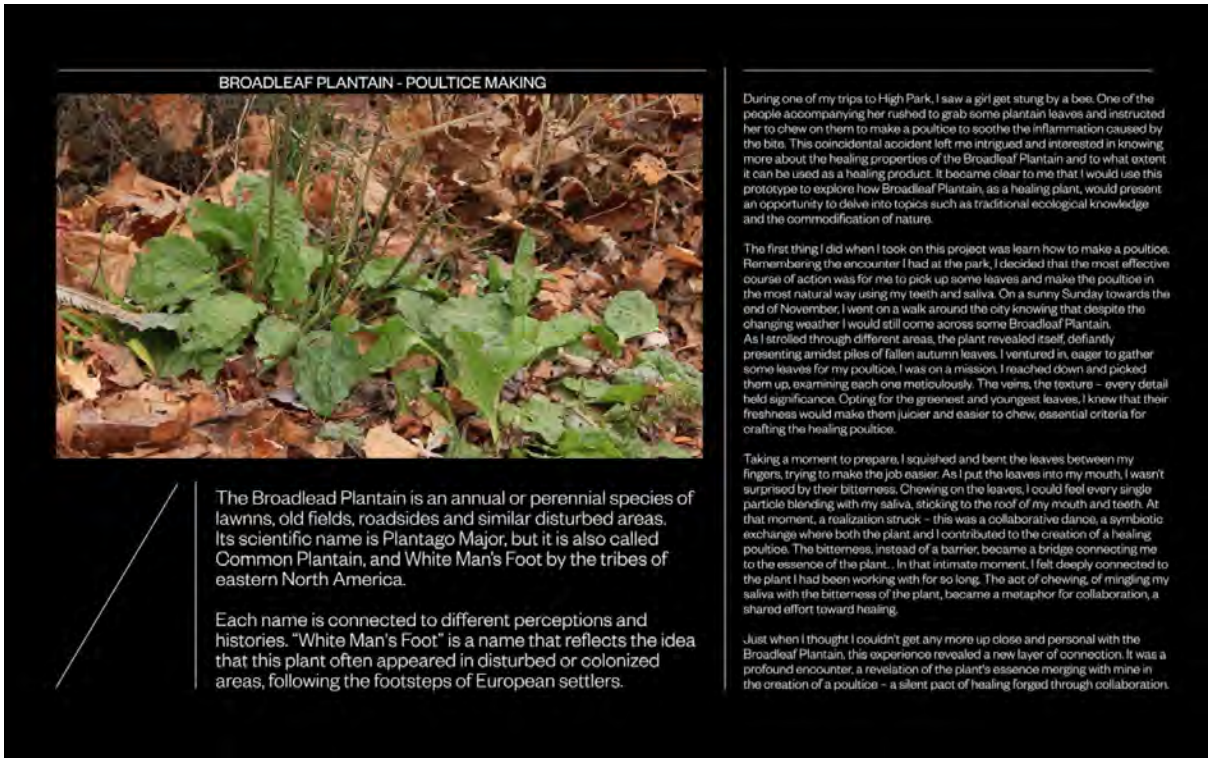

Figure 21 — Documentary Video and Story Behind the Prototype During Exhibition

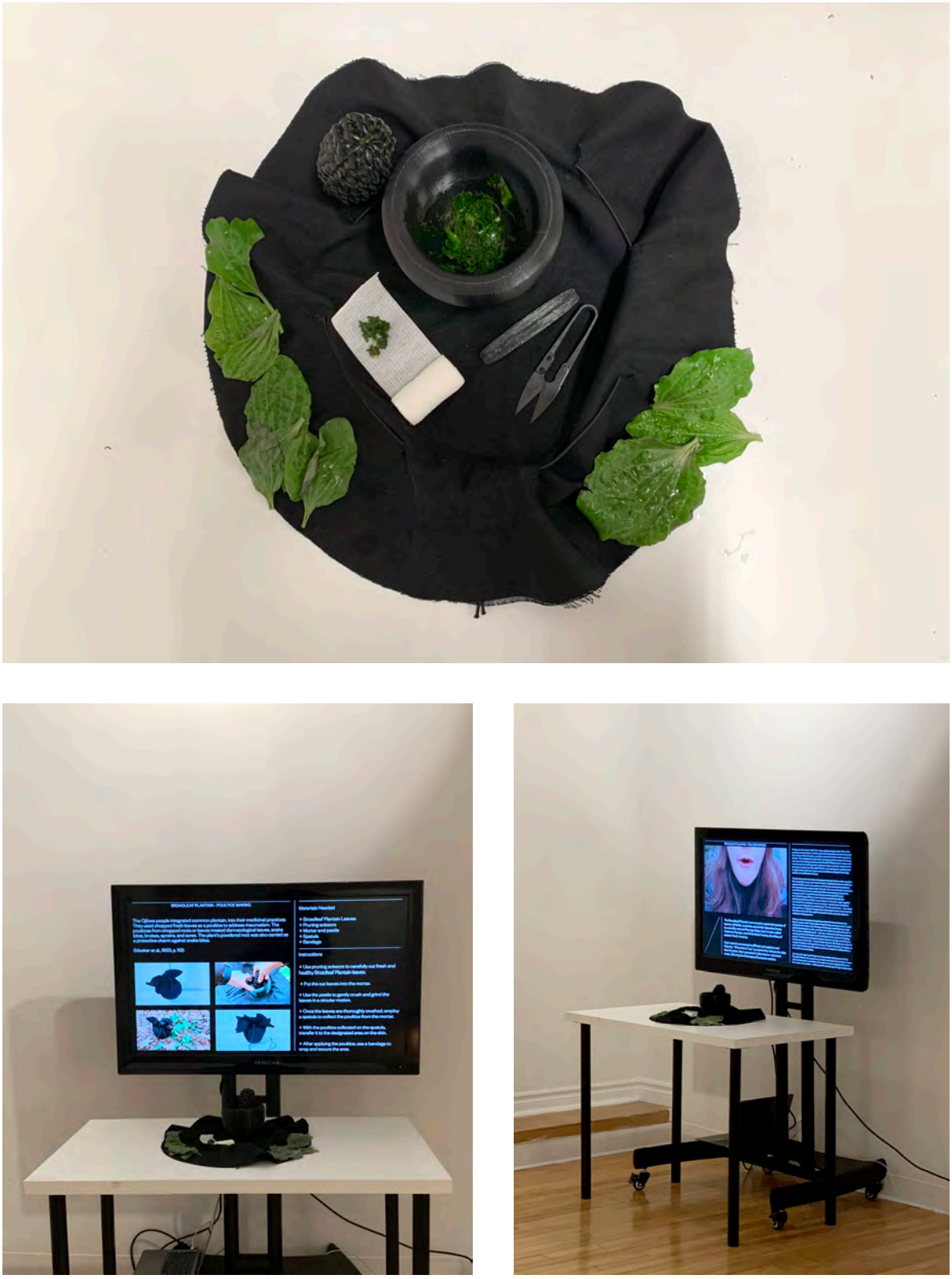

Figure 22 — Poultice-Making Kit at the Digital Futures Open Show

5.0. Project Result & Exhibition

The development of the prototype I'm about to introduce was not an isolated endeavor, it emerged as a direct response to the insights and feedback collected from the exploration and experimentation with the three earlier prototypes: the “Plant Incubator,” the “Mobile Plant,” and the “Poultice-Making Kit.” Each of these prototypes delved into the intricate relationship between technology, nature, and human intervention, offering unique perspectives on how we interact with the environment.

5.1. Broadleaf Plantain Map

As discussed in the literature and contextual review, Zapf (2016) contends in the *Handbook of Ecocriticism* that ecocritical perspectives should underscore the interdependence between language, literature, and other forms of artistic expression within natural and cultural ecosystems. This approach advocates for a comprehensive examination of these domains from various perspectives, taking into account their co-evolutionary dynamics with natural ecosystems, their interactive impacts on different cultural spheres, and their inherent capacity for self-organization. Adopting such a holistic perspective encourages an understanding of the complex interplay between human and non-human elements within ecological systems without reducing one to the other. This interconnected evolution implies that language, literature, and art are not only influenced by the natural world but also play a role in shaping it. Additionally, the term “naturecultures,” as discussed by Latimer & Miele (2013) and popularized by Donna Haraway, presents an interesting opportunity here as it challenges traditional notions of nature and culture as separate entities. Instead, it emphasizes their inseparable entanglement, suggesting that they co-constitute each other. This concept underscores how our cultural perspectives shape our understanding and perception of the natural world.

Applying these frameworks to the study of the Broadleaf Plantain, I found that its existence is tied to both natural and cultural contexts. Traditionally, “wildness” has been perceived as the absence of human intervention. However, in the Anthropocene era, characterized by pervasive human influence and rapid environmental change, it is the opposite. Human perceptions and interactions with nature are not static but continuously evolve alongside ecological changes. Therefore, understanding the plant's existence requires considering both its natural habitat and the cultural contexts in which it is situated, as they have co-evolved and continue to influence each other in the Anthropocene era.

By delving into the cultural dimensions of the Broadleaf Plantain's habitat, I gained a deeper understanding of its significance and resilience. Through this research, I created a map representing the anthropogenic ecosystem surrounding the plant, illustrating the intricate network of interactions between human activities, ecological processes, and cultural perceptions. This map serves as a tangible output of exploration, revealing the complex relationships between humans and nature and highlighting the need for integrated approaches to ecological understanding. Embracing Zapf's call for holistic ecocriticism, in this case, pushed me to recognize Broadleaf Plantain not just as a botanical entity but as a cultural and ecological phenomenon. Its existence and adaptation reflect the interconnectedness of human and non-human realms, urging us to rethink our relationship with the natural world in the face of current environmental challenges.

The map acts as a comprehensive visual representation that deepens viewers' understanding and fosters a more meaningful connection with the plant. The map is designed to be informative and engaging, offering a multi-faceted perspective on Broadleaf Plantain from various angles such as ecological, social, historical, economic, and medicinal. Each aspect is visually represented through carefully curated content, including text, images,

videos, and illustrations. This approach ensures that the map appeals to a wide audience, from casual observers to those with a deeper interest in the plant.

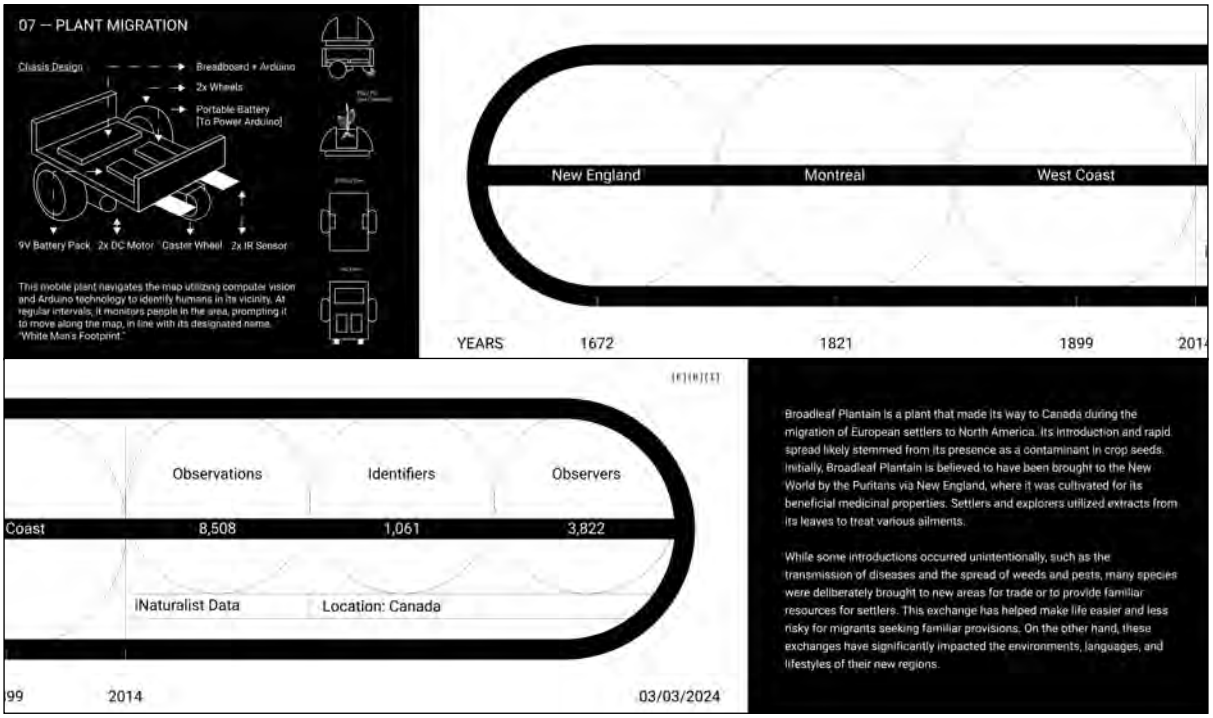

Figure 23 — Close-up on the plant migration section, area where the line following robot was moving.

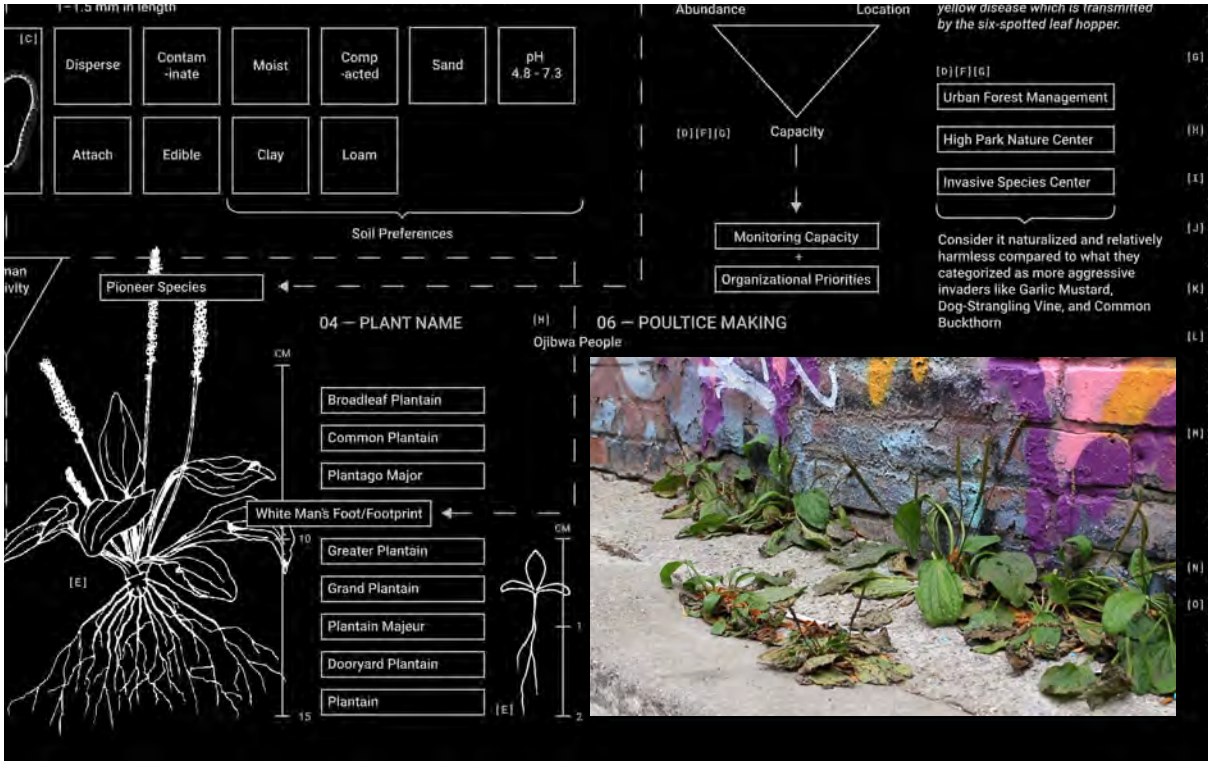

Figure 24 — Close-up on the Poultice-Making video

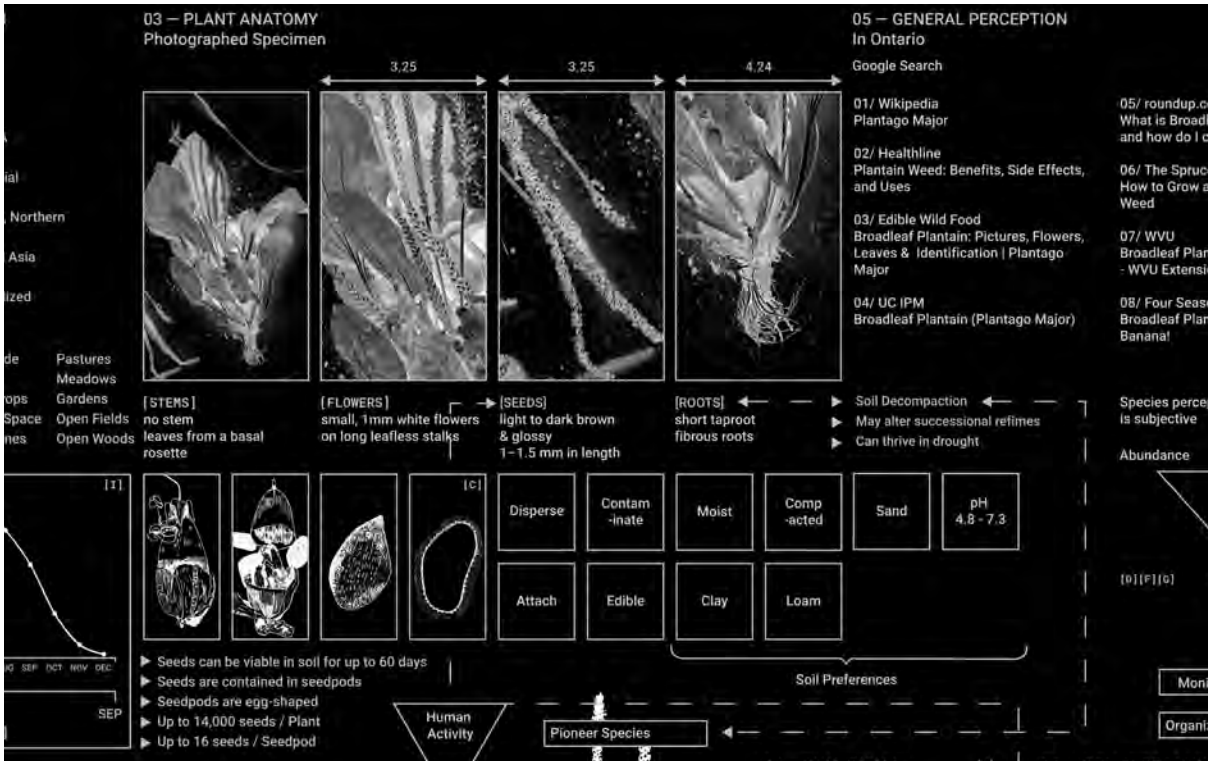

Figure 25 — Close-up on the plant anatomy section

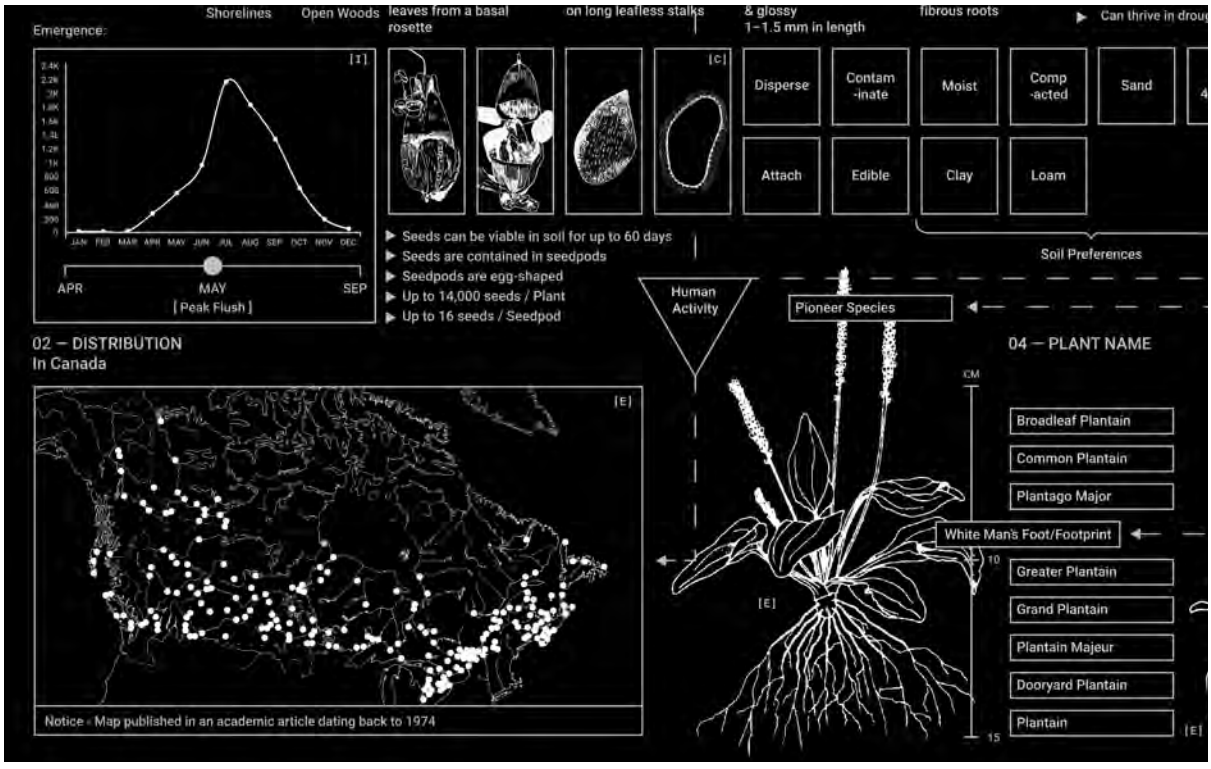

Figure 26 — Close-up on the species information and distribution section

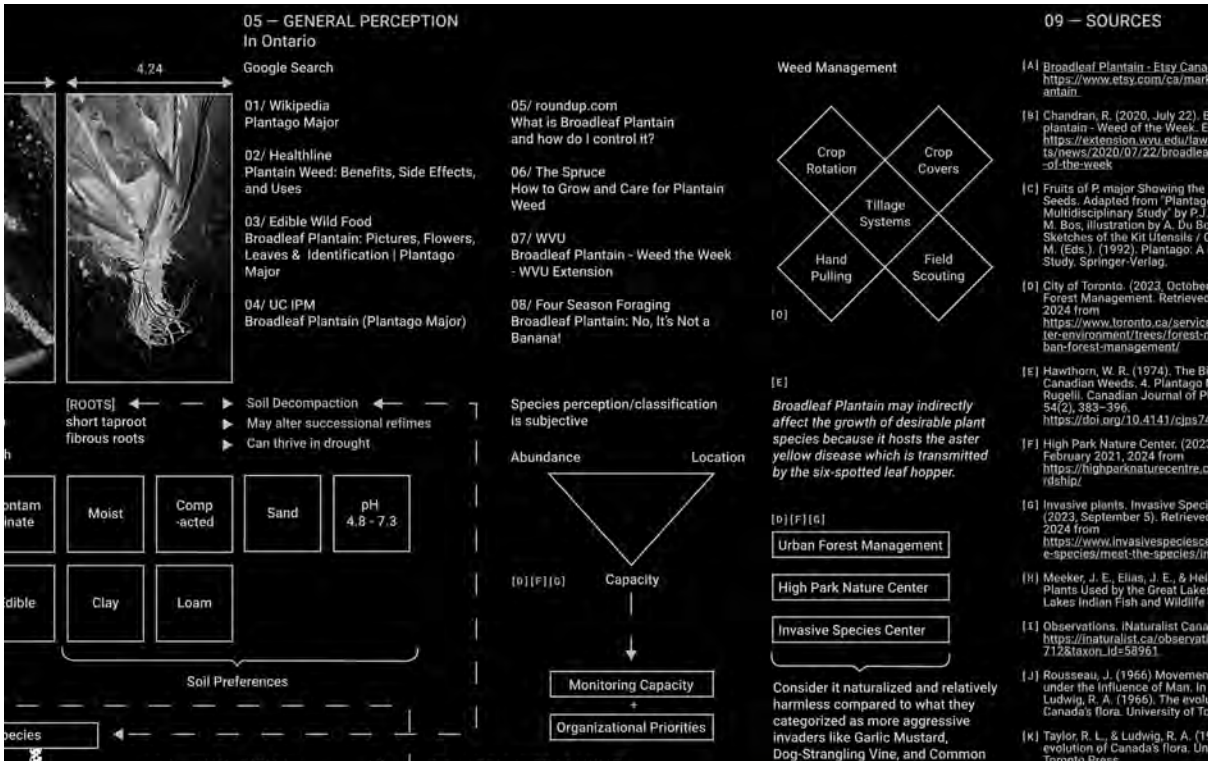

Figure 27 — Close-up on the general perception of the plant drawing insights from a Google search, and Ontario-based organizations such as Urban Forest Management, High Park Nature Center, and Invasive Species Center.

In essence, this project underscores how the integration of technology enables interdisciplinary exploration by merging ecological research with cultural studies, art, and literature. Through the synergistic combination of art and technology, this project demonstrates how creative expression can serve as a powerful medium for communicating complex ecological concepts to a diverse audience. The interactive map, at the heart of this project, serves as a dynamic platform for engaging with ecological research in a visually compelling and accessible manner. The map communicates the intricate relationships between human activities, ecological processes, and cultural perceptions within the plant's ecosystem. It not only provides viewers with essential information about the plant and its significance but also invites them to reflect on their own position within the broader ecological landscape. Moreover, the map serves as a catalyst for stimulating reflection and dialogue on viewers' own relationship with nature. By prompting viewers to consider their

role within the plant's ecosystem and encouraging them to reflect on their own interactions with the natural world, the map fosters a deeper understanding of the interconnectedness of all living beings. Through this process of self-reflection and dialogue, viewers are empowered to develop a more profound appreciation for the complexities of ecological systems and the need for sustainable and harmonious coexistence with nature.

5.1. Final Exhibition

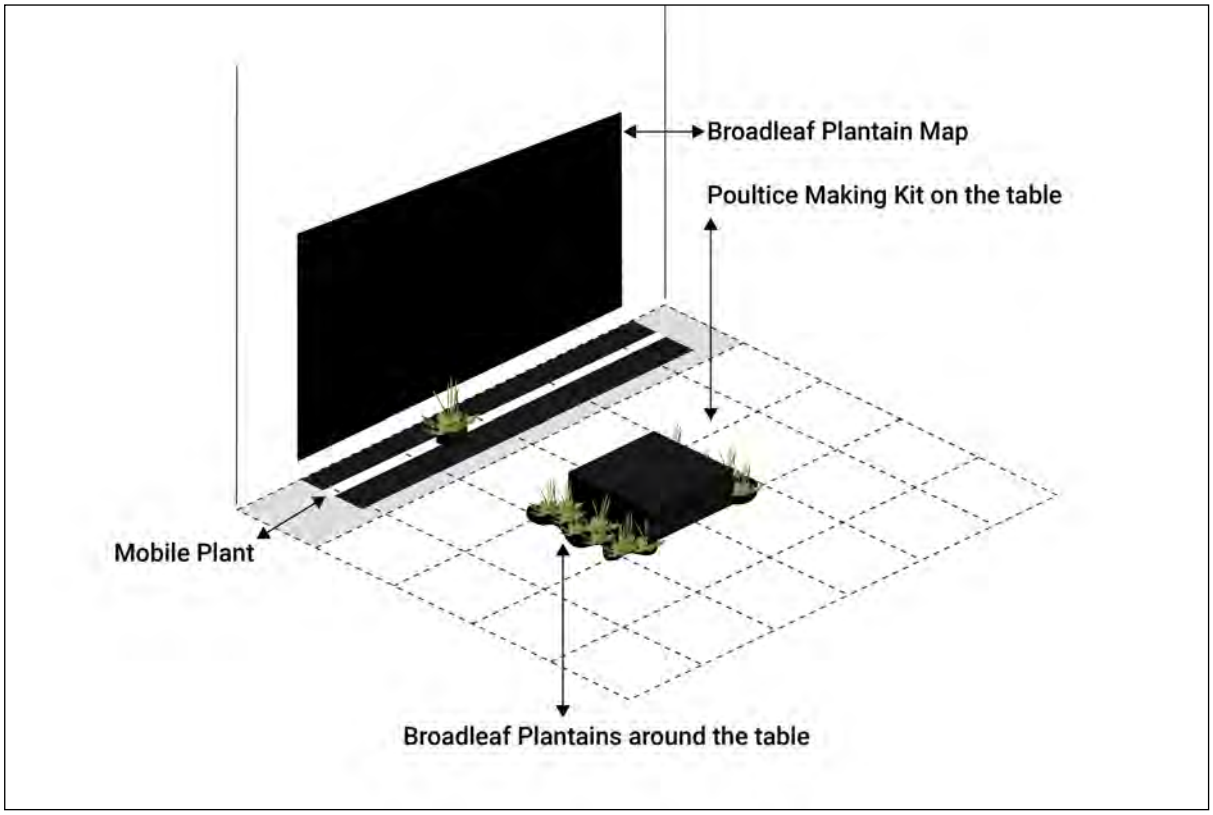

Figure 28 — A sketch depicting how the exhibition space was activated.

I designed the installation space with an aim to push people to interact with the objects however they wanted starting from anywhere. The experience was meant to be an immersive and enlightening experience, inviting visitors to embark on a journey similar to mine of discovery through the interconnected realms of ecology, culture, and human interaction with nature. The exhibit showcased: the “Mobile Plant,” the “Poultice-Making Kit,” and the “Broadleaf Plantain Map.” Together, these components offer a multifaceted

exploration of the Broadleaf Plantain and its significance.

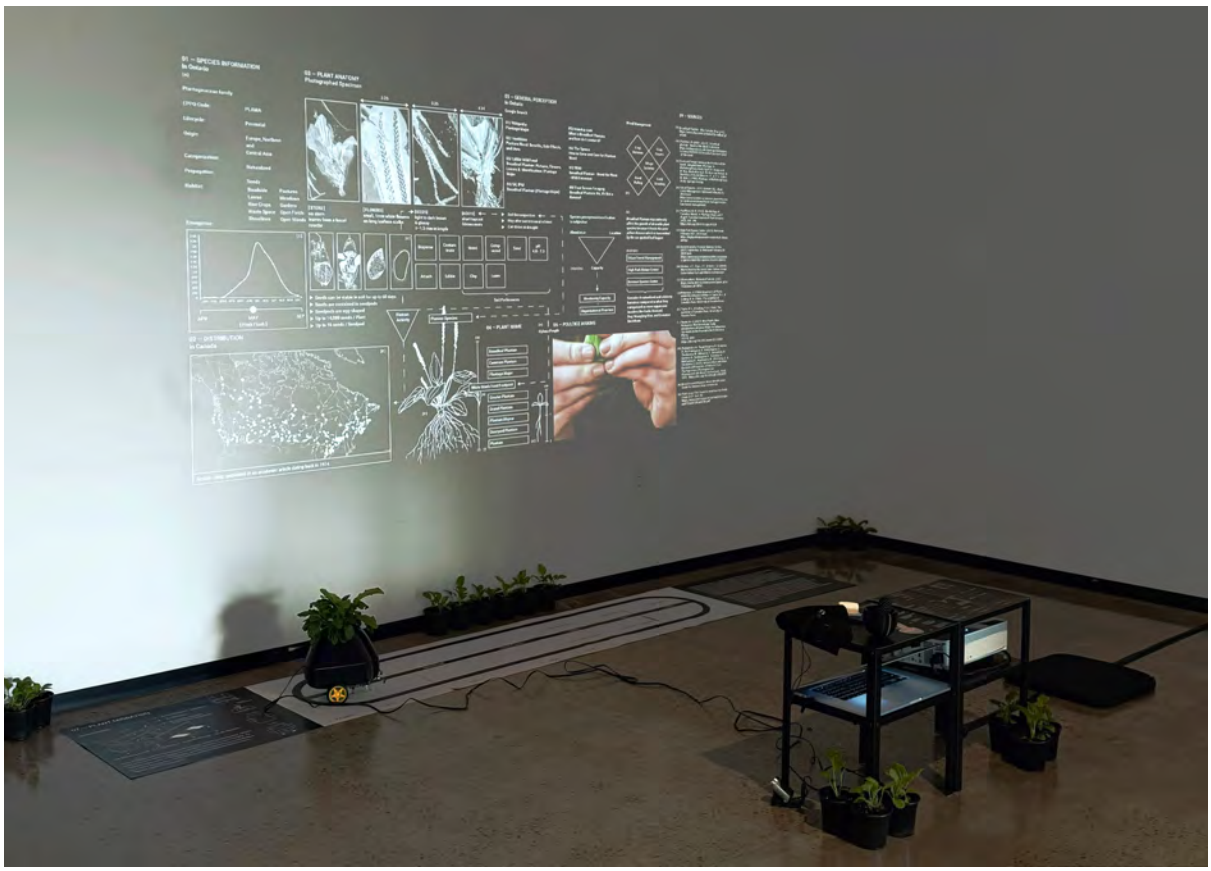

Figure 29 — The exhibition space included the three prototypes and multiple Broadleaf Plantain specimens, not exhibited for mere observation, but as recognition as active participants in the research.

The “Mobile Plant” draws attention to the migratory aspect of the Broadleaf Plantain, shedding light on the intricate relationship between human activity and the movement of plant species. Meanwhile, the “Poultice-Making Kit” offers insights into the commodification of nature, exploring the plant's medicinal significance and its role in traditional healing practices. Central to the exhibition is the “Broadleaf Plantain Map” that connects the other prototypes. This comprehensive visual representation not only provides an overview of the plant's ecological significance but also delves into its cultural and historical contexts. By seamlessly integrating insights from the “Mobile Plant” and the “Poultice-Making Kit”, the

map weaves together a cohesive narrative that highlights the plant's multifaceted existence. I sought to strategically arrange the kit and the robot prototypes to serve as extensions to the "Broadleaf Plantain Map".

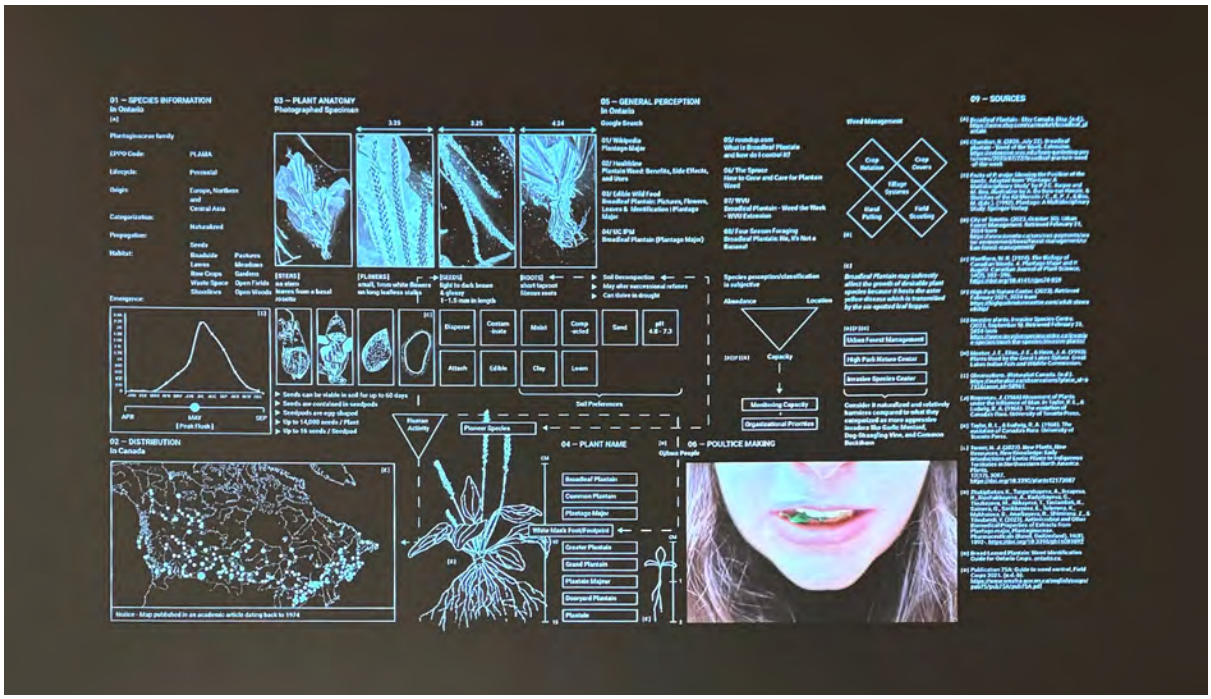

Figure 30 — Broadleaf Plantain map projection offering additional layers of information and engagement.

Figure 31 — Mobile Plant Prototype moving along the designated track.

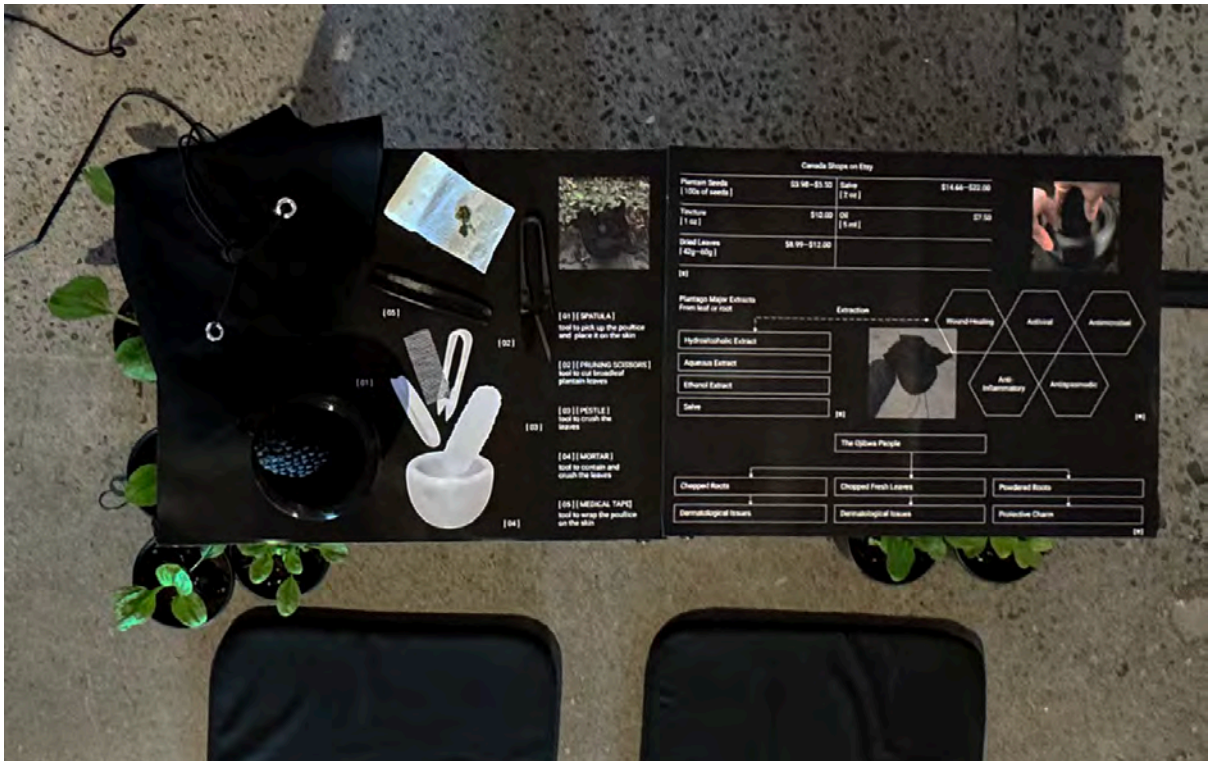

Figure 32 — Poultice-Making Kit station where viewers were invited to make their own poultice.

Visitors were encouraged to move freely throughout the space, interacting with the artworks and plant specimens. By fostering a sense of connection and interaction, the exhibition aimed to deepen viewers' appreciation for the interplay between humans and nature while sparking meaningful dialogue and reflection on our relationship with the natural world.

6.0. Concluding Reflections and Future Directions

6.1.Conclusion

Ecocritical installations have the potential to contribute to the decolonization of our perceptions of the environment by questioning the boundaries between nature and culture. Informed by cultural ecology and postcolonialism, they highlight the interconnectedness between human and non-human elements, emphasizing that nature is not entirely separate from human influence. These installations explore the complex relationships between humans, cultural practices, and the natural world, drawing on frameworks like "naturecultures" to illustrate their co-constitutive nature. Indigenous knowledge systems prioritize interconnectedness and reciprocity, contrasting with Western perspectives that often reinforce hierarchical systems with humans at the top. The "Mobile Plant" prototype and "Broadleaf Plantain Map" exemplify this approach, blurring boundaries between nature and culture while illustrating the intertwined relationship between human activities and the natural world. The first symbolizes the historical journey of the plant alongside settlers, challenging notions of nature as separate from human influence, while the map delves into the cultural dimensions of the plant's habitat, demonstrating how human actions shape and are shaped by the natural world.

Ecocritical installations can serve as critical tools for challenging the objectification and exploitation of nature, aiming to foster more equitable and sustainable relationships. By scrutinizing traditional Western concepts of nature that prioritize human dominance and exploitation, these installations highlight flaws in prevailing narratives. The emergence of postcolonial ecocriticism aims to address the dominance of economic interests and capitalism on environmental issues, bridging gaps between postcolonial studies and ecocriticism. Integrating this framework into ecocritical installations allows for critiques of power

dynamics, exploitation, and environmental justice in postcolonial contexts. Supported by Demos' (2016) critique of the objectification of nature and Haraway's (2016) examination of "Cheap Nature," these installations raise awareness about the consequences of human actions on the environment and advocate for more responsible relationships with nature.

Ecocritical installations have the potential to elevate indigenous knowledge and perspectives, offering alternative paradigms to challenge Western dominance in environmental discourse. Through a review of literature and context, it became evident that these installations offer the possibility to re-center relationships with the land on principles of reciprocity, respect, and stewardship, integrating indigenous cultural practices and traditional ecological knowledge. However, it's crucial to acknowledge that while amplifying indigenous knowledge, ecocriticism must avoid perpetuating "Green Orientalism" and oversimplifying indigenous relationships with the environment, as highlighted in Banerjee's (2016) work. In my prototyping endeavors, I aimed to critique Western perspectives rather than romanticize indigenous practices. Both the "Plant Incubator" and "Poultice-Making Kit" prototypes served as experiments in critiquing the objectification and exploitation of nature. The former challenged human attempts to control natural ecosystems, highlighting the irony of human intervention, while the latter examined the commodification of herbal remedies derived from the Broadleaf Plantain, raising awareness of the complexities of herbal medicine and the importance of preserving natural ecosystems.

The incorporation of digital technologies into ecocritical installations presented opportunities to challenge conventional distinctions between humans, machines, and nature, emphasizing their interconnectedness. Throughout the research, technology emerged as a key mediator in shaping human perceptions and interactions with the environment, drawing on concepts like "Digital Metabolism" by Gould (2021) and Haraway's (1991) discussion on

technological augmentation of organism abilities. The creation of the “Broadleaf Plantain Map” prototype exemplified this, using digital tools to represent diverse cultural perspectives on environmental interactions and offering insights into varied community engagements with nature. This prototype, along with the “Mobile Plant,” demonstrated how technology can enhance narratives and engage viewers in playful interactions, fostering affective engagement with the artwork. Additionally, the research explored technology's role in facilitating communication and education about ecological processes, cultural exchanges, and historical narratives, as seen in the digital storytelling techniques employed in the “Poultice-Making Kit” exhibition.

The placement of the Broadleaf Plantain as the focal point of this research significantly influenced its trajectory and depth. This plant served as a cornerstone, allowing for a focused yet comprehensive exploration of various aspects related to the environment. Its historical, cultural, and ecological importance provided a rich framework for discussions, guiding the exploration of diverse socio-political themes. Through the lens of the Broadleaf Plantain, the research naturally extended to discussions on cultural attitudes towards nature and the impact of historical contexts on human-environment interactions. Additionally, the plant's traditional healing properties sparked discussions on the commodification of nature and the ethical considerations surrounding the commercialization of natural resources. By integrating the Broadleaf Plantain into the prototypes, the research facilitated dialogue and encouraged viewers to reevaluate their perceptions and engagements with the natural world.

In embarking on this research, I was interested in exploring the potential of ecocritical installations to influence perceptions of the urban environment, aiming for broader societal change. I hypothesized that by offering alternative perspectives and promoting interconnectedness, respect, and reciprocity, these installations could contribute to addressing

the multifaceted challenges of the climate crisis. The literature review emphasized that addressing the climate crisis requires embracing diverse approaches beyond ecological concerns alone, as highlighted by Hulme (2009), and advocating for policy changes prioritizing environmental sustainability, as suggested by Klein (2014). Through prototyping and testing, the research aimed to raise awareness and stimulate introspection among individuals regarding their environmental perceptions and behaviors, rather than quantitatively measuring attitude shifts. The focus was on sparking curiosity and critical inquiry, aligning with Tsing's (2015) and Kirksey's (2015) emphasis on hope and renewal amidst disruption. By drawing on insights from the literature review and showcasing prototypes, the research contributed to fostering dialogue and informing public discourse on environmental issues, resonating with Tsing and Kirksey's optimistic perspectives on adaptation and resilience in uncertain landscapes. The example of the Broadleaf Plantain thriving in urban environments further underscored the resilience of species and possibilities for coexistence within altered ecosystems.

Adopting a research-creation methodology, as guided by Chapman & Sawchuk (2012), allowed for a holistic approach blending theoretical inquiry with creative practices, resulting in prototypes that effectively communicated complex socio-environmental narratives. Fieldwork and observations provided firsthand experiences of the environment, enriching understanding of human-nature interactions, with encounters like the bee sting incident prompting exploration into the medicinal uses of Broadleaf Plantain. This immersive approach fostered empathy and relationality, shaping the creation of prototypes. Visual documentation bridged academic discourse with personal experiences, grounding the research in lived realities. The literature review provided theoretical frameworks and historical context, while prototyping facilitated the translation of concepts into tangible artifacts,

enabling experiential learning and co-creation. Reflexivity played a crucial role, prompting continual critical reflection on assumptions, biases, and practices, particularly regarding cultural complexities and ethical considerations. Acknowledging positionality and remaining open to diverse perspectives, the research journey emphasized humility and reciprocity, striving to share acquired knowledge honestly while grappling with ethical dilemmas inherent in engaging with diverse knowledge systems.

6.2. Future Works

For future research, this study has laid the groundwork for investigating a specific plant, the Broadleaf Plantain, within the unique urban context of Toronto. This focus on a particular plant and location has shaped the scope of the research in relation to the choice of plant and the historical and socio-cultural context, providing valuable insights into interactions between nature and urban environments. Moving forward, it would be interesting to explore similar methodologies with other plants in various urban settings, allowing for comparisons and broader insights into urban ecology and human-plant relationships.

While acknowledging the limitations of this research, in future studies I would like to delve deeper into refining the practices that involve live plants. This also includes continuing to explore ethical considerations and finding ways to approach foreign epistemologies. By addressing these aspects, I can better navigate the complexities of engaging with diverse knowledge systems and cultural perspectives. Additionally, there is an opportunity to further explore the potential of different urban spaces in shaping human-plant interactions and environmental perceptions. By expanding the research to include a wider range of urban environments, I can uncover unique dynamics and challenges, contributing to a more comprehensive understanding of urban ecosystems.

The urgency of addressing the climate crisis serves as a compelling motivation to continue this line of inquiry. Given my interest in this area, I am particularly eager to delve deeper into discussions surrounding the affordances of undertaking such projects in today's world. The continuation of this work not only aligns with my personal interests but also presents an opportunity to make meaningful contributions to environmental scholarship and practice. By remaining actively involved in these discussions and endeavors, I aim to play a part in shaping a more sustainable and resilient future for urban communities and ecosystems alike.

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