

**Relating and Learning with Other Beings, Materials, and Weather:
Multispecies Assemblages at a Canadian Forest School**

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Abstract

In Canada, there has been a surge in outdoor and nature-based programming for young children, such as forest schools, with interest heightening over the COVID-19 pandemic. While there are many physical, cognitive, and emotional benefits associated with such outdoor programs, it is important to remember that humans are not alone in these outdoor spaces. Posthumanist, new materialist, and common worlds scholarship suggests broadening research to gain fuller, less anthropocentric, perspectives on child-nature relationships, including in educational settings. This multispecies ethnography of a forest school in Alberta, Canada had two primary research questions: How, if at all, do children empathize with the more-than-human world in a forest school setting? How might the forest school setting and pedagogy facilitate children's affective and embodied connections with the natural world?

Participants in the study included a group of six children and their educator as well as birds, dogs, grass, trees, weather, landscape, snow, and sticks. Using video footage collected through GoPro cameras worn by the children, photography, observations, interviewing, and local natural-cultural information, a variety of multispecies encounters were documented and analyzed. Several themes emerged: 1) Becoming-with animals; 2) Moving, learning, and interacting with trees and grass; 4) Experiencing weather, place, and landscape; and 5) Thinking with materials. Four additional research questions also emerged: Which non-human species or individuals presented themselves as research participants and partners in the research process? In what ways did materials, landscapes, and weather invite children's interactions/intra-actions? How did nonparticipant observation and sit spot observations contribute to decentering the children from the research process and what can be gleaned from this experience as a researcher?

How was the use of wearable cameras as a data collection method align with goals to respectfully bring in the children's perspectives and to gain insight into child-nature relations?

This study offers another window into the Canadian forest school experience, particularly as a novel study conducted in Alberta that takes a posthumanist, common worlds approach. It also illuminates the methodological potential of strategies such as sit spots and nonparticipation observation for decentring the human. Notable scholarly contributions include deepening our understanding of child-animal, child-weather, and child-snow relations, and offering insights into child-plant and child-outdoor materials relations, which have received little attention in common worlds research thus far. Practical suggestions also came out of this study including: integrating the more-than-human world into forest school practices more deeply and in an agentic way; attending to the more-than-human world in pedagogical documentation; and shifting language usage away from objectification of the more-than-human world to a language of animacy.

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Chapter 1: Introduction

Over the past few years, Canada has seen a surge in outdoor and nature-based programming for young children, such as forest schools. Throughout the COVID-19 pandemic specifically, outdoor learning garnered new attention (Gill, 2020), with parents and teachers turning to programs that are seen to offer children interesting learning experiences in a safer outdoor environment. In forest school programs, for example, children can climb trees, play with friends, observe local wildlife, share ideas, learn to use tools, or simply sit quietly, and research has demonstrated that a number of physical, cognitive, and emotional benefits are associated with these programs (Dabaja, 2021a). Although that is promising in terms of what forest school programs might mean for children's learning and development, I have come to believe, along with other researchers (e.g., Harwood et al., 2019; Mycock, 2019, Pacini-Ketchabaw & Taylor, 2015; Taylor, 2013), that it is also fruitful to look at children's forest school experience through another perspective – one that attends to child-nature relations.

At a forest school program, a group of young children spent regular and repeated time in an outdoor space guided by an educator and engaging in play and learning. This group of humans – both adult and child – enter into an existing community of animals, plants, bacteria, and fungi that live within the forces of weather, landscape, and human disturbances. The natural areas where these educational endeavours take place can be seen as “entangled natureculture spaces in which children, early childhood educators, and the forests themselves shape each other” (Pacini-Ketchabaw, 2013, p. 355). It is often in small moments that humans and non-humans interact, share experiences, learn from each other, and create new possibilities. Seemingly ordinary activities – where a child pretends to make cupcakes out of mud or lies down to watch tree leaves shimmering in sky, or when a chickadee lands on a branch above a child's

head and calls – can be powerful and worth examining from all angles, including those where the child is no longer the primary focus. Children’s relations to nature can be researched, then, through daily engagements and as mutually emerging (Rautio et al., 2017).

My study examines the affective, embodied, and empathetic aspect of children’s participation in a forest school program in Alberta, Canada. A multispecies ethnography was employed as the methodology with various data collection methods, yielding important insights into multispecies connections, local sociocultural histories, and the role of matter and weather in shaping the forest school experience. The findings contribute to a growing conversation on the co-flourishing (Haraway, 2008b) of humans and our relations in our common worlds. This first chapter outlines the purpose of my study and my research questions. It also describes the study’s rationale and my position as the researcher.

Purpose and Research Questions

The purpose of my doctoral study was to examine children’s experience of empathy for the more-than-human world while they attended a forest school program. I sought to better understand child-nature relations and to put into practice the concept of decentering the human during research (Pacini-Ketchabaw et al., 2016), in line with posthumanist and common worlds theories that suggests a researcher focus on relations beyond children and adults, indeed any human research participants, to be inclusive of other beings. Research participants in my study thus included humans as well as other beings, elements, and objects.

Young children learn in a holistic way while engaging their senses and using their bodies. In an outdoor setting, this is particularly apparent given the numerous opportunities offered to children in terms of movement and the sensorial stimulation of being outside amongst other living beings and exposed to all weather. Thus, I also wondered how the forest school education

approach itself might facilitate child-nature encounters that contribute to positive multispecies relations. Two questions guided my research:

- 1) How, if at all, do children empathize with the more-than-human world in a forest school setting?
- 2) How might the forest school setting and pedagogy facilitate children's affective and embodied connections with the natural world?

Following data collection, I also formulated additional questions that helped frame my analysis and reflections:

- 1) Which non-human species or individuals presented themselves as research participants and partners in the research process?
- 2) In what ways did materials, landscapes, and weather invite children's interactions/intra-actions?
- 3) How did nonparticipant observation and sit spot observations contribute to my goal of decentering the children from the research process and what can be gleaned from this experience as a researcher?
- 4) How did the use of wearable cameras as a data collection method align with goals to respectfully bring in the children's perspective and to gain insight into child-nature relations?

Rationale

This study is inspired by my interest in contributing to the growing body of literature that delves into human-nature experiences in this age of intense and rapid human-induced environmental change that has been called the Anthropocene (Mycock, 2019; Steffen et al., 2007). My professional experience in and knowledge of child development and early childhood

education has shaped my particular interest in examining the experience of young humans, and my personal values inspire me to strive for a better understanding of how we might live more sustainably and ethically in this world.

Around the world, there is a growing interest in nature-based programs for children (Knight, 2013b), paralleled by an increase in research on various programs and approaches aiming to provide meaningful experiences with nature¹ for children, as well as on the roles and perspectives of young children on matters of sustainability (Elliott et al., 2020; Engdahl, 2015; Somerville & Williams, 2015). Here in Canada, nature-based outdoor education for young children is certainly on the rise (Boileau & Dabaja, 2020). A recent Canadian survey study estimated that between 40 000 and 60 000 children attended outdoor nature-based programs in the 2018-2019 school year (Harwood, Boileau, et al., 2020) and anecdotally, there has been growing interest in these programs since the beginning of the pandemic in March 2020. For example, in response to demand, the forest school site where my study was conducted expanded with new groups in winter 2021.

Creating space for children to develop a deep connection to a specific patch of nature – whether it be a largely untouched forest, a small urban park, or a childcare centre yard – and to engage in meaningful learning with their bodies can allow for learning encounters with other children, educators, various other living beings, and nonliving elements such as play materials, precipitation, and landscapes as well as garbage, built structures, and manufactured objects. Such encounters can impact children’s connection to nature (Barrable, 2019), their sense of place (Cumming & Nash, 2015), their environmental consciousness (Jørgensen, 2016), and their self-

¹ I define “nature” as the biophysical environment, which includes all life forms, minerals, natural processes, landforms, and weather forces. I do not subscribe to the nature-culture dichotomy that is prevalent in Western culture, thus I consider humans to be a part of nature.

confidence and social skills (Murray & O'Brien, 2005). Children learn through their senses and their bodies in outdoor contexts. As Sanderud (2020) writes, children's

experiences in and of the world, including with nature, are crucial to their being and the production of meaningful relationships with their environment...the process of meaning-making occurs as the child moves through the landscape; the child learns where to go and what to do as she or he becomes a wayfarer in the outdoors. (p. 113)

Historically, much of the research pertaining to early childhood has been grounded in child development theory and child psychology, which has been critiqued as anthropocentric. For example, Taylor et al. (2012) argue that using that lens alone is a "grossly inadequate conceptual framework for responding to the challenges of growing up in an increasingly complex, mixed-up, boundary blurring, heterogeneous, interdependent and ethically confronting world" (p. 81). In a more recent example, Land et al. (2020) argue for a complete dismantling of the anthropocentric ontology that guides early childhood education in Canada, given its limitations in terms of relating to the world. There is an urgent call to "reconfigure the relational commons of early childhood education as we work to respond ... to the complexities of childhoods and of education in 21st-century Canada" (p. 10).

Many researchers have thus turned to scholarship in posthumanism, ecofeminism, multispecies relations, new materialism, and Indigenous perspectives to broaden their horizons (e.g., Kraftl et al., 2020; Nxumalo, 2019; Weldemarian, 2017). An example of an approach that builds on this diverse scholarship has been dubbed "common worlds" (Taylor, 2013), which acknowledges the messy, entangled, and culturally and historically situated relationships among humans and nonhuman others. Attending to the shared worlds of humans, forces, objects, places,

and histories opens up a new path towards understanding lived experiences through a relational and ethical lens. Common worlds research has been conducted in Canada in recent years, often with a focus on early childhood (e.g., Haro Woods et al., 2018; Harwood et al., 2019; Harwood & Collier, 2017; Pacini-Ketchabaw, 2013). I will describe this theoretical lens at the beginning of the literature review section.

Recently, there also has been a call for more research attention to the emotional dimensions of environmental education (Russell & Oakley, 2016). Early affective attachments to nature have been touted as important by researchers, including Sobel (1996) whose early place-based educational model begins with an emphasis on empathy in the early years as a precursor to later environmental action. Attending to the emotional side of human-nature relations could be crucial in understanding how children relate to nature, including if this has any bearing on their attitudes towards conservation, sustainability, and respect for the more-than-human world. As Barrable (2019) writes, research on the affective aspect of child-nature relations could “provide valuable evidence with which to build a basis for pedagogical practice in early childhood settings around the world” (p. 65).

As noted above, one pedagogical practice that is rapidly gaining popularity in Canada is the forest school model, whereby children spend extended amounts of time in an outdoor learning environment, playing and exploring, and ideally developing a sense of place and building sense of self, social skills, and knowledge of natural history. This approach has personally interested me for many years, and I have closely followed the growth of this movement in Canada, from watching the creation of the Forest School Canada organization (part of the Child and Nature Alliance of Canada) to taking the Forest and Nature School Practitioner course myself. I have seen firsthand the value of this approach and it is clear, through the growth

in program offerings and wait lists, that many Canadian parents are also interested in enrolling their children in these outdoor programs. As a researcher, I also believe in investigating, documenting, and critiquing this educational phenomenon to enhance our understanding, to inform and inspire researchers and practitioners around the world about how forest school is playing out in Canada, and to identify what is and is not working well so as to improve both theory and practice.

Finally, this study addresses several identified gaps in the literature (which I will discuss more fully in the literature review). For example, although a few studies have been conducted with the common worlds framework in Canada and elsewhere (see <https://commonworlds.net/resources/> for a list of publications), as far as I know none have been conducted in Alberta, where I was situated when conducting my research. Canada is a huge and diverse country with regional subcultures and it is important to examine different contexts in order to work toward a more complete picture of child-nature relations and forest school experiences. Research on forest school pedagogy in Canada is still limited and has mainly been conducted in Ontario and British Columbia despite the fact that there are many forest school programs offered across the country (see <https://www.ourkids.net/school/forest-schools>). Other important gaps in the literature include a lack of studies on outdoor education for children that meaningfully includes the more-than-human world as more than a backdrop, and studies that specifically investigate empathy. There also remain many tensions and complexities within nature-based early childhood education in Canada that merit further examination and theoretical grounding, such as inclusion of Indigenous local knowledge and practices and environmental sustainability goals as well as what spaces are best suited to nature-based early learning.

Researcher Positioning

To provide some personal context, in this section I reflect on my positioning as a researcher. Tilley (2016) suggests some questions that can guide thinking in this respect, which I found helpful:

Who are they [the researchers] in relation to the individuals who will participate in their research? How do their multiple, shifting and socially constructed identities intersect with those of their participants or communities? What are their connections to the research context (if any) and how might these connections influence their research? (p. 30)

I grew up in Gatineau, Quebec, in an upper middle-class nuclear family of five. I am a white cis-gender female doing her PhD, having had many fortunate opportunities throughout my life. When I examine pictures of my childhood, I see many connections to and entanglements with the sociocultural setting and the more-than-human world in which I was situated. The moments captured of my childhood in my Gatineau home, a home in which my parents still reside (see Figure 1), remind me of summer days gardening in the yard, winter days playing in the high snowbanks, even laughing when my father playfully angled the snowblower on me as he cleared the driveway. Spending time at the kitchen window observing birds at our feeder and birdbath, taking compost out to our backyard compost pile, and picking rhubarb from the yard for baking with were all common experiences that connected me to that place, to the living creatures with whom I shared the space, and to weather.

Figure 1

Childhood experiences in Gatineau



I also spent my childhood summers at a family cottage on Lake Muskoka in Ontario, a place to which I developed a strong attachment. This sense of rootedness in a beautiful natural place away from city life, a personally significant place associated with many happy memories, is an example of a formative childhood experience that can lead to environmental commitment later in life (Chawla, 1998). Looking at the photograph in Figure 2 takes me back to the smell of pine needles in the sun, the feeling of walking on crunchy lichen growing on bare rock, the sound of waves splashing on the dock and rocks, and the sound of birds and squirrels going about their lives in this shared place. I certainly acknowledge the privileged experience I had in this beautiful natural space, and that this privilege may have come at the expense of Indigenous Peoples who inhabited or roamed through this land at the time it was purchased by my ancestors in 1885, when it was deemed to be Crown land. My formative years were thus entangled in complex ways with histories, culture, family, values, countless individuals of other species, and with the places themselves.

Figure 2

Connecting to the land in Muskoka



In light of urgent calls for environmental action such as the need to drastically reduce global greenhouse gas emissions (IPCC, 2018), I believe that it is crucial to research environmental education initiatives with the hope of improving practices that can help move us towards a sustainable future. As Beery and Jørgensen (2018) write, the increasing rate of biodiversity loss and lack of research “creates a sense of urgency and a heightened significance for the work of educators” (p. 15). Given that early life experiences can shape children’s lifelong health, values, and behaviours, “early childhood environmental education has the potential to make a significant impact on the development of young children and a significant contribution to a sustainable society” (Ernst, 2014, p. 748).

I am an environmentalist, an early childhood educator, an environmental educator, and a college instructor as well as a researcher. I completed a Master’s degree in environmental education and communication from Royal Roads University, during which I conducted research with preschool children experiencing nature-focussed educational programming. I also am an

early childhood education professional and completed a certificate in this field. I have worked in various capacities with young children and currently teach early childhood education courses at the post-secondary level; I therefore have a solid grounding in play-based learning and child development, including social-emotional development of young children. I also recently completed the Forest and Nature School Practitioner course offered by the Child and Nature Alliance of Canada.

My background and identity have impacted this research process in several notable ways. Because I am a proponent of the forest school model, I realize that this influenced my outlook when conducting research. Given the many positive memories I myself have of playing outside as a child and having worked in conventional daycare buildings where children had little access to the natural world and seemed confined to small, enclosed, and often noisy indoor spaces or artificial and overprotected outdoor yards, I feel happy when I see young children who are given the freedom to get muddy, build dens, climb trees, get a mental health break, and play in the sun with friends. I knew that I could not be objective in this study given my inclinations; however, I also remained open to possibilities, including critiques of the forest school approach.

In relation to the research participants and community, I was mainly an observer, and occasionally acted in teacher-like ways when I was with the forest school group. My age created a natural difference between the participating children and myself. I had an existing relationship with Jackie², the educator in the study, since I had worked and volunteered alongside her in the past as part of my forest and nature school practitioner training. Other research participants in this study were non-human. These included other living animals and plants as well as elements of landscape, weather, and inanimate objects such as rocks, play materials (e.g., books, rope,

² All human participants in my study have been given pseudonyms.

craft supplies, etc.), and even garbage on the site. These all are considered part of the more-than-human world and through a posthuman lens, are seen to have value and even agency of their own that can affect other beings and objects through their forces, movements, properties, and chemical exchanges (Hodgins, 2015; Pacini-Ketchabaw & Boucher, 2019; Rooney, 2018, 2019). In relation to these participants, my humanness meant a great deal of difference and thus created a challenge in capturing their voices, which will be discussed in later sections. While I am limited by my human senses, I do have a deep respect for and awareness of the intricacies of the natural world, from the smallest creatures to the systematic processes of ecosystems, and I have honed my observation skills through working as an environmental educator in several places such as the Montreal Insectarium, the St Lawrence River Institute for Environmental Sciences, the University of Guelph Arboretum, and the Petrie Island Nature Centre in Ottawa.

Finally, I want to note my position as a settler colonial descendent conducting research on what was traditionally the land of several Indigenous nations and is now identified as Treaty 7 territory. Harwood, Whitty, et al. (2020) write that, “Indigenous peoples and knowledge systems offer powerful counter-narratives to human–nature divides, human exceptionalism, and colonial hegemonic discourses that currently influence early childhood education for sustainability research and practices” (p. 25). Although I am not Indigenous nor have I been raised to understand Indigenous ways of knowing and being, I endeavour to be respectful and curious, to research and gain knowledge about the Peoples who once inhabited and lived on this land and who continue to do so, and to take into account the rich natural-cultural history of the research site.

In the next chapter, I will turn the reader’s attention to a thorough review of the body of literature that has informed my research. Subsequent chapters will describe the methodological

process I employed to explore my research questions, after which I will discuss my findings, which are separated into four chapters. I will end the dissertation with a chapter that encapsulates further reflections on my study as a whole, implications of my findings, and directions for future research.

Chapter 2: Literature Review

To recap, my research questions are: How, if at all, do children empathize with the more-than-human world in a forest school setting? How might the forest school setting and pedagogy facilitate children's affective and embodied connections with the natural world? Reading and analyzing relevant literature helped me arrive at these questions and has informed all aspects of this study.

To begin, I discuss the theoretical framework guiding this research. I then provide an overview of the field of early childhood environmental education and the children and nature movement. I move on to discuss the Canadian context of this research and the Indigenous perspectives that I seek to incorporate. Theoretical influences of nature-based pedagogy are then outlined before I turn to the specifics of forest school, describing its history and pedagogy. I also provide a thorough account of research that has been conducted on forest school programs and list the main critiques that have been raised as this pedagogy becomes popularized. Since children interact with many living beings during play at forest school and are learning through a place-based approach, I also discuss these topics. Finally, I provide an overview of literature on empathy as discussed in environmental education and early childhood contexts.

Theoretical Framework

In this section, I describe the theoretical framework that guided this research. To begin, I heed the words of Wilson (2019) who writes, "If there's a re-set button, it's time to press it now. As a culture, we need to self-correct. Hopefully, we still have time. Thinking deeply about post-humanism may help us through this process" (p. 27). This statement set the tone for my research, as I was guided by a sense of urgency as well as a curiosity about what new perspectives like posthumanism have to offer.

First, what is posthumanism? Finding a common definition is challenging since various authors describe it in different ways (Ulmer, 2017). A driving notion, however, is the recognition that “given the state of the planet, human-centered approaches to research may not be enough” (Ulmer, 2017, p. 833). Posthumanism therefore offers a way to move beyond the human experience to acknowledge diverse ways of knowing and being in the world and “aims to de-centre our ways of thinking about human and non-human interrelationships, with ‘common worlds’ approaches being seen as collective and relational for all the Earth’s species and non-living entities, such as water, air and landscapes” (Elliott, 2019, p. 24). This emphasis on interconnectedness and relationality echoes feminist thinking (Ulmer, 2017), which makes sense given an important strand of posthumanism is greatly informed by feminist scholarship such as work by Haraway (2008b; 2016) and Tsing (2015). Indeed, Braidotti (2022) argues in her book, *Posthuman Feminism*, that feminism was a precursor to the posthuman turn. There is much common ground in posthumanist and contemporary feminist research, particularly new materialist feminist and ecofeminist scholarship that views all matter as “vibrant and agentic actants entangled and embedded within the more-than-human networks” (Harwood, in press, p. 8).

The call to move beyond humanism has been made in many disciplines, including education (e.g., Bell & Russell, 2000; Snaza et al, 2014). Barratt Hacking et al. (2013) observed how the development of child-centered pedagogies and research methods where children are the focus rests on humanist assumptions. Posthumanism may be a particularly effective counterbalance to the pervasive belief in “pure” childhood and “pure” nature that informs the popular movement to reconnect children with nature (Louv, 2008). Indeed, Duhn et al. (2017) argue that humanism has been ineffective in adequately portraying childhood in all its

complexities, including how it is intertwined with nature not only in wilderness or rural environments but also in urban environments. Duhn et al. (2017) argue for a troubling of the meaning of both childhood and nature in order to “go beyond humanist ontologies that assume humans are exempt from the ecology of the planet” (p. 1366). Somerville (2020) suggests children today might be thought of as “children of the Anthropocene” (p. 104), given that they are growing up in a radically different environment than what contemporary adults have experienced due to the catastrophic impact of climate change and habitat destruction. Indeed, children might even be seen as geological agents in this new age of anthropogenic changes to the Earth (Kraftl et al, 2020). Different times call for a different approach to researching children and nature.

There are a few key theorists whose work has particularly inspired educational researchers’ turn to posthumanism, such as Haraway (2016) and Latour (2007). Haraway (2008b; 2016) has arguably been most impactful on environmental education researchers, including those using the common worlds framework. Haraway addresses the complexities of the world we live in by encouraging humans to, in these precarious times, stick with discomfort and to accept, examine, and learn from the situations we find ourselves in, that is, to “stay with the naturalcultural multispecies trouble on earth” (2016, p. 40). Flourishing, or living well, in this world is possible, she argues, but “only in multispecies alliances, across the killing divisions of nature, culture, and technology and of organism, language, and machine” (2016, pp. 117-118). Haraway’s work is also foundational to posthumanist and feminist perspectives on human-animal relations (Lloro-Bidart, 2017), and her ideas have been taken up by numerous environmental educators with interest in the “animal turn” (see Fawcett, 2013). Indeed, many other authors agree that the time is ripe for recognition of other animals and the rest of life as

complex living beings rather than passive objects of study (e.g., Bell & Russell, 2000; Fawcett, 2013; Lloro-Bidart, 2017; Russell, 2005; Russell & Spanring, 2019; Warkentin, 2010).

Haraway (2008a; 2008b; 2016) also has contributed greatly to common worlds theorizing and is often cited in posthumanist research related to child-nature relations (e.g., Kopnina et al., 2020; Nxumalo & Pacini-Ketchabaw, 2017; Somerville, 2020). Latour (2007) coined the term “common world” when arguing that the social sciences need serious rethinking since it is not possible to study *only* human society because it is not a separate domain. Describing the social as “a very peculiar movement of re-association and reassembling” (p. 7), he argues that while the social sciences may not have traditionally included nonhuman beings,

no science of the social can even begin if the question of who and what participates in the action is not first of all thoroughly explored, even though it might mean letting elements in which, for lack of a better term, we would call *non-humans*. (p. 72, emphasis in original)

In recognition of this, he suggests replacing the word “society” with the word “collective” because it better connotes actions and effects of the material world.

The ideas of Haraway and Latour, among others, have greatly influenced the recently developed common worlds research framework. For example, Taylor (2013) outlines in her book, *Reconfiguring the Natures of Childhood* the theoretical grounding for common worlds research with children, citing both Haraway and Latour often. She picks up on Latour’s proposal to speak of common worlds instead of nature and society as distinct categories. Such a shift “takes us well beyond thinking about the individual human exercising agency on a passive or inert nature, including the scientist studying nature, the educator teaching students about nature, and the individual child playing with natural materials” (p. 69). Taylor finds Haraway’s idea of

staying with the trouble “simultaneously playful, ethical, political and hopeful” (p. 83) and a welcome alternative to the romanticized, overly sentimental idea of children in nature that is common in nature-based early childhood education scholarship and practice.

Wilson (2019) writes, “to properly define humans’ place in the universe we need to listen to multiple voices and consider different perspectives” (p. 27). According to Ulmer (2017), posthumanist research practices, particularly those inspired by Haraway’s (1988) early work on situated knowledges and partial perspectives, has much to offer. It must be said, however, that the call to bring in and listen to diverse voices, including non-Western perspectives and the more-than-human world, is not a new idea in environmental education. A number of environmental education research scholars were making this argument twenty or more years ago (e.g., Bell & Russell, 2000; Corcoran & Sievers, 1994; Fawcett, 2000; Lewis & James, 1995; Russell & Bell, 1996) even if that work was marginalized in the field until recently (see Fawcett, 2013; Gough, 2013; Shava, 2013).

These ideas have been increasingly discussed in early childhood environmental education. The *International Journal of Early Childhood Environmental Education*, for example, published a special issue entitled “Living within Precarious Times: Posthumanist Possibilities for Early Childhood Environmental Education” (Dernikos & Bhagwanji, 2019) that offers several examples of how posthumanist research is being applied in the field. I agree with many of the researchers cited above that taking this approach is crucial both to the future of the planet and for the holistic development of children (Wilson, 2019).

New materialism is a theoretical approach that has arisen in tandem with posthumanism. As Sanzo (2018) explains, new materialism overlaps with posthumanism in its rejection of

anthropocentrism and although there are various branches of new materialist theories, they all “embrace the vitality of matter” (para. 8). Somerville (2020) states that through new materialism:

... the way is opened for the materiality of sand, stones, things, and children in play... to generate new ways of thinking and being where the world becomes present in all of its vibrant vitality rather than reduced to the dull and abstract forms of universal generalizations more typical of Western knowledge theorizing. (p. 114)

As such, researchers can recognize objects not as mere background or simple props but as prominent agents operating within a relational encounter.

Barad (2007; 2008) is a scholar who has inspired new materialist research, and she has grappled with what it means to think beyond the human. In her writing on posthuman performativity, she argues for an “accounting of ‘nonhuman’ as well as ‘human’ forms of agency” (Barad, 2008, p. 129), suggesting that matter is not merely a substance but is constantly intra-acting, shifting, becoming, and thus an ongoing materialization. Items such as sticks, pinecones, soil, or snow have their own agency and “the world is an ongoing open process of mattering through which ‘mattering’ itself acquires meaning and form in the realization of different agential possibilities” (Barad, 2008, p. 135). In this sense, nature is not merely a background for human endeavours, but is an active force unto itself.

Many researchers in the field of early childhood education have started to apply new materialist ideas to their work (e.g., Hackett & Somerville, 2017; Harwood & Collier, 2017; Holmes et al., 2020; Merewether, 2019; Pacini-Ketchabaw et al., 2017; Somerville, 2020). Ulmer (2017) has noted the uptake in “thinking with” objects, things, technologies, other animals, rocks, stones, or water in this research, which has guided my own approach to data analysis.

In the last few years, there has been a marked increase in publications using a common worlds framework (e.g., Blaise & Hamm, 2019; Hodgins, 2019; Rooney, 2018; Taylor, 2017; Taylor & Pacini-Ketchabaw, 2015). The Common Worlds Research Collective (<http://commonworlds.net/>) now includes about 80 researchers from around the world (including myself), indicating the growing interest in this new approach to research. Common worlds research attempts to move beyond exclusively human-based pedagogical interests, instead assuming humans are entangled in complex ways with the being and becoming of other species (Nelson et al., 2018). The common worlds view of childhood is as a “situated, collective, and relational rather than as a universal developmental life stage that is experienced individually” (Nelson et al., 2018, p. 8).

One example of common worlds research is by Rautio and her team (2017) who conducted research to explore children’s intra-actions with matter in an urban childcare program in Finland, focusing on what they termed “child-within-nature events” (p. 1381). The first story, one described as “interdependence gone wrong,” related to an encounter with a gull at a landfill site and a child recalling his father’s negative comments about these birds and how they should be shot. The second story is about the researcher and children going inside a grocery shop for a few minutes to warm up, which the researchers included because they understood that moment not as a break from the children’s engagement with nature, but as a relevant part of urban children’s broader engagement with nature and the world they live in. Their study illuminated the complex worlds children and their teachers, human and more-than-human, inhabit.

Pacini-Ketchabaw (2013) articulates the importance of acknowledging the “friction” that can result in conducting common worlds research, and she has found the ideas of Tsing (2005, 2015) helpful in that regard. In discussing her weekly visits to a forest in British Columbia with a

childcare centre, she makes it clear that “forest pedagogies are not as simple as taking children for a walk in the forest and learning about the species that live there” (p. 356). For Pacini-Ketchabaw (2013), forest knowledge and an understanding of place must include a history of that land, which in Canada must acknowledge Indigenous history and colonialism. Further, the forest is viewed as an “active collaborator” in pedagogy and figuring out how forest pedagogy can respond to stories that the forest knows is “paramount just now, at a time of global surprise about the losses the world has suffered in the name of human progress (i.e. colonialism), a time of widespread human disregard for our interdependence with other species” (p. 358). Pacini-Ketchabaw therefore suggests cultivating “thinking with forests” (p. 358).

Such attention to the more-than-human and rejection of human exceptionalism is fundamental to posthuman research (Bennett, 2019). It is vital to acknowledge that a multitude of other beings have agency in the world (Pacini-Ketchabaw et al., 2016). Posthuman research approaches thus seek to recognize that things are not static, rather “they change (or become) as they merge with other beings or influences” (Powell & Somerville, 2018, p. 3).

Decentering the human is challenging when research is conducted in a traditionally humanist field like education (Russell, 2005; Taylor & Pacini-Ketchabaw, 2015). That may be particularly so in early childhood studies; as Nelson (2020) writes, “while it may be easy to agree conceptually on this point, it can be difficult to do so in the context of childhood practices founded on developmental, humancentric, and heavily romanticized early childhood narratives” (p. 642). Pacini-Ketchabaw et al. (2016) write about their own experiences attempting to shift their research perspective from a child-centered view to a multispecies view and enumerate some of the challenges they encountered:

... from strongly held early childhood research practices (following the child, representing other as the objects of study, making meaning, focussing on innocent encounters, safety of thinking as an individual researcher) toward research practices within common worlds of human and nonhuman constituents, all exercising agency (following multispecies relations, engaging with more-than-human others as active research subjects, learning to being affected as researcher, attending to awkward encounters, risking thinking collectively). (p. 152)

While it is obviously challenging to decenter the human, doing so could be a powerful tool for changing perspectives and rethinking how humans experience the world, expanding our understanding of relations with the multitude of other species, elements, and spaces that coinhabit the world (Born, 2019), which ultimately could “transform practice, thinking, and relating to and within the environment” (Born, 2019, p. 13). Ogden et al. (2013) argue that this work is worth pursuing and that there is much to learn about the world when we shift our research focus and try new ways to study multispecies encounters.

Shifting the focus away from humans begs the question of who we might then include in our research. Russell (2005) asks who “draws our attention and is worthy of representation” (p. 436) in posthumanist environmental education. She wonders whether charismatic megafauna will dominate or whether less attractive or “pest” species or plants might be included? She also wonders about the inanimate. As Bennett (2019) asserts, “things” don’t get much attention in social science research given its “preoccupation with language, identity and human-to-human power relations” (p. 58) and she observes that there is really no methodological road map for looking beyond the human.

Posthumanism, new materialist, and common worlds ideas, particularly as they have been taken up by education researchers, have guided each step of my research process, from including sections that counter the anthropocentric norm within my review of literature, to planning how to collect data in a way that would not solely focus on children, to representing findings that provoke the reader to consider relations rather than individual children and their learning. Now that I have provided an introduction to my theoretical framework, I turn to a review of relevant literature that pertains to my research questions. I begin by discussing the field of early childhood environmental education before moving to forest school pedagogy and research, then various aspects of child-nature relations, and finally empathy.

Child-Nature-Education-Sustainability Assemblages

My research is situated within the field of early childhood environmental education (ECEE)/early childhood education for sustainability (ECEfS). In this section, I will tease out how these two different names for similar fields have arisen and how they differ. What became clear as I reviewed the literature is that education about/with/for nature and sustainability can be performed with various goals in mind, including an anthropocentric goal that focuses on benefits for children's healthy development or an ecocentric approach that focuses on the health and wellbeing of an environment of which humans are but a part.

First, I begin this review of the literature section with an overview of early theorists who were formative influencers in the area of ECEE/ECEfS. Popular authors such as Louv (2008) have also been influential in leading the recent "back to nature" movement, but in the last few years, there has been increasing critique of some of the underlying assumptions of this approach to outdoor education, which I will discuss. Since a comprehensive overview of environmental education and early childhood education as separate fields would be too onerous in this review, I

hone in on early childhood environmental education practice and research, mostly in a North American context and from a Western perspective given that it is the dominant discourse in Canada.

Historical Influences

Wanting to provide young children with opportunities to learn in and with nature is not only a contemporary desire. Many early childhood environmental education practitioner guides cite childhood theorists from the first half of the 20th century such as Steiner, Dewey, the McMillan sisters, Montessori, and Piaget. Earlier theorists like Rousseau and Froebel also have been significant influences on the movement even if they are not always recognized as such by today's forest school practitioners. I will describe the work of each in roughly chronological order.

Rousseau (1964) was a French philosopher of the 18th century who understood children to be pure, innocent, and vulnerable. One of his main ideas was that children are corrupted by adults, so the most effective education for young children is for them to learn directly from nature, which was also depicted in pure and romantic ways. Rousseau's writing still shapes early childhood environmental practice today as demonstrated by the romanticism infused throughout the children and nature movement such as in the popular work of Louv (2008). Taylor (2013) spends half of her book, *Reconfiguring the Natures of Childhood*, deconstructing Rousseau's romantic notion of "Nature's Child" and the problematic child-nature binary relationship it sets up.

Much like Rousseau, Froebel (1782-1852), who first developed the kindergarten model in 1837 in Germany, believed that children are inherently good. His kindergarten system was based on providing "gifts" to children that were materials with interesting properties from which

children could learn in a sequential manner (Knight, 2013a). Froebel's early childhood pedagogy was in fact a nature-based pedagogy, and he was inspired by Rousseau's romantic notion that children learn best directly from nature and also by the idea that the younger children are, the closer is their relationship to the natural world. Nature was the central organizing concept for him, and this was embodied in his design of garden plots that were to be constructed in kindergartens in a very particular way. After his death, Froebel's ideas were brought abroad, including to Canada, and form the basis of today's kindergarten model (Prochner, 2009).

Steiner (1996), who was working in Austria, centered his educational philosophy around the interconnection between children, nature, and spirituality. Waldorf Schools, based on Steiner's approach, are today found around the world. Waldorf teachers integrate the arts (music, dance, theatre, literature, etc.) into the curriculum and view them as topics to be experienced rather than tested on. They also view each child as unique and strive to develop in each a lifelong love of learning (Waldorf Education, 2019). Steiner "encouraged independence, creativity and self-led play in an environment that also enabled some risk taking and opportunities to develop perseverance" (Constable, 2014, p. 6), which are notions echoed today in forest school pedagogy.

Dewey (2001), an American educator and philosopher, proposed that children's learning should be experiential and that educators should build on children's interests to optimize learning. Dewey's vision that it is crucial for children to be presented with appropriate challenges to develop their problem-solving skills, and that they learn best through firsthand experience, has been foundational to the outdoor education field in general (Brendtro & Strother, 2007). While others expanded upon and adapted Dewey's ideas about experiential learning in the intervening years, there also has been a return to his original theory as a guide to modern

practices in outdoor education (Ord & Leather, 2011). As Williams-Sieghfredsen (2017) explains, Dewey's theory supports the idea that "children are interested in experiments, trial and error, and representing what they are learning through construction and play" (p. 20). Inquiry-based, emergent, and experiential learning are fundamental concepts in the Canadian forest school guiding principles (Forest School Canada, 2014).

In 1914, the McMillan sisters opened the first open-air nursery in London, England. Inspired by both Froebel and Dewey, they believed in the importance of fresh air, exercise, whole foods, and bathing for the well-being of children (Dietze & Kashin, 2019). They gardened with the children and "arranged space for children to play on climbing equipment, in sandpits and on the 'heap,' where they could explore natural and manufactured objects" (Dietze & Kashin, 2019, p. 42). Their commitment to outdoor learning and their use of both natural objects and tools also resonates with contemporary forest school practices.

Montessori was an Italian educator who worked with children in the slums of Italy at the turn of the 20th century. These children were thought to be under-stimulated and have cognitive delays. She developed a set of tasks with specific child-sized materials that were meant to be used repeatedly, which she argued would help children develop their sense of accomplishment. Today, Montessori preschools and centres are found all over the world and most North American parents are at least somewhat familiar with the pedagogy. Knight (2013a) describes the various links between the Montessori approach and forest school – notably the use of natural materials, the understanding that children need repeated experiences to learn, and the importance of outdoor sensory play.

Piaget (2007), an early 20th century Swiss psychologist, contributed greatly to research on children's cognitive development. He believed that "learning repeatedly helps children to

assimilate their learning” (Constable, 2014, p. 10) and that children construct their own knowledge. Further, he observed how children learn through mental schemas and repeating behaviours. These ideas have also been taken up by forest school educators; for example, Constable (2014) recommended forest school teachers observe and monitor children for certain patterns and plan experiences to further their cognitive development. Piaget also put forth the notion of disequilibrium, arguing that it leads to cognitive development: “The disequilibrium state is not a comfortable one. Thus, according to Piaget, disequilibrium sets into motion the child’s construction of knowledge” (Kahn & Weiss, 2017, p. 16).

In the interest of keeping this section succinct, I have selected the above early theorists because they are the most often cited in forest school or other nature-based education publications, but it is by no means an exhaustive list. It is important to note that there are others who have also influenced this field, some of whom will be mentioned in subsequent sections. I now provide a brief account of practice and research in early childhood environmental education/early childhood education for sustainability, to situate my own study.

Early Childhood Environmental Education and Early Childhood Education for Sustainability

One of the first publications that I read that specifically discussed children’s connections to nature and the environment was Ruth Wilson’s *Environmental Education at the Early Childhood Level* (1994), which was when I was first introduced to the field of early childhood environmental education (ECEE), which has North American roots. In 2010, the North American Association for Environmental Education [NAAEE] published *Early Childhood Environmental Education Programs: Guidelines for Excellence*. In the document, NAAEE defines early childhood environmental education as:

... a holistic concept that encompasses knowledge of the natural world as well as emotions, dispositions, and skills... [It] includes the development of a sense of wonder; appreciation for the beauty and mystery of the natural world; opportunities to experience the joy of closeness to nature; and respect for other creatures. It also includes the development of problem-solving skills and the development of interest and appreciation in the world around us. These goals acknowledge that learning is more than a cognitive process and that emotions play a particularly important role. (NAAEE, 2010, p. 2)

In 2013, the *International Journal for Early Childhood Environmental Education* was established, which is hosted by the Natural Start Alliance, a division of the NAAEE, therefore also hailing from a North American context. Key American researchers have been foundational to the development of the ECEE field, such as Wilson (1994, 2008, 2019). Ardoin and Bowers (2020) recently conducted a systematic review of the literature in ECEE. They examined 66 articles published between 1995 and 2018 that presented empirical information on educational programs for young children (up to age eight). Given the use of the terms “early childhood” and “environmental education” in the search, it is not surprising that North American was most heavily represented in the resulting publications, although there were studies from Europe, Australia and New Zealand, and Asia in smaller numbers as well. The majority of studies were published between 2013 and 2018, and the earliest was published in 2000, attesting to the relative newness of the field and recent expansion of research in this area. Two of the unifying practices within ECEE were found to be *time in nature* and *action taking* (such as gardening and recycling). They also reported that ECEE practices generally included a

... range of outcomes designed to nurture children's development of action skills and encourage developmentally appropriate pro-environmental behaviors. In addition to an environmental focus, the reviewed studies indicate that ECEE programs emphasize related early childhood goals of personal development as well as academic progress (e.g., in the form of kindergarten readiness). (Ardoin & Bowers, 2020, p. 13)

In parallel to the field of ECEE, early childhood education for sustainability (ECEfS) has also emerged as a similar, yet distinct, field of study, hailing largely from Australia and Europe, led by researchers such as Elliott, Ärlemalm-Hagsér, and Davis (Elliott et al., 2020). The notable difference from ECEE is that ECEfS is that it is based upon principles of education for sustainable development (Ärlemalm-Hagsér & Elliott, 2017). This field arose from a desire to question “dominant economic and political thinking, promoting the three pillars of sustainability, and investigat[e] the challenges of globalisation” (Ärlemalm-Hagsér & Elliott, 2017, p. 267). In 2009, Davis published a literature review of the research in ECEfS and concluded that:

... teaching and learning (and research) for the very youngest of children that seeks to address increasing alienation from nature and that builds their capabilities as active, engaged young citizens has, until recently, been “missing in action” despite the social, health, economic and educational benefits. (p. 228)

Both the practice of and research in this field has grown considerably since Davis' review; a subsequent literature review by Somerville and Williams (2015) found that there was at least a doubling of research articles published in the same journals that Davis had surveyed six years earlier. Somerville and Williams discuss the three main theoretical frames now informing research in the field of early childhood education for sustainability: childhood connection to nature; human/children's rights; and posthumanism. The studies informed by the connection to

nature discourse “represent a continuing tradition of environmental education in which the fundamental aim is to connect children to the natural world, to teach them about its values and to act for its conservation” (p. 109). Studies informed by human/children’s rights discourse build on the idea that children have a right to participate in sustainability issues that affect their life. Studies informed by posthumanist discourse focus on “the need to move beyond the nature/culture binary in early childhood education research” (p. 110).

Elliott (2017) also discusses these three dominant frameworks, arguing that the connection to nature discourse is no longer enough to address global environmental issues since it often rests on the assumption of a nature-culture binary that led to problems in the first place. She argues that the other two discourses around children’s rights and posthumanism “offer more potential for building momentum, but with some inherent challenges for educators as they navigate the assumptions and misconceptions of the sustainability-nature nexus” (p. 305). A recent book, *Researching Early Childhood Education for Sustainability: Challenging Assumptions and Orthodoxies* (Elliott et al., 2020) includes work related to ethics, history, and practices that provide some breadth and richness to this field. Interestingly, in a chapter in this book, Carr and Plevyak (2020) suggest that the American movement needs to shift towards inclusion of sustainability concepts to address major environmental issues such as climate change. Further, five Canadian researchers (writing in two chapters, out of 33) are represented in the book, indicating that Canadians are also contributing to international dialogues in this field. Canadian researchers, then, seem to be motivated by, and engaged with, both the American ECEE field and the international movement of ECEfS.

As I have noted, several researchers see promise in applying a posthuman framework to ECEfS. As Weldemarian (2017) explains:

... the recurring curricular and pedagogical themes within ECEfS include the outdoors as a learning environment; teacher training and competence; place-based pedagogy; the project approach; storytelling; children’s rights and community participation; advocacy; relationships and interactions with nature; the recognition of the child’s uniqueness; the notion of agency; and the value of partnerships between home and the early years settings. The post-humanism/new materialism perspective challenges such approaches. (pp. 114-115)

Weldemarian (2017) thus agrees with Somerville and Williams (2015) and other common worlds researchers that posthumanism offers a new approach for addressing sustainability in early childhood education. They argue that there should be more posthumanist research within early childhood education for sustainability, and that it could build upon the few studies that have been conducted to date (e.g., Duhn, 2012; Ritchie 2012).

Since the “child in nature” discourse has been so influential in the development of ECEE/ECEfS and presently influences many practitioners’ perspectives, in the next section of this review I discuss and critique the “back to nature” narrative. I then elaborate on the topic of children’s rights and agency within research, before moving on to discussing research specifically on forest school pedagogy and practice.

Limitations of the Back to Nature Narrative

A review of the literature reveals that many early childhood environmental education practitioners and even some researchers rely heavily on popular writer Louv’s work as a pedagogical rationale for nature-based education initiatives such as forest school. Take the following example from Dean (2019):

When children are educated outside of the classroom, they are able to grow in stewardship, leading to academic gains, as well as key problem-solving and critical-thinking skills (Louv, 2008). Thus, a child who attends FS [Forest School] at a young age will be able to grow in his or her ability to relate to nature. This will inevitably lead to a joy towards natural and wild spaces that is founded upon academic knowledge (Louv, 2008). (Dean, 2019, p. 61)

Louv's work popularizing the back to nature movement has been very impactful, inspiring new outdoor programs and a revival of nature play and natural science study, as seen for example in the work of the US-based Children and Nature Network (<https://www.childrenandnature.org/>). Nonetheless, it is important to take a step back and examine the underlying assumptions of this movement.

Dickinson (2013) has critiqued Louv's concept of a "nature-deficit disorder," arguing that it is a theory about child-nature separation that fails to examine the roots of environmental problems. She writes, "while certainly meaning no harm, scholars and practitioners can inadvertently do a disservice by oversimplifying and omitting deeply embedded cultural matters" (p. 318). The way nature is portrayed and the type of connection to nature that Louv promotes could actually be reifying the child-nature divide; she cites, for example, the way Louv constructs nature as "something from which children recently have fallen and need to return" (p. 320). He also promotes natural science activities that Dickinson argues can create not only distance but an overemphasis on cognitive aspects of learning. These activities "do not automatically create connection, affect, or emotional attachment; they may pose challenges and obscure environmental issues, not by what humans do during these practices, but the mindset and assumptions that undergird them" (p. 322). Dickinson therefore calls for a rethinking of nature-

deficit disorder discourse, suggesting that it is important to add a cultural dimension to these narratives and include ideas from ecopsychology such as an inward expansion, emotional expression, and connectedness. Fletcher (2017), building on this line of critique, argues that the idea of reconnecting to nature is an oxymoron that does not sufficiently help the field of environmental education reach its goals.

While not everyone concerned about child-nature separation uses pseudo-medical nature-deficit disorder discourse, the need to return children back to nature remains a prevalent theme in much early childhood environmental education. As Born (2019) has observed, many nature-based early learning programs:

... unintentionally frame nature and animals merely as pedagogical tools rather than living, sentient beings, places, and/or systems with their own experiences and co-creating lifeworlds alongside children ... However well-intentioned this narrative may be, it ignores a needed shift toward a paradigm of humans living alongside and within nature. (pp. 36-37)

It is not just early childhood environmental education that is built on such assumptions, of course. As Rautio et al. (2017) write, “to be able to go beyond the initiatives of simply inserting the child back into nature requires first recognizing the grounding anthropocentric philosophies of education at large and environmental education” (p. 1380). Indeed, education and environmental education writ large has been critiqued numerous times over the years for anthropocentrism and speciesism (e.g., Bell & Russell, 2000; Fawcett, 2013; Oakley, 2019; Russell, 2005; Russell & Bell, 1996; Russell & Spanring, 2019), illustrating how tricky it is for most of us to recognize our deeply ingrained belief in human supremacy.

It also seems difficult for many of us to recognize our complicity. No wonder, then, that Gough and Whitehouse (2018) felt the need to remind us that humans living in widely diverse contexts have had an impact on nature all over the planet, which therefore points to another reason why the notion of reconnecting children with nature needs to be troubled and reconceptualized. An example of such troubling is Malone's (2016) research with street children in La Paz, Brazil and their relationships with dogs. In this context, nature is found everywhere but not at all like the untouched ideal described by early romantic thinkers and perpetuated by those who seek to return children to some idyllic past. Malone's work counters the romanticized and developmental view of the children and nature movement. There are many other examples from common worlds researchers, which I will describe throughout this literature review.

Children's Agency and Rights within ECEE/ECEfS Research

Children's participation in research can be seen to be on a continuum from research conducted *on* children, *with* children, and *by* children, where the latter points to children as being co-researchers themselves and included in all steps of the research process (Barratt Hacking et al., 2013; Green, 2015). Some of the methods that have been successfully used to honour children's voice and perspective are conducting interviews with children, observing peer-to-peer interactions, and informal activities such as drawings and tours (Green, 2015). In my own Master's research, I applied the "mosaic approach" developed by Clark and Moss (2011) whereby different forms of data are brought together to represent children's perspectives. I used methods such as observations, audio-recording, child-led photography and drawings, as well as educator questionnaires to capture the children's experiences of nature-focussed educational programs.

As was noted in Somerville and Williams's (2015) literature review, many researchers have specifically examined children's rights within environmental education research. Indeed, this is something I outlined in an article I wrote on the main challenges and opportunities of conducting environmental education research with children (Boileau, 2013). I discussed children's rights and ethical issues as being one of the challenges as well as navigating issues of consent. Green (2015) suggests that it is important for environmental education researchers turning to the ECEE and ECEfS fields to "critically examine the philosophical, theoretical, and methodological underpinnings regarding what it means to do research involving young children" (p. 208). Some of the concerns include confidentiality, being transparent about the purpose of the research, securing consent from parents and children, and "mitigating power imbalances between the researcher and children participants" (Green, 2015, p. 210).

The foundation for this discussion is the rights that children are afforded under the UN Convention of the Rights of the Child, which is "a comprehensive human rights treaty recognising children as rights-holders possessing civil-political, social, economic and cultural rights" (Golhagen et al., 2020, p. 3). Although children have not traditionally been included in discussions of environmental policies and laws, children are also environmental rights holders and are directly affected by matters of environmental concern (Makuch et al., 2020). The UNCRC recognizes children's right to be heard and taken seriously (Goldhagen et al., 2020), thus their active participation in research is important. Further, adults have a responsibility to uphold children's rights (Blanchet-Cohen & Elliot, 2011).

Makuch et al. (2020), in their recent study, asked 10-12 year old children in the UK to complete a questionnaire aimed at better understanding which environmental issues were most important to them. Their results show that the right to access clean drinking water was the most

important environmental right reported by the children, followed by the right to protect the environment. Interestingly, many children (60% in their study) reported that the environment should be protected for its own sake rather than for the sake of humans, thus the authors comment that although human rights discourse is clearly anthropocentric, there can still also be ecocentric benefits. Surely, there is convergence of goals that aim to protect the health of ecosystems and the health of children. Ultimately though, children's rights still need to be further included into policies and practices so that they reflect the growing efforts being made within research (Goldhagen et al., 2020; Makuch et al., 2020).

This section has provided a brief overview of historical influences, early childhood environmental education and early childhood education for sustainability research, a critique of the back to nature rhetoric, and a discussion of children's rights within the research process. Now that my research has been more broadly contextualized, I move to a discussion about forest school pedagogy more specifically, including a description of the history of this educational approach, research conducted on forest school programs, and existing critiques of this approach.

Forest School: History, Pedagogy, and Research

History and Pedagogy

The origin of forest school is often credited to Denmark (Dean, 2019) or Scandinavia more generally where there is a long tradition of being close to nature and the land (Knight, 2009). The forest school ideology was transplanted abroad in the 1990s after groups of early childhood educators from places such as the United Kingdom visited Denmark. They returned inspired and started applying forest school principles in their own contexts. Also called "nature preschools," "forest kindergartens" or "bush kindies," today there are thousands of these

programs in Scandinavian countries, Germany, the UK, Australia, New Zealand, many Asian countries, the US (Sobel, 2016), and Canada.

In her historical account of forest school, Dean (2019) discusses how the early theorists and researchers mentioned in the overview I provided earlier helped pave the way for the inception of forest school pedagogy, noting that:

... a combination of a growing interest in outdoor engagements and a rising understanding of early childhood development through expert educators laid the groundwork for FS [forest school] to take root in many Western nations. The foundation for FS was established by a combination of work carried out by philosophers, naturalists, and educators that developed into the current concept of FS learning. (p. 55)

Dabaja (2021b) comments that although definitions of forest school vary from country to country and have a flexible aspect, there are some similarities in the definitions proposed in the UK, Australia, and Canada, notably the emphasis on “children’s regular visits to a natural site” (p. 3) and that “outdoor sessions should take place in nature” (p. 3), which would be a broad way to include the various types of ecosystems found worldwide. Other common aspects include play-based and inquiry-based approaches (Dabaja, 2021b).

In the US, nature-based programs mostly take the form of *nature preschools* that are typically licensed part-time early childhood programs where part of the day takes place outside; many are offered through nature centres and zoos (Larimore, 2016). While nature preschools tend to offer a combined outdoor and indoor experience, forest kindergartens there tend to take place entirely outdoors (NAAEE, 2017). A recent survey in the US found that there were 585 reported nature-based programs, more than a doubling in just the previous three years (NAAEE,

2020). The authors also note the “possibility that the [COVID-19] pandemic might boost the growth of nature preschools over the coming years” (NAAEE, 2020, p. 6).

Here in Canada, the first outdoor nature program to utilize the label forest school was Carp Ridge Forest School in Ottawa that opened in 2007. Since then, programs have sprung up all over the country, notably in Ontario and British Columbia, and they predominantly cater to urban families (Nelson et al., 2018). There appears to be significant demand for these programs; for example, parents waited three days, pitching their tents in the wet and cold, to register their child in a new nature kindergarten class in Victoria, BC (Nelson et al., 2018) and amid the COVID-19 pandemic, outdoor programs have seen a huge increase in demand from families in the Toronto area (Appia, 2022).

Practically speaking, forest school is an educational approach that is based around the central concepts of play, place, and nature. Thus, the experiences with the children often revolve around local ecology, outdoor activities, nature-themed games, and exploration of the natural site. A small-scale survey of Canadian forest school practitioners conducted by Boileau and Dabaja (2020) identified some common characteristics of Canadian forest schools. They found that, typically, forest school is offered to three- to five-year-olds as well as elementary school-aged children. Since it is more of a pedagogical approach than a specific curriculum, programs take many forms – from weekly class outings to a nearby forest to full-time programs held mostly outside. Programs can be private or operate in the public-school system, although the latter is still rare in Canada.

With the aim of coordinating the forest school movement in Canada, the Child and Nature Alliance (CNAC) started an initiative called Forest School Canada (FSC) in 2012. One important program they offer is the year-long Forest and Nature School Practitioner Course that

is in high demand for each intake. This organization published a booklet in 2014 that provided basic information for practitioners such as the types of play children typically engage in during forest school, how to manage risky play, the main potential benefits of forest school, and pedagogical principles (Forest School Canada, 2014). Since then, the principles have been reviewed and published on the CNAC website. While there were originally 12 principles, there are now 10, which are as follows:

Forest/Nature School:

1. “Takes place in any outdoor space, including urban greenspace, playgrounds, forests, creeks, prairies, mountains, shoreline, and tundra.
2. Is a sustained process of regular and repeated sessions in the same outdoor space, supporting children to develop a reciprocal relationship with the Land, and an understanding of themselves as a part of the natural world.
3. Views children and youth as innately competent, curious, and capable learners.
4. Is led by educators who share power with learners through play-based, emergent, and inquiry-driven teaching and learning methods.
5. Values children’s play – self-directed, freely chosen, intrinsically motivated – in and of itself. FNS programs provide adequate time and space for children and youth to dive deeply into their play.
6. Views risky play as an integral part of children’s learning and healthy development, and is facilitated by knowledgeable, qualified educators who support children and youth to co-manage risk.
7. Relies on loose, natural materials to support open-ended, creative play and learning.
8. Values the process as much as the outcome.

9. Prioritizes building reciprocal relationships with First Nations, Métis, and Inuit, who have been learning from this Land since time immemorial.
10. Practices, policies, and programming reflect and prioritize the building of engaged, healthy, vibrant, and diverse communities through consideration of access and equity in our decisions and actions.” (Child and Nature Alliance of Canada, 2020, para. 3)

There have been notable updates since the outset, such as Principle 9 that addresses the need to include reciprocal relationships with Indigenous communities and Indigenous knowledges in education. The Child and Nature Alliance of Canada is also currently undertaking a community consultation project to solidify forest and nature school infrastructure across Canada, thus in the next few years, there will likely be more improvements to training and a more formalized system that they hope will help ensure quality of programming within Canada to meet the growing demand (see <https://childnature.ca/community-consultation-project/>).

Research on Forest Schools

Since the implementation of forest school programs in Europe and elsewhere, a strong need for research has been articulated. Are the programs delivering the intended benefits for children? Is the funding and expansion of these programs justified? How can practices be improved upon? What are the problems and limitations of this educational approach? Although still fairly limited, international research on the forest school educational model has expanded rapidly in the past decade (e.g., Dabaja 2021a, 2021b; Knight, 2018; Lysklett & Berger, 2017; Waite et al., 2016) and has begun to try to answer some of these questions.

One particular issue when reviewing the literature on forest schools is finding appropriate keywords to search since programs and pedagogies have alternate names depending on the country, and the terminology used to describe the various early childhood environmental

education programs is not consistent (Larimore, 2016). Furthermore, I am not proficient in languages other than French and English and therefore cannot include research in other languages. Dean (2019), in her recent review of literature on forest schools, notes that “an extensive online journal search reveals that the majority of FS research in the English language originates from the UK or Canada” (p. 59) and that some research from Scandinavian countries has now been translated into English, making their findings increasingly accessible.

To date, most of the studies have been small-scale case studies and/or ethnographies, which are commonly used methodologies in educational research with young children. A few of the main topics explored are: educator perspectives and roles (e.g., Connolly & Haughton, 2017; Harris, 2015; Mackinder, 2017); program descriptions and implementation (e.g., Elliott & Chancellor, 2014; Lysklett & Berger, 2017; Maynard, 2007); nomenclature and categorization of programs (Finch & Bailie, 2015; Larimore, 2016; Sobel, 2014); and cultural contexts (e.g., MacQuarrie, et al., 2015; Waite et al., 2016). There are also studies aiming to assess the benefits or impacts of forest school programs on the children and/or community (e.g., Elliott & Chancellor, 2014; Müller et al., 2017; Murray & O’Brien, 2005; Slade, et al., 2013). Recently, Mycock (2019) explored, through ethnographic research, whether forest school can create a space for more-than-human pedagogy that responds to the Anthropocene despite its humanist pedagogical grounding.

Generally, research indicates that forest school has several benefits for children and that forest school potentially fosters children’s positive relationships with nature. Advocates of the forest school approach draw from broader research on children and nature, anecdotal evidence, practitioner books, websites, and other guiding documents to boast of the following benefits to children: increased self-esteem, self-confidence, independence, social skills, physical skills, and

increased knowledge of and affinity for nature. One of the largest studies of forest school programs to date, conducted by Murray and O'Brien (2005) in the UK, aimed at assessing the validity of some of these strong claims. Through participatory action research, 24 children aged three to nine selected at random from seven participating schools were studied over an eight-month period. Six positive outcomes for students were identified in this research: confidence, social skills, language and communication, motivation and concentration, physical skills, and knowledge and understanding.

Many of these benefits are mentioned in other studies as well. For example, a team of undergraduate researchers studying adult perspectives on forest school programs in the UK found that "exercise was ranked most highly by parents and school staff as the benefit of forest school, followed by learning about the environment, learning to care for the environment, fresh air, happiness, practical skills, physical coordination and language which all ranked over 4 on a scale ranging from 0-5" (Davis & Waite, 2005, p. 14). A case study by Cumming and Nash (2015) in Western Australia found that "bush sessions" had an important impact on the children's "personal connections and sense of place; relational connections; and pride, inclusivity and sense of belonging" (p. 301). Also in Australia, Elliot and Chancellor (2014) conducted a study on a pilot "bush kinder" program. Bush kinder programs are the most prominent type of outdoor nature-based program for young children in Australia, and follow a similar pedagogical approach as forest schools. Through teacher interviews and parent questionnaires, Elliot and Chancellor (2014) found that children enrolled in the bush kinder program were less dependent on manufactured toys at home and instead collected rocks and other natural materials for creative play, that children's play in the bush kinder sessions was less gender stereotyped, more collaborative, and more physical, and that children were increasingly interested in investigating

the natural world. A Canadian study on a forest school program in Ontario found that children were more than twice as physically active on days when they were participating in forest school compared to their days in a childcare centre, and that the forest environment afforded more opportunities for a variety of physical play (Harwood et al., 2017).

Studies of the benefits of forest school also seem to indicate that children's knowledge and awareness of the natural world increases, which is not surprising given that children spend extended periods of time in natural settings and are generally curious about their surroundings. For example, Turtle et al. (2015) found that participation in a forest school program was shown to have an impact on children's environmental attitudes. This UK study utilized pre- and post-program surveys with classes of children in six different schools, some who were participating in forest school and some who were not. The finding that children participating in forest school demonstrated pro-environmental attitudes significantly more so than the other children is important, however the researchers note that further research is needed since many other factors could be at play (Turtle et al., 2015).

In their recent review of 13 studies, Smith et al. (2018) concluded that there was potential for forest school to foster children's relationship with nature. They found the following themes emerged in various studies of forest school: increased knowledge about nature/environment (this was the most frequently reported outcome relating to the child-nature relationship); understanding of the outdoor environment/nature; improved relationship with the outdoors; pride in knowledge of nature/local environment; ownership of the local environment (such as attachment to the site); and impact beyond forest school.

In contrast, a comparative study in British Columbia where children in a nature kindergarten (NK) and children in a regular kindergarten class were tested on a variety of metrics

at the beginning and end of the school year showed that, although nature kindergarten seemed to have a positive impact on children's motor skills, social skills, and well-being, it surprisingly did not have a positive impact on the children's nature relatedness and environmentally responsible behaviour (Müller et al., 2017). The authors note that this could be related to the method they used (i.e., a board game) and they acknowledged that "there was some anecdotal support for higher levels of nature relatedness in children in [nature kindergarten]: when we accompanied them on their walks into the woods we were impressed by their knowledge of flora and fauna. This cognitive aspect of nature relatedness, however, was not assessed in our study" (pp. 59-60).

Most recently, Dabaja (2021a, 2021b) conducted a systematic literature review of forest school publications in English from 2000 to 2019 that described the impacts of forest school. 28 articles were examined, of which 21 came from the UK, three from Canada, two from Denmark, and one each from Australia and Ireland. Dabaja notes that most of the research has been conducted qualitatively through methods such as interviews, focus groups, observations, informal conversations, and photographs. Seven primary positive impacts were reported in these studies, which are in line with the studies and other reviews previously discussed:

... the improvement of the children's (1) social and cooperative skills; (2) physical skills; (3) self-confidence and self-esteem (4) learning performance and cognitive skills; (5) emotional and mental wellbeing; (6) environmental awareness and sense of belonging; and (7) risk management skills. (Dabaja, 2021b, p. 7)

As is evident from the literature I have described, there is already valuable data on forest school programs and pedagogy. There have, however, been several notable criticisms of pedagogy and practice as well, which I now discuss.

Critiques of Forest School Pedagogy and Research

The first issue of the 2018 *Journal of Outdoor and Environmental Education* was a special issue focused on forest schools. The first article is by Leather (2018) and contains some of the critiques he has written about in the past (e.g., Leather, 2015), followed by several subsequent articles written in response to his work (e.g., Knight, 2018; Lloyd, Truong, & Gray, 2018; Waite & Goodenough, 2018). This issue provides a rich overview of recent conversations within the realm of research on forest schools.

The first point Leather (2018) makes is that forest school is a social construction and that forest school has been taken out of the Scandinavian context and applied to other countries and cultures without proper consideration for how to adapt the program to other cultural values; he has called this a poor “translation.” Leather’s (2018) concern seems very applicable to the Canadian context since the pedagogical principles suggested by Forest School Canada draw heavily from the UK principles, which are themselves an adaptation of the Scandinavian approach. To use his phrasing, it could be said that forest school is “still being translated” in Canada and that it is not possible for the approach to be dragged and dropped into a new community since the local education system, regulations, market, and cultural values will enable and limit how forest school will be implemented (Power et al., 2015).

Indeed, others have also argued that although the pedagogies used may have commonalities such as “a natural setting, experiential learning, and student-led engagements” (Dean, 2019, p. 55), forest school is enacted differently in different political and social contexts (Nugent & Beames, 2015; Waite et al., 2016; Waite & Goodenough, 2018). As McNair (2012) writes, “there will always be diverse definitions of what constitutes a forest school but like all

experiences offered to the children it should reflect the culture and community in which children live” (p. 5).

A second critique that Leather (2018) offers is around the lack of exploration of the philosophy and theory underpinning forest school pedagogy. He notes, for example, that training materials and books aimed at practitioners only briefly offer a theoretical component. This critique has also been made by others such as Harris (2015) who wrote that forest school “is an area where practice has preceded debate and theoretical development” (p. 276) and Waite et al. (2016) who wrote that the literature “often fails to look beneath description of practices and outcomes to the underlying philosophical and pedagogical basis for their implementation” (p. 869). Therefore, more research is needed that delves into the assumptions, philosophies, and theoretical basis of forest school pedagogy.

Leather’s (2018) third main critique is around the commodification of forest school programs. This is echoed by Waite et al. (2016) who write that the “increasing commodification arises both from commercialization of external forest school business providers and through colonization of the approach by mainstream educational agenda ... creating tensions between purpose and practice” (p. 883). This aspect is predominantly a UK-based conversation that relates to the political and economic context of that country and is beyond the scope of this study.

What is clear is that there are certain research gaps when it comes to understanding forest school pedagogy and its implementation in different contexts. Even though small studies have started to provide data, being a relatively new phenomenon, there remains much to be done. Smith et al. (2018) note that “whilst there is a wealth of Forest School research available it is currently fragmented” (p. 531) and that “much of the evidence available to support claims Forest

School meets its aims is anecdotal and observational, which is notoriously difficult to capture” (p. 532).

There is also little Canadian-based research. At the moment, there are only a handful of journal articles (e.g., Elliot et al., 2014; Elliot & Krusekopf, 2017; Harwood & Collier, 2017; Hoyland & Elliot, 2014; MacEachren, 2013, 2018; Power et al., 2015) and master’s theses (Coe, 2013; Moore, 2014; Perez, 2016; Urbaniak, 2013; Welz, 2014) published on research conducted in Canadian forest schools. In recent years, Canadian research has expanded to include large-scale survey studies on Canadian practices (Boileau et al., 2021; Boileau & Dabaja, 2020; Harwood, Boileau, et al., 2020) that help contextualize anecdotal information and findings from smaller-scale studies.

As is evident from this research review, most research efforts have focused on humans. There has been little attention to the more-than-human world within forest school pedagogy. This is not surprising given that educational approaches in general tend to be human-centric, and that forest school pedagogy is grounded in a constructivist approach that assumes children create their own knowledge based on human social interactions (Coates & Pimlott-Wilson, 2019). One notable exception is Mycock’s (2019) reflection on her ethnographic study of two forest schools in the UK. She wondered “whether any other kinds of learning might be taking place in forest schools, beyond the formal and embedded humanist pedagogies” (p. 2) and indeed found that through children’s encounters with forest others such as worms, beetles, mud, and trees, the humanist and scientific orientation of the programs was often disrupted and forest school pedagogy was exceeded. She writes that:

Instead of simply learning about the nature of life in the forest as separate from themselves, [the children] had embodied and affective experiences of their own

entanglements in forest “naturecultures” and engaged in the process of collective world making (Haraway, 2008). These encounters and intra-actions provided opportunities for the children to recognize the agency of nonhuman others, and to practise an ethics of care based upon an appreciation of the obligations of mutual vulnerability. (p. 12)

It is very likely that children in other forest school sites also have opportunities to explore the more-than-human world in a similarly embodied, sensory, spontaneous way, even in programs that have a scientific and humanist focus.

I end this section on research on forest school programs with a last critique that brings me back to the Canadian context, which focuses on the inclusion of Indigenous scholarship. MacEachren (2018) points out that there can be a clash between a child-centered, play-based pedagogy and Aboriginal pedagogies and values. For example, the notion of respecting Elders and considering them as Knowledge Keepers contrasts with children learning on their own through their personal experiences. She uses another example of children watching complex hand skills that is traditionally part of early education in Indigenous communities and wonders how that might fit with a forest school pedagogy, stating that “to develop an authentic Canadian early childhood curriculum, [forest school educators] need to examine the assumptions behind the emphasis of child and play centered pedagogies that accompanied the introduction of [forest school] to this country” (p. 96).

Nxumalo (2019) also asserts that many nature-based approaches based on the European forest school model can:

... reinscribe settler colonialism through persistently anthropocentric, romanticized apolitical and ahistorical approaches to place ... In these approaches, nature is

figured as a mute and untouched site for nurturing individual child development and building individual children's environmental stewardship while erasing Indigenous presences and reinscribing colonizing imaginaries of "pure" Canadian "natures." (p.18)

As child-centered learning is a core concept of forest school, this line of critique is an important one to heed. I will further discuss the connection to Indigenous perspectives and worldviews in the next section, as well as describing research on multispecies relations and land-based education.

Multispecies Relations, Connections to Place, and Indigenous Perspectives

There are many connections to be made between outdoor education, Indigenous perspectives, efforts to decolonize education in Canada, place- and land-based learning, and learning with animal kin and other worldly relations. Here I will discuss some of these concepts, but I preface this with a note that it was not feasible to conduct extensive literature reviews in each of these distinct areas of research. Therefore, I present an overview with highlights of research and ideas most closely connected to my research context and topic.

Research on Children and Animals

When engaged in outdoor play and learning, children encounter biodiversity in various forms depending on the type of setting (protected forest, urban park, etc.). Multispecies relations have been discussed within environmental education for many years (for earlier work, see Bell & Russell, 1999, 2000; Fawcett, 2002; Russell & Bell, 1996), but have been gaining more attention recently (see Russell & Spannring, 2019; Spannring, 2017), particularly within common worlds research (see Common Worlds, 2020). In this section, I primarily discuss child-animal relations, acknowledging of course that children's lives are also enmeshed and entangled in various ways

with countless other types of living beings like plants, bacteria, mushrooms, and so on. I focus on animals for several reasons: young children have a better conceptualization of animals than plants or nonliving objects (Fouquet et al., 2017); children, as humans, are of course animals and can recognize their own animalness (Russell & Fawcett, 2020), and several key books in the field have focused on children and animals (e.g., Melson, 2001; Myers, 2007; Selly, 2014).

The relationship between young children and animals has been extensively researched although mainly from a developmental psychology perspective (e.g., Borgi & Cirulli, 2015; Hawkins, 2018; Kellert, 1985; Waxman et al., 2014). Indeed, Russell and Fawcett (2020) write that “many studies of child-animal relationships tend to focus on the impacts of those bonds on children’s cognitive, emotional, and moral development, with little consideration to the agency, well-being, or subjective experiences of the animals themselves” (p. 1347). This more traditional research approach has been critiqued as being too narrow (Fawcett, 2013; Rautio et al., 2017; Russell & Spanring, 2019). However, alternative perspectives have been emerging (Fawcett, 2013; Russell & Fawcett, 2020). For example, Born (2018) explores the role of adults in helping children develop connections with other animals, observing that there is often a missed “opportunity to allow for the multispecies interaction to occur, which can be a meaningful and intimate connection between child and animal that happens between those two beings on their own terms” (p. 51). She advocates learning *with* animals, not just *about* or *for* them, because it acknowledges animals as partners and beings with agency of their own (see also Bell & Russell, 1999; Russell & Bell, 1996).

Inspired by Malaguzzi, who suggested that the environment should be seen as the third teacher in early childhood education (a critical tenet of the Emilia Reggio approach), Bone (2013) proposes that animals should be considered as the fourth. In her literature review article,

“The Animal as Fourth Educator,” she argues that animals play an extremely important role as educators themselves, by teaching children about life, love, and empathy. In early childhood settings, where animals are often kept for observation in classrooms or as companion animals, educators need to engage in reflective practice and be critical about what the children are learning through their relationship with the animals—the hidden curriculum all too often is that the animals end up being seen as disposable and replaceable (Bone, 2013; Nxumalo & Pacini-Ketchabaw, 2017).

Indeed, in the past 10 to 15 years there has been an “animal turn” in social science research generally and education specifically, with an increasing interest in looking at child-animal relationships from broader perspectives (Oakley et al., 2011; Ogden et al., 2013). Spanning (2017), in her review of literature on the ways animals feature in environmental education research, writes of the turn towards a posthumanist and interspecies paradigm in the last few decades. She advocates, much like Bone (2013), for animals to be seen as teachers and for a “learning space that is characterized by attentiveness and responsivity towards nonhuman animals ... [that] implies an ethical component” (p. 67). Russell and Fawcett (2020) also argue for a broader approach to cultivating child-animal relations: “To learn and teach from such an ethical, convivial standpoint—children in creative conversation with each other and their animal environments, realizing their interdependence—is a vision worth realizing on our collective pedagogical horizon” (p. 1352).

One perspective on studying multispecies relations in early childhood education is to closely examine the interactional moments between children and other beings. Kahn et al. (2018) have identified around 150 “interaction patterns” that describe how humans (mainly children) come into contact with nature in various ways. Some of these describe interactions with animals,

for example: children imitating animals, recognizing, and being recognized by a nonhuman other, and looking at wild animals (Kahn et al., 2020). In fact, the latter may be one of the primary methods children use to interact with animals:

One of the strengths of a nature preschool is that it affords children the opportunity to look at wild animals or at least non-domesticated animals that are not in captivity, such as insects, lizards, squirrels, and birds... The animal is free, in its own habitat. The child is free to look at the spider or not and to marvel or not. The child is not trying to control the spider; no more than the spider is trying to control the child. It is a relationship of mutuality. (Kahn et al., 2018, pp. 12-13)

With the emergence of posthuman research, multispecies relations have increasingly been explored with an eye to ethical relations, sustainability, interrelations, and mutual vulnerability. Somerville (2020) reviewed posthumanist research in child-nature relations using Haraway's (2016) "bag lady stories" as a method. The first category she noted was research around child-bird relations. Somerville found that:

... by combining these different stories of chooks, ravens, and crows in this bird bag category, the category "bird" itself is fundamentally destabilized, as it becomes evident that in each case, the bird animal becomes other in their human encounters. In this way, species constructs, which differentiate human from animal, break down at the edges like Haraway's frayed and porous bags. The questions "what is a life" and "what is a death" are fundamental in this category. (p. 117)

The second category she found was large animals, noting various studies have looked at animals such as bears, racoons, kangaroos, and dogs. Here, she found the concept of mimicry recurred. Several examples described children and animals who were:

... each trying out what it might be like to be other, animal-becoming-human, and human-becoming-animal. In each case, the other is required, neither animal nor human can be seen as initiating the interspecies mimicry, and there is no particular purpose except the experience of sameness. (p. 120)

The third category that emerged in Somerville's review was small animals, which featured in seven publications she reviewed. These examined children's encounters with insects and other small invertebrate animals such as worms, bees, and walking sticks. As with the other two categories, Somerville notes that researchers tend to frame this work around discussions of ethics and politics. In many encounters with small animals, death is a common discussion point, echoing other literature on children and animals (e.g., Boileau & Russell, 2020; Ghafouri, 2014; Nelson, 2020; Russell, 2017; Russell & Fawcett, 2020).

One way the child-animal relationship can play out is through a sense of kinship. Fawcett's research (2002, 2014) has shown that children, especially at a younger age as with the kindergarten students in her study, sometimes see animals as kin and friends even when these animals are not companion animals or typical "cute" species associated with childhood. Further, in her research with children and bats, she found that exposure to live animals can help dispel misconceptions that form around school-age and instead encourage a sense of kinship.

The idea of kinship focuses on interdependence and interrelations and thus fits well with a common worlds approach. Wilson (2019) speaks of kinship as a different "realm of relationship with nature" (p. 31) since "once we view other living creatures as kin, we can no longer claim dominance over them or think of ourselves as separate from them" (p. 29). She argues that kinship between children and over living beings can be fostered when:

... we speak of animals and plants as living creatures sharing a common home with all other creatures—both human and non-human. Kinship is also fostered when we express and encourage ecological perspective-taking—that is, taking the perspective of animals or plants or seeking to understand how they are being impacted by circumstances around them. (p. 31)

The notion of kinship is also an important aspect of Indigenous ways of knowing and being in the world. For thousands of years, Indigenous people have understood plants, animals, and landscape as kin (Salmón, 2000). For example, Salmón (2000) writes:

With the awareness that one's breath is shared by all surrounding life, that one's emergence into this world was possibly caused by some of the life-forms around one's environment, and that one is responsible for its mutual survival, it becomes apparent that it is related to you; that it shares a kinship with you and with all humans, as does a family or tribe. (pp. 1331-1332)

Another example is the work of Todd (2018), a Canadian Métis researcher, who discusses human-fish relations in Northern and Western Canada, tying in water conservation politics, Indigenous relations with fish, environmental issues such as oil spills brought on by colonialism, and her own culture and history. She argues that Indigenous perspectives of fish as kin and “more-than-human persons” (p. 74) hold promise for rethinking current legal-ethical responsibilities to fish and the land. She suggests that we “must ask fish, who have survived so many shifts and transformations of worlds over millions of years, what their philosophies and theories are” (p. 69) and that we work toward fulfilling our reciprocal responsibilities.

Having discussed children's relations with other species, I now turn to children's relations with place; these comprise two of the three main topics of exploration by the Common Worlds Research Collective (Common Worlds, 2020).

Connections to Land and Place

Connecting to the land and place is not a new concept, however it has not always featured prominently within education. Sobel (2005) was one of the first to popularize the idea of place-based pedagogy in the contemporary American environmental education sphere. He was inspired by ideas like Leopold's "land ethic" (1990) and he focused on the opportunities afforded by the local community and environment for teaching various subjects and to involve school-age children in real world, concrete social and environmental contexts. He argued that this approach to education "increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens" (Sobel, 2005, p. 7). An example of how these ideas have been taken up in early childhood environmental education can be found in Pelo (2013) who chronicles her year exploring a local urban environment with a toddler:

Rather than contribute to a sense of disconnection from place by writing off our most urban environments as unsalvageable or not worth knowing, we can instill in children an attitude of attention to what exists of the natural world in their neighborhoods. The sense of care for and connection to place, then, can become the foundation for critical examination of how that place has been degraded, as children grow older. (p. 45)

Place-based pedagogy has become very popular with both practitioners and scholars (e.g., Altman et al., 2015; Cox et al., 2011; Cumming & Nash, 2015; Goralnik et al., 2014;

Gruenewald, 2003; Lloyd, Truong & Gray, 2018) and has been identified as a recent trend in outdoor education (Sabet, 2018), but has not gone without critique. Wilson (2019) writes that “pedagogy in a Western tradition tends to focus on learning about trees and other elements of nature versus honoring and deepening the relationship” to a place (p. 30). A number of Indigenous scholars and allies have argued that there are some important elements missing from the place-based education model and thus prefer to call their work land-based or Land education (e.g., Calderon, 2014; Scully, 2012; Tuck et al., 2014). Calderon (2014) reminds educators that a discussion of place cannot be had without connecting to Indigenous history and ongoing settler colonialism, noting that it is “essential to form relationships with Indigenous peoples to relearn about the place we live” (p. 28). Indeed, as the Child and Nature Alliance of Canada states (at the time of writing) on the main page of its website (www.childnature.ca), “relationship with the Land is at the heart of what we do, and this Land is Indigenous Land.”

Johnson (2012) writes of a critical pedagogy of place that “recognizes the concrete experiences of communities grounded in shared histories, stories and challenges” and that “seeks to decolonize and reinvent the storied landscape through ‘reading’ the ways in which Indigenous peoples’ places and environment have been injured and exploited” (p. 829). Thus, he argues that “place” is a complex term that can be conceptualized in two ways: as a way of knowing, understanding, and learning about the world, and as an embodied location of everyday struggles for political, cultural, and economic meaning. He also notes that landscapes carry stories that can be read, but that Western thought has distanced many from this knowledge. The specific place where an educational program takes place, therefore, affects the knowledge that is created.

Salmón (2000), who writes of a kincentric ecology that guides ethical and respectful human-land relations in an Indigenous community in Mexico, explains that “to indigenous

people, humans are at an equal standing with the rest of the natural world; they are kindred relations. In addition, Indigenous people believe that the complex interactions that result from this relationship enhance and preserve the ecosystem” (p. 1331). When humans understand themselves as one interconnected part of nature and when they respect the more-than-human world as having intrinsic value, they may develop deep connections to a place, as Indigenous people have for thousands of years.

According to Ulmer (2017), posthumanism and Indigenous perspectives could greatly inform each other, especially when it comes to examining relations to Land: “For researchers who work within and across posthumanism, new materialisms, and/or Indigenous research, therefore, there are opportunities not just to consider how methodology intersects with land, but to examine how these various methodological approaches relate to each other” (p. 843).

Indigenous Worldviews

Of course, there are different ways to know and understand the world. Indigenous ways of knowing, which I have briefly touched on so far, are valuable in offering an alternative understanding of human-nature relations than has often been presented through a Western approach. Although I am not Indigenous and do not claim to apply an Indigenous research methodology in this study, including information about Indigenous worldviews is not only respectful of the First Peoples who inhabited the research site, but is relevant to my research queries.

Bastien (2004), a Blackfoot scholar, has written of the ways of knowing of the Blackfoot people, who are signatories of Treaty 7 and have lived on the land where I conducted my study for thousands of years. As Bastien describes:

Indigenous people have long recognized the consciousness of the natural order, in fact, since the beginning of our time. The fundamental premise of *Niitsitapi* [Indigenous people] ways of knowing is that all life forms of creation possess consciousness. The non-separation of nature and humans is one of the demarcations between Eurocentred and Indigenous philosophy. (p. 80)

More specific to local culture, she writes, “*Siksikaitsitapi* [all Blackfoot speaking tribes] are dependent upon all creation for survival. Learning how life is interdependent is therefore a preeminent objective in the educational process” (p. 95). Children learn about many values through stories and legends of *Napi*, including stories of how local landscapes were formed and certain animals came to live on the land. Bastien (2004) explains that there are several primary elements describing the epistemology of *Niitsitapi*: knowledge is holistic and revealed in nature and through connection with *Ihtsipaitapiyo’pa* [Source of Life]; learning, teaching, and knowing are reciprocal in nature; and this reciprocal nature of knowing is understood through the concept of transfer and is necessary for maintaining balance. In Blackfoot culture, knowledge, science, and religion are integrated. There are also seven sacred teachings – each represented by an animal – that act as a “moral stepping stone and cultural foundation” (Crystal Manyfingers, personal communication, March 28, 2021), which are:

- Wisdom (beaver)
- Bravery (bear)
- Love (eagle)
- Respect (buffalo)
- Humility (wolf)
- Truth (turtle)

- Honesty (sasquatch). (Crystal Manyfingers, personal communication, March 28, 2021)

Kimmerer (2013), a scientist trained in plant ecology and also a member of the Citizen Potawatomi Nation, has published her reflections on how to blend Western and Indigenous knowledge of plants. She discusses concepts such as gratitude and giving thanks to the land, seeing plants as beings and teachers, and the many gifts that nature provides humans in the form of medicine, the shade of trees, food, etc. Concepts such as respectful collection of plants is fundamental to Indigenous Peoples; for example, it is important not to pick more than half of a crop, and not to pick the first plant in case it is the last (Kimmerer, 2013). These concepts could be included in outdoor education programs since they represent an approach that is respectful of the land and present a sustainable approach.

Guided by the Truth and Reconciliation Commission's Calls to Action (2012) and the fact that all environmental education in Canada occurs in places subject to treaties or on unceded Indigenous lands (Korteweg & Russell, 2012), there have been increasing efforts to decolonize education in Canada and to better understand the role of white settler educators working in environmental and place-based education. This is complex work however, as notes Sabet (2018), since the decolonization process is multifaceted and it can be difficult to develop curriculum given the diversity among Indigenous cultures. Root (2015), a Canadian researcher writing about her own experience as a settler environmental educator trying to decolonize herself and her practice, suggests:

One of the key tenets settlers can learn from many Indigenous cultures is the intrinsic value and equality of "all our relations," or all beings. We can learn from Indigenous knowledge that this place belongs to Indigenous peoples and to all

Indigenous beings that have lived here since time immemorial. As settlers, part of decolonizing is striving to overcome Western anthropocentric attitudes and the resultant consumptive entitlement and exploitation of non-human entities. (p. 168)

Harwood, Whitty, et al. (2020) also discuss their identities as settler early childhood education scholars, contending that perpetuating Western normative thinking and colonial perspectives limits the advancements in early childhood education for sustainability. Nxumalo (2019), in her book, *Decolonizing Place in Early Childhood Education*, describes her research examining the entanglements of children, place, and Indigenous histories in British Columbia. She observes that “settler colonialism is deeply entangled within taken-for-granted banalities of everyday early childhood nature pedagogies in BC” (p. 55). As Canada struggles to mend relations between Indigenous and non-Indigenous people, one path to reconciliation could involve incorporating Indigenous traditions and educational approaches into forest school practice.

There is evidence that shifts are beginning to happen. For example, in the Forest School Canada publication (2014), there is a section on Indigenous perspectives that describes how Indigenous worldviews have much in common with forest school values and that encourages educators to consider ways to include some aspects of Indigenous pedagogy into their practice. They specifically mention the Seven Sacred Teachings mentioned earlier, and the use of storytelling, observation, and emulation (Forest School Canada, 2014). As mentioned earlier, newer materials written by the Child and Nature Alliance of Canada have emphasized Indigenous knowledges and relations (Child and Nature Alliance of Canada, 2020), which represents begins to address MacEachren’s (2018) aforementioned critique.

Having briefly described research on children and animals, land-based education, and Indigenous perspectives, it is now time to shift focus for the last sections of this literature review.

I next am going to hone in on an aspect of child-nature relations that is increasingly becoming of interest to many researchers in environmental education: the emotional dimensions of our work (Russell & Oakley, 2016).

Empathy

In examining human interactions, relations, and shifting assemblages with the more-than-human world, one fundamental aspect of this affective dance is empathy and the role it plays in making and sustaining connections. Empathy has traditionally been examined through an anthropocentric, developmental perspective (Nakao & Itakura, 2009), which I will briefly describe given it has been an important foundation for research on the topic and given that my research focus includes children. I also discuss empathy observed in other species and the ways in which empathy has been taken up in environmental education. I end with a discussion of the ideas of interspecies empathy and “entangled empathy” (Gruen, 2015).

Definition and Types of Empathy

Empathy is often thought of as the capacity to recognize another’s feelings (Noddings, 2012). It is thought to have both an emotional/affective and a cognitive aspect whereby a person adopts another person’s perspective and imagines how a person is feeling (Berenguer, 2010), which may then lead to certain actions or behaviours. However, when it comes to writing a definition of empathy, or breaking down the various components, things get quite messy, reflecting a current lack of consensus (Pérez-Manrique & Gomila, 2018). Batson (2009) explains: “The term empathy is currently applied to more than a half-dozen phenomena. These phenomena are related to one another, but they are not elements, aspects, facets, or components of a single thing that is empathy” (p. 3). He compiled the various definitions and components of empathy and lists the 8 most common uses of the term empathy:

- “Knowing another person’s internal state, including his or her thoughts and feelings” (p. 4)
- “Adopting the posture or matching the neural responses of an observed other” (p. 4)
- “Coming to feel as another person feels” (p. 5)
- “Intuiting or projecting oneself into another’s situation” (p. 6)
- “Imagining how another is thinking and feeling” (p. 7)
- “Imagining how one would think and feel in the other’s place” (p. 7)
- “Feeling distress at witnessing another person’s suffering” (p. 7)
- “Feeling for another person who is suffering.” (p. 8)

Evidently, there is much more to the term than it may at first seem. Subconsciously imitating someone’s behaviour, such as yawning (concept #2), feeling sympathy for someone’s loss (concept #3), feeling an inner discomfort, for example when watching a movie torture scene (concept #7), and trying to put yourself in someone else’s shoes (concept #6) are all ways to experience empathy. According to Gruen (2015), empathy can also be seen as a process:

The wellbeing of another grabs the empathizer's attention; then the empathizer reflectively imagines himself in the position of the other; and then he makes a judgment about how the conditions that the other finds herself in contributes to her state of mind or wellbeing. (p. 41)

As I will discuss later, some of these forms of empathy may be shared with other species while others may be human-specific.

Developmental Model of Empathy

Humans are thought to have differing capacities for empathy, notably based on age. Goleman (2006), who is well regarded for work on emotional intelligence, writes that the roots of empathy in humans can be traced to infancy. Babies learn about emotions through a process called attunement where mothers show they understand what the baby is feeling, which is reassuring for the baby. Repeated attunements reinforce for the infant that other people will share in and care about their feelings. Due to rapid brain development in the early years of life, Goleman (2006) also argues that there are critical learning periods for developing emotional intelligence.

Human empathy is thought to develop in stages during infancy and childhood (Hoffman, 2000). At first, young children have not yet developed their sense of self and identity but exhibit basic empathy. For example, babies often try to comfort another baby who is crying. This example and the discovery of “mirror neurons” in the 1990s are taken as evidence that humans are biologically hardwired for empathy (de Waal, 2010; Dolby, 2019). As children’s brains develop, they are increasingly able to engage in complex cognitive processes. They begin to understand that they are distinct individuals as they develop their sense of self, and gradually understand what someone else may feel like in a certain situation (Rifkin, 2009). They also can identify with the experiences and emotions of fictional characters, what Gruen (2015) describes as “storied empathy.” All these forms of cognitive empathy are very complex (Gruen, 2015).

Interestingly, there seems to be gender differences when it comes to empathy, both in children and adults (Angantyr et al., 2016; Bosacki & Tardif-Williams, 2019). De Waal (2010) explains:

The first sign of emotional contagion—one baby crying when it hears another baby cry—is already more typical of baby girls than baby boys. Later on we see more gender differences. Two-year-old girls witnessing others in distress treat them with more concern than do boys of the same age. And in adulthood, women report stronger empathetic reactions than men. (p. 67)

Gender differences are complex, however, and this does not indicate that one gender is “naturally” (i.e., biologically) more empathetic.

Empathy can certainly be taught and learned (Feshbach & Feshbach, 2009). For example, guided learning experiences have been shown to be successful in helping children develop their perspective-taking abilities, as seen in a study by Cigala et al. (2015) with children aged four to five. Some forms of training that have been found to be effective in increasing empathy skills include: learning to recognize emotional states in oneself and others; stressing similarity between oneself and others; role playing activities; training in perspective to see someone else’s viewpoint; observing misfortune of others; and modeling empathy behaviour (Feshbach & Feshbach, 2009).

There are various programs in Canada that aim to teach empathy or other related emotional intelligence skills to school-aged children, such as Second Step and the Learning to Care Curriculum (Feshbach & Feshbach, 2009). Another program is the Canadian “Roots of Empathy” program founded by Mary Gordon (2005), in which classes are matched with a local baby and parent to learn about the baby’s needs and development throughout the school year. Helping children develop empathy, Gordon writes, guides them towards becoming responsible adults who are not apathetic to the plight of others. Other programs push beyond the human such as those offered by humane educators to promote empathy with other animals (Jalongo, 2014).

Empathy in Other Species

There is a “growing recognition that animals have much greater intellectual and emotional capacity than science had previously acknowledged” (Dolby, 2019, p. 406). Much of this new information comes from the field of cognitive ethology that aims to understand what it is like to be an individual of another species and investigate what animals think and feel; other fields that also contribute to this knowledge include primatology, veterinary science, and anthrozoology (Dolby, 2019).

Whether other animals are capable of understanding what is in another’s mind has been the topic of debate for years, but especially since the 1970s. Monkeys and apes have demonstrated prosocial behaviours (that is, actions that benefit the group without personal gain), and apes, dolphins, and elephants have been shown to be capable of advanced empathy such as perspective-taking and targeted helping (de Waal, 2010). Pérez-Manrique and Gomila (2018), in their comprehensive review of studies looking at sympathetic concern and empathic perspective-taking in other animals, conclude that a:

... wide range of social species can perform sophisticated behaviours that calm, help or rescue other group members from distressing situations. These behaviours are related to the species’ behavioural ecology and may be simple, not involving empathy-based mechanisms, such as rescue behaviour in ants, or more complex behaviours requiring an emotional component and which, in turn, can be graded into different levels of complexity. (p. 266)

Therefore, many social animals, including insects, exhibit complex helping behaviours, but these are not always based on empathy (i.e., an emotional response).

Some animals such as primates, cetaceans, and dogs also have been seen to help unfamiliar individuals of their own or even other species (Jaasma et al., 2020). The common (and often anthropocentric) view today is that empathy is incremental, with some animals showing basic forms of empathy while more complex empathetic abilities are only found in “higher” species like chimpanzees (Lurz, 2011; Pérez-Manrique & Gomila, 2018). This position is reminiscent of the human developmental perspective that sees the possibility of empathy increase alongside cognitive development. Such claims are viewed with hesitation by some. Lurz (2011), in his book *Mindreading Animals: The Debate over What Animals Know about Other Minds*, argues that no current experimental approach is capable of determining whether animals can truly put themselves in another’s shoes to understand what another knows, sees, or hears because of the challenges of trying to understand animal minds. Similarly, Pérez-Manrique and Gomila (2018) note that “it is not easy to distinguish between the motivations and consequences of a behaviour in humans, [and] this task may be even harder in other animals” (p. 249) thus argue more research is needed.

I have briefly discussed the potential of empathy in nonhuman animal species, but what about other living creatures like plants? Can they think and feel? These questions have not been researched much, although a heated debate has flared up among scientists (Wohlleben, 2016). Wohlleben, in his popular book *The Hidden Life of Trees* (2016), shares an interesting perspective of how trees think, feel, and communicate in ways that usually go unnoticed since they are so different from human experiences. He reports that research indicates that trees communicate by “means of olfactory, visual, and electrical signals” (p. 12) and a group of trees can sense which individuals need resources most and nutrients and water are shared among a group of trees so that “each tree can grow into the best tree it can be” (p. 16). Although, the

majority of plant researchers agree that plants are unlikely to have what is popularly understood as intelligence, memory, and emotions, Wohllenben (2016) argues that plants are much more similar to animals than originally thought, with the distinction being only that one group can photosynthesize and the other eats other living beings.

Empathy in Environmental Education

Not only is empathy seen to be an important element of children's social-emotional development, but it has also been said to be a precursor to environmental consciousness (Rifkin, 2009). The need to understand others is also generally thought of as an integral part of sustainability education (Jensen, 2016). For these and other reasons outlined below, empathy has been examined by environmental education practitioners and researchers.

Sobel (1996), well known for his place-based education curriculum, felt that empathy development was key to that pedagogical approach. Thus, his curriculum for children aged four to seven centered on empathy, which he argued lays a foundation for later stages of environmental competency development. There remains, however, a lack of research that explores "the emotional dimensions of young children's encounters with nature" (Green, 2018, p. 19), including the role of empathy. An exception is a study conducted in Alberta by Cox et al. (2011) that looked at a place-based environmental program with extended outdoor experiences and its influence on kindergarten students' awareness of, and feelings of empathy toward, the environment. Results of the five-month study suggest that the program increased the children's empathy and awareness of the environment as well as their knowledge of the local environment.

The word "imagination" also often comes up in discussions of empathy (as illustrated in Batson's concept regarding imagining how another is thinking and feeling). Jensen (2016) takes this idea a step further, arguing that empathy in the context of sustainability education is an

imaginative act that has the potential to “bridge the spaces between the immediacy of the local self as learner, and global other” (p. 92). Her study points to the importance of using one’s imagination as a way of knowing and exploring what other beings feel and know. For example, Jensen describes an instance where a teacher showed students an image of a dead bird filled with plastic litter it had eaten to inspire meaningful connections to a learning unit about litter reduction. Another example of the potential role of imagination comes from Holm (2012) who analysed several fiction and non-fiction children’s books that contain stories of people displaying “environmental empathy in action.” He argues that such books can be an excellent springboard to discussion and may inspire children to become engaged with environmental issues.

Rifkin (2009), in his book *The Empathic Civilization: The Race to Global Consciousness in a World in Crisis*, suggests that “the most mature form of empathic response is the ability to experience an entire group of people or even other species as if their distress were one’s own” (p. 127). He discusses how human empathy has gradually been extended to new human groups (e.g., homosexuals, people with disabilities, women, etc.), and inspired by the animal rights movement, even beyond humans. In parallel to other fields in the social sciences that have taken this “animal turn,” environmental education is also embracing the potential of considering other animals (Dolby, 2019; Russell & Spanring, 2019). Speaking specifically about empathy, Dolby (2019) argues for the importance of focusing on animals in environmental education:

It is from this common ground of empathy that I suggest environmental education can move productively into the future, and can respond with hope to the challenges we must face together, challenges to the very existence of living beings. To do so involves looking beyond the established and accepted paradigms and approaches to environmental education, to explore linkages and possibilities coming from fields

in the natural sciences that are concerned with animal protection and animal rights.
(p. 411)

As I briefly noted above, humane education aims to foster empathy for other animals (Daly & Suggs, 2010; Jalongo, 2014). There have been a number of studies to assess effectiveness of activities designed to increase children's empathy for other animals (e.g., Angantyr et al., 2016; Burich & Williams, 2020; Daly & Suggs, 2010). For example, one study examined six- to 11-year old children's knowledge of animal welfare and perspectives of farm animals (Burich & Williams, 2020). The researchers found that regular contact with farm animals enhanced empathy. Children were shown to have many misconceptions about farm animals' lives including species-specific biology and needs, but they largely agreed that animals can experience emotions. During focus group discussions, the children mainly exhibited cognitive empathy and, in rare cases, affective empathy (Burich & Williams, 2020). Perhaps, then, the cognitive aspects of understanding others is an important foundation. As Gruen (2015) suggests, "it may seem nearly impossible to imagine understanding what a dairy cow or a lab rat or a captive chimpanzee might be thinking and feeling" (p. 83), which she calls "incomplete empathy" that she argues can be remedied by gaining knowledge.

Although the literature on empathy in environmental education is still limited, the authors cited in this section agree that empathy is worth investigating. Rifkin (2009) optimistically suggests that empathy will continue to expand as humans are increasingly exposed to other perspectives and ways of knowing through technology and globalization. Sideris (2011), who analyses the environmental messaging in the movie *Avatar*, writes:

I remain largely persuaded by those such as Rifkin who see education for empathy, with all its caveats, as part of the solution. I am particularly heartened by

environmental education for children that (explicitly or implicitly), incorporates empathic education. Many educators and environmentalists are returning to the idea that children need to form an emotional, visceral bond with the natural world and with nonhuman forms of life *before* learning the dispiriting details of the environmental crisis. (pp. 473-474)

Interspecies Empathy

While most empathic responses are seen to occur within a species (i.e., humans towards other humans, bonobos to other bonobos), researchers have recorded “countless examples of animals extending the empathic bond beyond their kind” (Rifkin, 2009, p. 98). Companion animals are a prime example. Companion animals are often considered part of a family social circle and family members have reported that their companion animals exhibit various emotions including fear, joy, and compassion (Su et al., 2018). When queried on their companion animals, children can describe in detail how the individual animal communicates (Selly, 2014). In fact, people who have had companion animals as a child have been shown to demonstrate greater empathy for animals in general as adults (Melson, 2001; Rothgerber & Mican, 2014). Selly (2014) suggests that “any time a child looks at the world through the eyes of an animal, she gets practice in empathy” (p. 46).

To explore questions of how well humans can see animals as they are and what animals perceive, Maoilearca (2019) shares a piece of an interspecies performance called *Sheep Pig Goat* in which human artistic performers worked alongside pigs, sheep, and goats. Maoilearca discusses the concept of “embodied empathy” by leaning on the work of Despret (2013) who defines embodied empathy as “feeling/seeing/thinking bodies undo and redo each other, reciprocally though not symmetrically, as partial perspectives that attune themselves to each

other” (p. 61). In this approach, empathy moves from a one-way projection to a continuous interspecies exchange. According to Maoilearca (2019):

... the notion of interspecies empathy is by no means straightforwardly celebrated.

It raises the charge (like empathy in general) of misguided identification and understanding and reinforcing an assumed capacity to access the minds of other animals or to adopt their viewpoints. In the particular case of animals, so the criticism goes, what is construed as interspecies empathy is in fact mere anthropomorphic projection. (p. E-19)

An example of possible projection can be seen in my own Master’s research when a young girl around four years of age was observing insects with me and a small group of other children. She exclaimed, “Some are happy, some are mad and some are crying!” (Boileau, 2011, p. 20). While not all anthropomorphizing is problematic (Gruen, 2015) – and in fact can be a useful educational tactic to enhance connectedness to nature (Tam et al., 2013) – it is not clear that the child in this example had much understanding of insects and likely was simply projecting human emotions.

De Waal (2010) suggests, “We can’t feel anything that happens outside of ourselves, but by unconsciously merging self and other, the other’s experiences echo within us” (p. 65). Intuitively, it may be easier for humans and other animals to identify and connect with those similar to us and perhaps most easily to those in our inner circle. De Waal (2010) observes that “identification is such a basic precondition for empathy that even mice show pain contagion only with their cage mates” (p. 80). Trying to understand what another being of another species may be thinking and feeling is extremely difficult, which means our empathy can be inaccurate in a variety of ways (Gruen, 2015). Here, shifting attitudes towards an approach that aims to learn

from animal others rather than trying to apply human standards and measures (Maoilearca, 2019) as well as using imagination as a way of knowing (Jensen, 2016) may be helpful.

It is also worth considering the possibilities of interspecies empathy beyond animals. Marder (2012) explores the concept and possibility of human empathy for plants, concluding that due to the ontology of plants, it is not possible for humans to have empathy for them. Indeed, Marder suggests that plants constitute the limit of our empathic reach. Marder argues that when humans try to empathize with plants, we necessarily come up short due to the inaccessibility of plant psyches, and thus we end up projecting our own emotions. Marder suggests that the possibility of empathy may increase when ontologies are more similar and that it may eventually even be possible to share an “ontological empathy” with beings where the ontological differences are great, but the empathy is based on a “sense of proximity to the *being* of other creatures ... Any future rapprochement between humans and other beings will unfold on the terrain of post-metaphysical philosophy, which will be exceptionally attentive to the ontological uniqueness of non-human existences” (p. 268). Marder’s thinking is in line with posthumanist notions of “becoming with” others (Haraway, 2016).

While common worlds researchers have not discussed empathy much to this point, the idea of mutual empathy occurring between humans and other species seems compatible with posthumanist thinking. While not labelling herself a posthumanist per se, Gruen (2015) offers an important insight. She explains that humans are already in many entangled relationships with other species and that our perceptions and actions make experiences better or worse for all. She argues that we should therefore seek to better understand these relationships and improve them. She proposes the term “entangled empathy” and describes it as “a process that involves integrating a range of thoughts and feelings to try to get an accurate take on the situation of

another and figure out what, if anything, we are called upon to do” (p. 77). Once we have honed this skill, Gruen argues that we can “empathetically engage with others with whom we don’t have direct contact as well as groups of unfamiliar individuals” (p. 77). For example, an experience with an individual of one species may lead to changed perceptions of and behaviour towards that whole species going forward. As well, in describing her idea of storied empathy Gruen (2015) suggests that the ability to empathize with fictional beings also suggests that narrative, storytelling, art, and literature may be useful for empathizing with the more-than-human world.

Empathy is a very broad topic that has been studied in a number of disciplines and fields including psychology, sociology, women’s studies, literature, and education. Empathy has garnered some attention in animal studies, humane education, and environmental education although not much as yet. Gruen’s ideas of “entangled empathy” resonates with posthumanist ideas and common worlds approaches so has the most relevance for my own dissertation research.

Conclusion

This literature review has covered a wide array of topics to provide an overview of the guiding theories, empirical studies, and intersecting fields of inquiry I have built upon in my dissertation research. I have discussed early childhood environmental education/early childhood education for sustainability, the child and nature movement, forest school pedagogy, and Indigenous perspectives. I also elaborated on how ideas about multispecies relations, connections to place as well as empathy relate to my research. There are, of course, many ideas and studies that have not been included in this literature review, which is always the case when a researcher makes decisions about what to include and exclude from review. My intent in this review is to

not only point to work that inspired my research but also to reveal research gaps and opportunities, some of which I have tried to fill in my exploration of child-nature interactions and relationships in Canadian forest school programs. Of note, numerous researchers in this field (e.g., Dernikos & Bhagwanji, 2019; Elliott & Davis, 2020; Malone, 2016; Pacini-Ketchabaw et al., 2016) appear to be eagerly moving towards a posthumanist framework and questioning long-standing underlying concepts such as the human/nature binary that have led Western society towards environmental degradation.

Chapter 3: Methodological Process

My research methodology for this study was multispecies ethnography. In this chapter I describe the ways in which I sought answers to my two research questions: How, if at all, do children empathize with the more-than-human world in a forest school setting? How might the forest school setting and pedagogy facilitate children’s affective and embodied connections with the natural world? I begin by briefly describing my chosen methodology. I then outline the research context, site description, data collection methods, analysis, and representation, ethical considerations, and limitations of this study.

Multispecies Ethnography

I begin this section with a quote that resonated with me as I was planning my research: “Putting posthuman theory to work is both exciting and daunting” (Taylor, 2016, p. 6). Investigating child-nature relations and children’s experiences with the more-than-human world in the context of forest school pedagogy through a posthumanist and common worlds lens was indeed exciting yet daunting. Posthumanist, common worlds research is much less straightforward than more traditional qualitative research methodologies given fundamental assumptions that typically guide education research are being questioned (Taylor, 2017). Posthumanism requires a shift in perspective that affects all stages of the research process. Posthumanist research thus has “radically shifted what is possible in research methodology” (Ulmer, 2017, p. 832), including in early childhood research. Weldemarian (2017) advocates for “broader methodological perspectives that can overcome the methodological individualism that underlies many of the approaches to sustainability in early childhood, aiming towards more inclusive and alternative ways of understanding that are typically absent in ECEfS discourses” (p. 117). In this section I describe the research methodology best suited to this study –

multispecies ethnography – including a description of foundational concepts and methodological challenges. I end with a brief discussion of other methodological inspirations that also guided this study.

Foundational Concepts

First, this study's methodology rests on certain onto-epistemological assumptions. I see myself as part of the part of the natural world, continually intra-acting with materials, forces, and other beings around me. These encounters shape me, as well as the world, in a mutual becoming with others. I view children as complete human beings also co-constructing the world as they touch, move, think, and feel with others, living and non-living. Children are agentic and entangled among a plethora of relationships (Gruen, 2015; Harwood, in press).

Though primarily focusing on a posthumanist lens for this study and attempting to decenter the human as much as possible, I intentionally also included some rather humanist reflections. As Stables (2020) explains, humanism is not inherently bad when it comes to considering human-nature relations and human impact on the environment. He argues that it is possible in humanism to be “deeply responsive to ecological and environmental issues” (p. 896) provided one is ultimately concerned with respecting nonhuman nature, something to which I have been committed throughout this dissertation. I do reject discriminatory humanist dichotomies, for example, taking a position that understands humans as distinct from and inherently more important than other species or that frames a child as only fragile and innocent (Murriss, 2016), but nonetheless I do focus occasionally on the children in my study as they are indeed members of the multispecies community within which I was enmeshed and attending to their experiences at times helped me grapple with my research questions.

Multispecies ethnography is a form of ethnographic research. This broader methodology can be defined as a “research design used to describe and characterize the behavior and identity of a group or culture” (Privitera & Ahlgrim-Delzell, 2018, p. 300). Most ethnographic research focuses on people, whether in personal accounts (e.g., autoethnography) or the more common collective accounts (Parker-Jenkins, 2018). This methodology has been around for over a century and was foundational to research in social and cultural anthropology (Smart & Smart, 2017). Originally, animals and plants were “central elements of ethnographic research, when cattle, coral gardens, rice cultivation, and so on were thoroughly embedded and attended to in almost every major anthropological monograph” (Smart, 2014, p. 4). However, along with modernism came a greater emphasis on the human aspect, even eliminating animals from anthropological studies altogether until fairly recently (Smart, 2014).

Ethnographic research is one of the five primary qualitative methodologies described by Creswell (2013). He notes that ethnography:

Involves extended observations of the group, most often through *participant observation*, in which the researcher is *immersed* in the day-to-day lives of the people and observes and interviews the group participants. Ethnographers study the meaning of the behavior, the language, and the interaction among members of the culture-sharing group. (p. 90, emphasis in original)

Ethnographic researchers, through extensive fieldwork, typically collect various types of data, analyse it to draw out patterns and themes, and may ultimately “forge a working set of rules or generalizations as to how the culture-sharing group works as the final product of analysis” (Creswell, 2013, p. 96).

There are various forms of ethnography such as realist ethnography and critical ethnography described by Creswell (2013). More recently, several new forms of ethnographic research have been developed, for example, sensory ethnography (Pink, 2015) and multispecies ethnography (Kirksey & Helmreich, 2010). The latter, which I will focus on, has been defined as:

... a term that situates itself at the juncture between biological, cultural and political modes of analysis; multispecies scholarship has become a significant new wave of scholarship addressing human interactions with animals, plants and other life forms in what scholars once unproblematically called “nature” or “the natural world.”

(Aisher & Damodaran, 2016, p. 294)

Ogden et al. (2013), in their review paper on multispecies ethnography, define it as “ethnographic research and writing that is attuned to life’s emergence within a shifting assemblage of agential beings” (p. 6). Noting how this “reconsideration of the human represents a profound epistemic shift in the humanities and social sciences” (p. 7), multispecies ethnographies explore not only the interactional encounters between humans and nonhumans but also the ways in which human lives and cultures are enmeshed (Aisher & Damodaran, 2016).

Think, for example, of observing children playing hide-and-seek in the forest. Focusing on much more than the children’s physicality and imaginative play, a multispecies ethnographic account might include a description of the lives of the other species present such as the trees, insects, and fungi since all of these, together and assembled in particular ways, create the experience. Further, all of this is happening in a broader context hence, as Kirksey and Helmreich (2010) suggest, “multispecies ethnography [also] centers on how a multitude of

organisms' livelihoods shape and are shaped by political, economic, and cultural forces" (p. 545).

Using various methods such as those used in traditional ethnographic research, the key difference is a shift of focus away from solely the human component of research to include nonhuman elements. As Ogden et al., (2013) write,

Multispecies ethnography is marked by its attentiveness to nonhuman agency—stones, plants, birds, and bees have the power to transform the world in this work. This can be followed down to the microbial world that collectively (by the billions) constitute both animals and humans. (p. 16)

The notion that nonhumans have agency or intent is therefore central to the theoretical perspective of multispecies ethnography. Parathian et al. (2018), in their glossary of terms used in different fields of study that examine human-nature relations, defines agency/intent as “having an independent capability or ability to act on one’s will. The capacity of individuals to make their own free choices and their reasons for acting are affected by cognitive belief structures that form through experiences, and societal/individual perceptions” (p. 767). Thus, in the previous example of children playing in the forest, the other living creatures are seen to have agency, which means they are part of reciprocal relationships. The children as well as the trees and forest animals have agency to affect each other in various ways and all these beings are mutually entangled in their experience of the world.

Schroer (2021) discusses the concept of “umwelt “and its application in multispecies research today. First proposed in the 1920s by von Uexküll, an Estonian biologist, umwelt literally translates to “surrounding world” (Shroer, 2021, p. 132) and alludes to an acknowledgement that others, including nonhumans, have a subjective perception of the world.

At the time, this went against the grain of a very humancentric scientific approach. Schroer reports:

[von] Uexküll also argued against the assumption of a hierarchical order of life by which living creatures can be ranked from lowest, or least complex, to highest, or most complex. [von] Uexküll, by contrast, saw life as being stretched out in a large interconnected web in which one could find a multitude of various organisms' perceptual worlds. He argued that all animals – no matter how simple or complex – had to be understood as subjects that actively interpret signs in their environments through their species-specific perceptual abilities and potential activities. (p. 137)

Although this work has not been cited much within multispecies or common worlds educational research (for an exception in environmental education, see Bell & Russell, 2000), it is very relevant. A human umwelt is one among many. While a human can never directly know about the subjective world of another human, let alone another being, we can use our imagination, aided by observations of other beings' behaviours and activities (Schroer, 2021).

Multispecies ethnography focuses on human relations with other living beings, yet it is not the only approach with that purpose. Many researchers have been moving toward this blending of the social and natural sciences. For example, ethnobiology can be described as the “the study of how people from different cultures conceptualize, represent, use, and manage their knowledge of environments and living organisms” (Parathian et al., 2018, p. 753); “anthrozoology draws from various disciplines including anthropology, psychology, and zoology to examine human–animal relationships in relation to animal representations, symbols, and stories, and their physical presence in human societies” (Parathian et al., 2018, p. 753); and

“ethnoethology explores the methodological overlap of ethnology and ethology, examining the characteristics of different peoples and their relationships with animals and ecosystems”

(Parathian et al., 2018, p. 753).

At a recent symposium at an anthrozoology conference, for example, several multispecies ethnographic studies were presented. The foci of some of these studies were: tree beekeeping and human heritage studies (Echaust, 2021), dog training programs in the UK (Charles et al., 2021), and dog-human relationships in K-9 search and rescue teams (Griffin, 2021). All these studies focused on both humans and other animals. Multispecies ethnographies have also increasingly been conducted in the fields of environmental conservation (e.g., Aisher & Damodaran, 2016), anthropology (e.g., Kirksey & Helmreich, 2010; Swanson, 2017) and, most relevant to my study, education (e.g., Lloro-Bidart, 2018). Lloro-Bidart (2018) provides an overview of multispecies ethnographic research in education and notes that two broad trends have emerged:

(a) research in childhood studies and environmental education that works with [feminist] new materialisms, posthumanism, and/or other approaches in a *common world* framework ... and (b) research that emphasizes a critical animal studies approach, but also engages [feminist] new materialisms or posthumanism to develop critical posthumanist or critical feminist posthumanist theories. (p.

256)

My research is situated within the first strand Lloro-Bidart identifies, as have other common world and/or posthumanist researchers who have conducted multispecies ethnographies (e.g., Lloro-Bidart, 2018; Pacini-Ketchabaw & Nxumalo, 2015; Pacini-Ketchabaw et al., 2016; Taylor & Pacini-Ketchabaw, 2015; Vladimirova & Rautio, 2020).

Challenges

I highlight here three primary challenges of applying multispecies ethnography as a methodology for a dissertation study such as my own: the extensive length of time required to conduct ethnographic research and the challenge of narrative writing of findings; the interdisciplinary difficulties of combining social and natural sciences; and the limitations of the term “species” itself presents in understanding human relations with other beings. I identified ways to address each of these, which I describe below.

First, although ethnographic research traditionally takes place over long periods in the field, Parker-Jenkins (2018) argues that data collection tools such as video and audio recording have greatly modified the amount of time required for a researcher to reach a data saturation point. She argues that ethnographic research can now take place over much shorter periods. Indeed, collecting video documentation for a whole year would yield an unmanageable amount of data to then analyse. Creswell (2013), upon outlining the challenges of conducting ethnographic research, writes: ‘in much ethnography, the narratives are written in a literary, almost storytelling approach, an approach that may limit the audience for the work and may be challenging for authors accustomed to traditional approaches to scientific writing’ (p. 96). I suspect this would be particularly so for researchers coming from fields such as biology or ecology. Researchers such as myself, who have experience in the field of early childhood education, where it is common practice to document and write stories about children’s play and learning, may find it a more natural fit, which in the end I did.

Second, it has been noted that conducting interdisciplinary work can be a challenge in itself since:

... academic researchers are usually trained in traditional disciplines and may lack the tools or willingness to make bridges between fields. They may have differing theories of knowledge, including their philosophies, worldviews, and epistemologies, which can lead to incompatible ways of perceiving human–wildlife interactions or approaching research into these phenomena. (Parathian et al, 2018, p. 755)

Here, creativity and open-mindedness may be helpful, as well as looking to other disciplines that are relevant to the research context. As an example, Parathian (2018) notes that increasingly, biologists are seeking qualitative nuances in their studies and social scientists are seeking quantitative data on the nonhuman agents in theirs.

Lastly, it can be challenging to work with the idea of species and the boundaries it creates when in fact living organisms co-create and live with each other (Smart & Smart, 2017). For example, Ogden et al. note that “being uniquely human is being a microbiome, or part of a teeming colony of germs” (p. 14), which illuminates the grey area between the beginning and end of one species. Hird (2010) examines this idea in her article, “Meeting with the Microcosmos” where she extends Haraway’s notions of “species meeting” to include bacteria, noting that “any given human/animal body is a symbiont: 600 species of bacteria in our mouths and 400 species of bacteria in our guts, and the countless more bacteria that inhabit our orifices and skin” (p. 37). Hird (2010) reminds us that we can easily lose sight of this rich diversity within us when we focus too much on our humanity and even on ourselves as large animals. Further, Schroer (2021) writes that living beings are most often interpreted in terms of the idea of species-specific bodies “that are seen as the loci of specific meaning making” (p. 147) and that researchers should address how meaningful relationships can occur beyond species lines. While

an important consideration, I decided that because most biological and ecological research has been conducted and written on the basis of species classification, I would maintain a more traditional approach to the concept of species, which was pragmatically beneficial in that it allowed me to consult relevant research on specific species who became part of the study.

Other Methodological Inspirations

I was also inspired by other methodological approaches and blended them into my research process. Sensory ethnography was a useful approach since children's outdoor learning is heavily connected to their sensory experiences. Outside, children hear birds signing, smell plants, feel the earth and the different temperatures, and so on. Indeed, their senses are foundational to their learning experiences. Sanderud (2020) describes sensory ethnography as a way:

... of doing ethnography that takes into account the experience, perception, knowing and practice of both participant and researcher. Thus, it refers to a broad spectrum of qualitative approaches. In short, the aim of sensory ethnography is to understand and describe what it “feels” like for informants to dwell in certain places in certain situations. (p. 114)

Waite and Waters (2020) also discuss how important sensorial experiences in natural environments are to children and young people as they “construct meaning using all the senses: touch, smell, taste, sight and hearing” (p. 78). They suggest that it is necessary to select research methods that appropriately capture this multisensorial experience. I agree with their assertion that research taking place in an outdoor context is inherently unpredictable and that a range of research methods can therefore be helpful.

Another inspiration came from reading Olive's (2020) writing on the importance of reflexivity in research; I immediately felt this was important in my situation as well. She writes that "reflexivity helps us remain engaged with our subjective assumptions and experiences, and negotiate how the experiences, ideas, conversations, theories we have gathered through our research have all folded into and through us" (p. 123). This study, being qualitative and interpretivist in nature, is led by my own experiences, analytic process, and reflections, thus it seems crucial to be as self-aware as possible and to query how I might be impacting the study. Olive argues that reflexivity is useful at all stages of the research process and suggests writing in a reflective journal as a form of praxis to help the researcher think things through. Further, I was intrigued by how Olive (2020), who conducted research on women's recreational surfing, went surfing herself throughout the research process to share the experience with the participants so that "these experiences become something mutual, rather than something they describe" (p. 125). I similarly was inspired to share a lived experience of being at the park, both while the children were there and when they were not, feeling the snow, sun, rain, getting dirty, and seeing the park wildlife for myself. My own experiences, although unique to me, informed my general perception of the events I documented.

With these various methodological lenses in mind, I selected several research methods to explore my research questions. In the next sections, I will describe the research context (including what it was like researching during a worldwide pandemic), after which I will describe each research method in more detail.

Research Context

As I was preparing my research proposal for this study, the COVID-19 pandemic started. Impacts were felt throughout Canada and the world for most of 2020 and have continued to the

present in 2022. Many childcare centres, schools, and outdoor programs were closed completely for months. Lockdowns were in place in parts of Canada for weeks and months in an effort to lessen the number of infections and deaths. Working with emerging guidelines developed by Lakehead University and federal/provincial health and safety regulations, I modified my initial recruitment process plan to ensure the safety of everyone involved by, for example, wearing a mask and abiding by social distancing protocols when initially discussing the study with educators and parents. The data collection methods also had to be modified to ensure the safety and health of me, the participants, and their families. Therefore, what ultimately unfolded in the field is the result of a pre-pandemic research plan that then had to be adapted to meet health and safety requirements.

As I will describe more fully later, certain changes could easily be made, while others were emergent and unexpected, such as having to stop in-person observations in the middle of my data collection activities. In the end, the multi-modal plan I already had in place for collecting data and the collaborative approach I had built with the forest school director and educator nonetheless allowed for a thorough and thoughtful multispecies ethnography to take place regardless of the pandemic restrictions. In the remaining sections outlining the details of my methods, rather than simply describing what happened as if that was what I had planned all along, I will note when modifications were made to my original plans due to COVID-19 restrictions as that was an important part of my research process. Honestly reporting on the messiness that ensued rather than smoothing it over also fits well with my theoretical framework.

Site Selection

My research was conducted in Alberta, Canada, where I lived at the time. While I had a preferred site in mind before I began my research, I could not guarantee that site would be

amenable to participation in my study, so I needed to think broadly about possibilities at the outset. There are several outdoor programs and forest schools in Alberta, notably in the larger centres. Thus, I had set the following criteria for selecting a study site:

- a forest school program that runs for at least 6 weeks for the same children and in the same location;
- be geographically accessible to me (i.e., by foot, public transit, or reasonable driving distance);
- allows me to spend at least a half day per week for 10-12 weeks at the site.
- operates as a recreational or private program and is not part of any school board
- program takes place mainly or entirely outdoors (i.e., no indoor research site).

The site that was ultimately selected is a forest school program where I had worked and volunteered over the last two years. I had an existing relationship with the director and educator, thus I invited them to participate after my dissertation proposal and ethics application had been approved. The program director was very interested in my study and agreed to support my research. Had she not agreed, I had planned to put out a broader call for research sites by contacting other programs, but this proved not to be necessary.

Participants and Consent

I provided the program director, Lilith³ with an information letter outlining the details of the study (see Appendix A) and a consent form for her to sign (see Appendix B). She suggested that I work with a specific group scheduled on Friday mornings for 2.5 hours each week. In the fall of 2020, when I collected data, the Friday class consisted of six children led by one teacher,

³ All human participant names are pseudonyms.

Jackie. (In January, this program expanded to two teachers for a group of 10 children but I was no longer collecting observational data with the group then.)

I had an initial conversation with Lilith who provided feedback on my draft letter of information and consent form for the parents, which I gratefully incorporated. I then again approached the primary educator, Jackie, this time more formally, providing the letter of information and consent form (see Appendices C and D). I also drafted an email to the parents/guardians of children in the Friday class, which the director forwarded on my behalf. It contained a letter of information and consent forms (see Appendices E and F) for them to sign and submit to me if they wished to participate in the study. Having not received all signed consent forms promptly, I coordinated a day to be physically present at the drop-off time so that I could meet the parents, answer questions, and collect any hard copies of the consent form. Parents of all six children involved in the Friday program agreed to participate.

On the first day I hoped to collect data, the children themselves were then informed about the study in person in age-appropriate language and asked if they would like to participate, through an oral assent process (see Appendix G). All six children consented to be part of the study. I also continued to seek informed and ongoing consent from the children throughout fieldwork, for example by asking, “Would it be okay if I take a picture of you?” or “Who would like to wear the Go-Pro today?” After the start of the study, I was informed that a new educator, Mary, would be present on one of the planned observation days, for training purposes. Thus, I invited her to participate in the study, and simultaneously prepared to eliminate that day of observation should consent, not be granted. Mary also agreed to participate. Table 1 describes the people involved in my study.

Table 1*List of human research participants*

Type of participant	Name
Program Director	Lilith
Educator	Jackie
Educator (only present on one day)	Mary
Child	Charles
Child	Sean
Child	Julie
Child	Oliver
Child	George
Child	Joe

There was a myriad of other participants in this study, namely non-humans and objects, with the most frequent participants being dogs, trees and branches, grass, snow, GoPro cameras, birds, and the play and learning materials brought to the site. Throughout the study, participants changed depending on the day and the weather conditions, as I will explain in later sections.

Site History and Description

The forest school program that was the focus of my research takes place in a city park, which is located on Treaty 7 territory, the traditional land of several Indigenous peoples: the Blackfoot Confederacy (Siksika, Kainai, Piikani), the Tsuut'ina, the Stoney Nakoda Nations, and the Métis Nation (Region 3). The park contains a paved path and several smaller trails along a slope. In terms of the vegetation and plant species found at this park, they are described as follows:

Along the bluff, there are willows, ashes, Balsam Poplar, White Spruce and, at the base, the introduced Colorado Blue Spruce. The bluff is mainly glacial till covered

by a mixture of native and introduced grasses such as Created Wheat-grass and Awnless Brome. Due to the location, there are numerous introduced exotic species. One of the most prominent exotics is the Siberian Pea Shrub, better known as Caragana. This plant was imported because it could withstand the cold, dry Canadian prairies. (City of Calgary, n.d.-b, para. 6)

Animals that can be found at the park include various species of birds that inhabit urban areas, such as black-billed magpies, northern flickers, black-capped chickadees, and sparrows, as well as eastern grey squirrels, a plethora of insects, and occasional visitors such as raptors, bobcats, and coyotes.

The natural bluff was historically used as a buffalo jump by Indigenous Peoples (City of Calgary, n.d.-a). Today, the park is very busy with an “extremely high volume of commuters, joggers and dog walkers using the lateral pathways and trails” (City of Calgary, n.d.-b, para. 4). Only two percent of the population of the neighbourhood today identifies as Aboriginal according to the 2016 Canadian census, which is lower than the city average (City of Calgary, n.d.-c).

The children attending the forest school program are dropped off and picked up at the entry to the park. From there, the educator and students walk to various places in the park, which is located on a fairly steep inclination on a natural bluff and is home to a popular off-leash dog park containing several walking trails. There is an indoor site available to the group if extreme weather conditions present themselves, however, in all the days of data collection and the subsequent three weeks that I worked as a supply teacher during cold winter days in January, the indoor location was not used and the groups were outside 100% of the time.

Pedagogical Approach

There were several main activities or experiences offered to the children as part of their 2.5-hour forest school session on Fridays. The children participated in a variety of activities: a short hike of around 500 metres to locations within the park, two or three physical challenges led by the teacher, a snack while the teacher read a book, opportunities for tool use or crafting, free play time that could last for around half of the program, and then occasionally a quiet activity to end the session. As the lead teacher, Jackie planned the program based on the children's interests. Each week had a certain flow and intention, which then created space for children's engagements with the more-than-human world. Play was central to the program, which is typical of forest school pedagogy (Knight, 2013a).

Data Collection

Selecting methods for this study involved a search for methods used by others conducting multispecies ethnography as well as other researchers working within posthumanist-inspired studies, outdoor/environmental education studies, and research with young children. Methods for conducting a posthumanist, common worlds multispecies ethnography such as mine are neither well-defined or described in the literature nor straightforward. I decided that the methods best suited to my study were methods that captured a variety of perspectives, that took into account the mobile nature of outdoor programs with young children, and that captured multisensory and embodied connections between humans and the natural world. I wanted observations for this study to include a variety of perspectives: my perspective as a researcher (via non-participant and participant field observations); the children's perspectives (via chest-mounted action cameras); and the educator's perspective (via an interview conducted online). In this way I would be able to experience, reflect upon, and engage with data according to my theoretical grounding. For

example, viewing video footage captured by GoPro cameras helped dislodge, as Caton and Hackett (2019) suggest, “the spectator from their adult-centric viewpoint of the world” (p. 369), and spending time in the park without children allowed me to focus on the diversity of nonhuman beings at the park. Here I will describe these data collection methods in more detail.

GoPro Footage and Other Audio-Visual Documentation

GoPro cameras are small, lightweight, waterproof cameras that can be mounted or worn in various ways for action filming. They have recently been used in several studies with young children (e.g., Burbank et al., 2018; Green, 2016b; Harwood et al. 2019; Hov & Neegaard, 2020; Lloyd, Gray, & Truong, 2018) due to their ability to show a child’s perspective. Further, as Harwood and Collier (2019) note, watching GoPro footage captured by children allows the researcher to attend to the assemblage of materials and objects present at a study site and to think differently since the child’s body does not figure in the video, other than maybe a hand or leg, so the viewer’s gaze is drawn to other sights and sounds. They suggest, then, that this type of data allows “viewers to gain insight into experiences and also highlights, visually, aspects such as speed, movement, framing, sound, and the material elements captured by the wearer ...[yet] each angle, each event, each perspective is always partial and a particular framing” (p. 54). In this way, the use of GoPro cameras can facilitate a disruption of the typical anthropocentric lens in research.

I used the Hero 7 Black model GoPro with the Junior Chesty harness. The camera weighs 116 g and measures 6.2 cm X 4.5 cm X 3.3 cm. It is waterproof, rugged, and records video and audio, and also can be used to take photographs. These cameras are particularly convenient for use with young children as their “level of activity is high, and it might be difficult to keep track of the children outdoors” (Hov & Neegaard, 2020, p. 6).

Echoing what other researchers have done, in my study the children got to decide when they would like to wear the chest-mounted camera and were able to turn it on and off on their own. Children were asked at the beginning of each Friday class if they would like to wear a camera that day. I had two cameras on chest-harnesses available, and these were both used on each day of data collection over the nine-week period. Due to the limited battery life of the camera, the Digipower Re-Fuel Action Pack 9 hour extended battery was also used; however, on the last days, the battery extender was removed for the children's comfort since it made the camera considerably bulkier.

The children wore the cameras for nine days in total, although I was only present for the first five, because of the pandemic since I was required by the research office to stop attending the program in person outside. At this point, Jackie (the educator) agreed to help me collect data, so I dropped off the cameras for her immediately before the program started and collected them afterwards, not making physical contact. In total, 14.25 hours of GoPro footage was taken by the children. Although GoPro footage was the primary audio-visual method used to collect data, when possible, I also took photographs and short videos on my own hand-held digital camera. All audio-visual footage was initially viewed within a week of recording to make sure that the technology was working and to get a sense of emerging insights.

Non-participant Observation of the Forest School Program

Participant observation is typically considered the core activity in ethnographic research (Emerson et al., 2001; Greig et al., 2007) and, in the early childhood context, is “one way for researchers to immerse themselves in young children's worlds” (A. Clark, 2011, p. 312).

Creswell (2013) explains that a researcher can be involved as an observer to various degrees: as a complete participant, a participant as observer, a non-participant/observer as participant, or

complete observer. Although I had originally planned on observing children by actively participating in the program, COVID-19 safety precautions meant that I could only observe the children from a distance. I thus switched to non-participant observation, where I was “an outsider of the group under study, watching and taking field notes from a distance” (p. 167). I stayed at least two metres away from the group when possible and wore a mask if I was closer, such as while walking with the group along a footpath. This sometimes felt awkward and unnatural, but I came to realize that being removed from the group actually allowed me space for more reflection and observation of the park wildlife. In line with a posthumanist approach, de-centering the children’s actions in this way proved to be surprisingly useful. I observed the group for five weeks, starting on October 23, 2020. In late November, I received a notice from the Lakehead REB that I could no longer conduct in-person observations with human participants, therefore I was unable to accompany the group for the remaining weeks.

While with the group, I jotted down notes using a notebook with all-weather paper, and an all-weather pen to ensure I could write even if it was raining or snowing and that my notes would remain intact if they got wet. Writing notes down in front of participants can seem intrusive (Emerson et al, 2011) and can sometimes disrupt children’s normal behaviours, drawing their attention away from their activities (C. Clark, 2011); however, with me being mainly at a distance, my note-taking did not appear to disturb the children. Sanderud (2020) suggests that “a researcher’s own sensory experiences can enrich our understanding of children’s play in a natural environment” (p. 112), thus I also noted my own experiences and how I felt. Following each observation day, I transcribed my hand-written jottings into more formal notes (Yin, 2018), adding any additional detail while it was fresh in my mind. I also included memos and ideas into my typed notes.

Observations at the Park

In addition to observing the human participants, in accordance with my methodology, I was an observer of the non-human participants of this common world, such as soil, trees, birds, weather, and human-made materials. This data collection method was less straightforward and emerged throughout the research process. At the start of the data collection phase, I started reading *What the Robin Knows* by Young and Gardoqui (2013). This reading was intended to provide me with more information about the birds that I might encounter during the study, but it had a much more profound impact on me as a multispecies ethnographer. Young describes a way to become more attuned to a natural environment by spending time in what he calls “sit spots.” As I had already planned on spending time at the park outside of the forest school program times, this provided the perfect method for facilitating these observations.

Sit spots are widely used in the field of environmental education, some inspired by Young’s teaching (e.g., Sierra Club BC, n.d.; Young et al., 2010; Wildsight, n.d.). I found Young’s approach particularly insightful for facilitating an understanding of “bird culture,” reminiscent of the way an anthropologist might study human culture. Thus, this approach is more than bird *watching*, it is developing an understanding of bird *language*:

If we’re in bird language mode, however, we’re moving with a whole different frame of mind and venturing into another realm of awareness and intention and curiosity. We’re holding multiple questions in mind simultaneously. We’re not focused on a single species. We’re monitoring several species consciously and perhaps quite a few others unconsciously. We don’t have “hunting” intentions. We have diffuse awareness, curiosity, perceptions, and questions. (Young & Gardoqui, 2013, p. xviii)

This method of data collection became my primary method for observing the more-than-human. I picked sit spots in and around the regular locations used by the forest school program and immersed myself in the regular happenings at the park when the forest school group was not present. I usually stayed in my spot for around 30-40 minutes. When I was unable to continue accompanying the forest school group on Fridays, I still spent time at the park those days but in a different location to maintain some sense of connection with the group and share the experience of being at the park that day.

I wrote my sit spot field notes in the same journal I used to write observations during the program. These notes were far different as they focused on birds, squirrels, dogs, interesting sounds, sensations, and my own general experience. I saw each individual as a being with agency, and I wondered what the animals were doing, and why, and what messages they might be communicating. I reflected on plants surviving through the cold season and empathized, on very cold days, with animals who were also out on that day without a warm shelter (which admittedly involved me anthropomorphizing but enabled me to connect myself to the experience of nonhuman others). I supplemented this data with research on specific species, weather, and other relevant topics as they came up, which I compiled in a separate digital document. My intention was to gain further insight and understanding so that my observations would improve over time.

Educator Interview

One final method of data collection was employed. Although I had not planned initially on interviewing Jackie, changes in my research plan due to COVID-19 and her clear interest in the study led to an opportunity for me to gain her perspective on my preliminary findings, which proved most valuable. I conducted a semi-structured interview with Jackie online using Zoom on

December 11, 2020. Prior to the interview, I provided Jackie with the list of questions, which were all open-ended and guided by my observations to date. The interview lasted 50 minutes. It was recorded and thereafter transcribed into text for ease of analysis using the software Descript. This data collection method was humanist as it focused on the educator's observations and reflections, but was helpful as I sought further insight into children's experiences and relations with the land, weather, and nonhuman beings.

Research Journal

I also kept a typed research journal that allowed me to jot down reflections and ideas throughout the data collection and analysis process. I wrote 22 entries that discussed my decision-making process, reflections on my own experiences, possible codes, themes, and dissertation sections, methodological challenges, and my general thoughts on the study. I also wrote an additional entry following three weeks of supply teaching at the forest school after the data collection period, which provided me with a different perspective on the forest school experience.

Ethical Considerations

Several steps were undertaken to meet ethical standards. First, I complied with Lakehead University's Research Ethics Board requirements, which included obtaining written consent from the program director, the educators, and parents, and oral assent from the children. There were also additional ethical considerations due to the COVID-19 pandemic. Lakehead University's REB procedure required me to note all my close personal contacts during the study – I logged this information in a spreadsheet. I also got tested for COVID-19 twice during the data collection period. Although this was not required, it gave me peace of mind since the results were negative both times. I also completed a provincial government self-assessment of

symptoms before each Friday class and planned on staying home if I needed to (which did not happen). As per the REB requirements, I also wore a mask/face covering when I was near participants, maintained social distancing when possible, and regularly sanitized my hands and the GoPro cameras. When, five weeks into the study, the pandemic situation worsened in various parts of the country, I was required to stop conducting in-person fieldwork altogether, therefore, as noted above, I needed to make some adjustments to my approach to ensure the utmost safety of myself and the study participants.

Considerations of the non-human study participants were also important to me even if they were not required through the REB. There are few existing guidelines for ethically including non-humans in the literature, especially in terms of "wild" animals in a park that are not under the care and control of humans, but ethical matters related to including other animals in social science research is increasingly being discussed (Van Patter & Blattner, 2020). I followed Van Patter and Blattner (2020)'s three main principles for including non-human animals in research ethics: non-maleficence (i.e., care should be taken to do no harm to the animals); beneficence (i.e., the individual animals should directly benefit from the research); and voluntary participation. I attempted to operationalize these principles in various ways in my study.

When present with the group, I monitored the children for any destructive behaviours towards the natural world. Since a general framework of respect for the local ecosystem (including individual non-human animals and plants) is built into the forest school educational approach, it was not necessary for me to step in at any point. In terms of beneficence, I picked up trash at the park, whether with or without the children, and generally was respectful of the land and living creatures. Picking up trash once did cause me some inner conflict when I encountered

a group of magpies fighting over a plastic coffee creamer that they were feeding on (which I will discuss in Chapter 4). I also created 19 entries in the iNaturalist (www.inaturalist.org) database, which involved uploading pictures, with a possible species identification, linked to a map location. Since identifications on iNaturalist are confirmed by experts, this both helped me to accurately represent the living beings in my study and contributed information to this citizen science project that supports research and conservation. Finally, I was unable to obtain voluntary participation of the more-than-human participants, but my observations were naturalistic and therefore not disruptive. The children had few direct tactile encounters with non-human animals, and any bending or breaking of trees and branches was typically addressed by the educator.

As mentioned earlier in a footnote, I used pseudonyms for the educators and the children. Any photographs included in this dissertation are only of children whose parents/guardians approved such use. Jackie, the primary educator, as well another educator Mary who was only there on one day, consented to their appearing in photographs. Further, in line with the literature on using GoPro cameras for research with children, I ensured that children always had a choice to wear the camera or not, that they could turn it off or on themselves, and that they were comfortable (Lloyd, Gray, & Truong, 2018). Although I could not be present for four of the days that the cameras were used because of COVID restrictions, the educator replicated my approach and I was sometimes able to have brief, socially distanced discussions with her about using the cameras when I dropped them off or picked them up.

In terms of including children in the research process, my approach was situated in the middle of the continuum created by Green (2015). I did not simply conduct research *on* children, nor did I include them as co-researchers. The study was conducted in collaboration *with* the children since it was adult-led and interpreted but I paid careful attention to understanding

children's perspectives, and applied principles of children's rights to their participation. As two of the children were very keen to wear the cameras and did seem to understand the purpose – for example, in one video, I heard one child explaining to others that I would be watching the videos later on my computer – I felt they enjoyed wearing the cameras.

Finally, reciprocity was an important component of this research process. As previously mentioned, reciprocity with the more-than-human world was provided through general respect for the land, clearing trash, and contributing to a citizen science project. For the educator, Jackie, a relationship of mutual benefit was established through sharing a selection of video clips from the GoPro cameras (in a private online folder), which she found useful for planning purposes. She noted that these clips were particularly eye-opening since she was not able to observe all children simultaneously or get insight into their pretend play when the group was at a distance and out of earshot. In terms of reciprocity with the parents and children, following the end of the data collection period, I created a compilation video containing a selection of video clips from various days and uploaded it as an unlisted YouTube video. The link was sent to the parents and children so that they would be able to watch these highlights from the footage. A few months later, I removed it from YouTube to ensure participant privacy; the parents were aware that the video would only be available for a limited time.

Data Analysis

To explore the two main research questions guiding this study (*How, if at all, do children empathize with the more-than-human world in a forest school setting? How might the forest school setting and pedagogy facilitate children's affective and embodied connections with the natural world?*), I analyzed my data in various ways. Although it has been argued that posthumanist data analysis should move away from coding due to its humanist nature (Jackson,

2013), I still found coding to be a useful tool in initially organizing the data and achieving some clarity. Perhaps my hesitancy to forego coding altogether reflects my relative inexperience as a researcher or perhaps it reflects one of the challenges of fully embracing a posthumanist approach. I applied a combination of reflective and diffractive approaches to explore connections with theory, matter, and nonhuman perspectives in later stages of the analysis and in the discussion of findings.

Preliminary Coding

While coding can be seen to align more with humanist research traditions (Saldaña, 2016), it has been used in other posthumanist research. For example, Somerville and Powell (2019) used coding – although their exact process is not described – to analyse notes, videos, images, and extended dialogic field notes in their posthumanist study. They determined overarching themes, and then applied a diffraction method to read various concepts and theories through each theme.

I considered using coding software and I conducted a trial of Atlas.ti, but I found that due to the large amount of video footage – as previously mentioned, over 14 hours – manual coding was more appropriate. I also found it allowed for a more holistic and intuitive approach that was better in line with posthumanist and common worlds approaches. To prepare the data for analysis, I created an Excel spreadsheet for describing and labelling the GoPro videos, which I will describe in more detail below. The interview with Jackie was transcribed using Descript software, which I then edited by watching the interview recording while reading the written transcript.

Once organized, I read and re-read all textual data and watched video footage several times to get a sense of the data as a whole (Saldaña, 2016). The interview transcript and field

observation notes were printed and manually coded using a blend of holistic and concept coding, which are appropriate for various forms of data and for a first cycle of coding (Saldaña, 2016). For example, a passage from my observation notes that read, “Jackie asks the children what snakes do in the winter and the children know that snakes hibernate in groups” was coded as “discussing animals.” When I was at the park doing supply teaching immediately following the main data collection period, I found a pencil on the ground that I ended up using for manual coding. I wrote the following reflection on January 29:

I have been using a green Laurentien pencil crayon that I found when I was with the children last week to do some hand coding. I like the connection to the site that it provides, and the idea that I not only cleaned up some “trash” but found a meaningful use for the object that directly relates to my study!

As noted, to help me analyze the video footage, I created an excel spreadsheet to file and describe 126 videos. Videos and photographs from the GoPro cameras and my handheld camera were discarded when they were blurry, taken by mistake, too short in the case of videos (i.e., under a minute), or otherwise not deemed useful. It is of note that GoPro automatically splits videos into shorter segments of 8 minutes, 52 seconds to protect the videos in case of technical malfunctions, therefore when the camera filmed for 45 minutes or an hour continuously, this resulted in several shorter videos with different file names, which is why there were so many videos. The following information was included in the Excel spreadsheet: file name, date, child filming, length of the video, brief description of events, notes, and reflections. Colour coding was also used to denote each of the six children, which gave me a visual grouping of videos produced on a given day.

My written description and reflections generated “language-based data that *accompany* the visual data” (Saldaña 2016, p. 57, emphasis in original). The following are examples of video descriptions:

- The children take turns swinging on a rope. Charles announces that he's thirsty. Jackie announces snack time. Charles walks around the site then sits down with his bag for snack and everyone gathers.
- Charles offers Jackie some strawberry loaf made of snow while Jackie sets up for a “stealth walking” challenge. The children take turns walking through the orange cones (without touching the alligators in the jungle).
- Oliver eats his snack while watching Jackie and the others using tools. Jackie is teaching them to file bark off branches. The project is making a snake. Oliver wants to pretend they are woodworkers. Jackie tries to motivate Joe to stay for 10 minutes before free time.

The following are examples of notes and reflections I included in the spreadsheet:

- Sean is trying really hard to fit in and get the other boys' attention. He seems to lack some social interaction skills to gauge their interest. He seems to hover.
- Jackie is great at planning activities that are group- and child-centered and build off the previous week.
- Jackie connects the birds in the book to what they have at the park or what they might know from experiences (e.g., zoo).

The descriptions were helpful for referencing and searching purposes and the notes and reflections helped guide my analysis. The pictures and short videos I took with my handheld camera were not coded, but there were relatively few of these and I viewed them several times

throughout the process to determine their potential relevance to other data. I linked their file name to my observation notes each day, so they constituted an extension of my field observations.

I identified several primary themes or “big ideas” that described my findings. Once these broad themes or ideas were identified, I combed through the data looking for related codes or passages to further examine. Inspired by MacLure’s (2013) writing on the role of wonder in qualitative data, I also highlighted specific moments, stories, and comments that felt important regardless of how they resonated with the more mechanical coding approach or if they fit into themes. As Hill et al. (2020) write, “a posthuman approach to research methods also demands alternative approaches to analysis” (p. 65). Therefore, I stopped coding after the first cycle and thereafter used a more intuitive approach.

Analysing Common Worlds Entanglements: Inspirations

Once I had become familiar with the data, identified some themes that stood out, took note of particular moments and stories that seemed important, and did background research on the primary non-human species who were prominent in the data, I turned to a more intuitive approach inspired by various concepts and analysis methods that aligned with a posthuman theoretical grounding and an examination of children within shared common worlds. I applied the concept of *thinking with* the data and infused the different sections of findings with reflections, theoretical connections, natural history, Indigenous perspectives, and new materialist ideas as seemed fitting. For example, a section about child-bird relations brought forth writing about the various bird species’ lives whereas a section about child-snow relations conjured a new materialist writing style focusing on the vibrancy and agency of snow itself. Inspired by the rhizoanalysis method, based on Deleuze and Guattari’s (1987) concept of the rhizome, my

analysis did not always follow a straight line. A rhizome is what connects a tree to microorganisms in the soil; it is a conjunction, an intermediary. Knowledge, when seen as a rhizome, has certain principles: “connection, heterogeneity, multiplicity” (Murriss, 2016, p. 168). Thus, rhizoanalysis helped me move beyond a traditional approach of interpreting and representing findings, creating space for different sections of chapters to follow various formats that connected and wove reflections, theory, and findings together.

I also was inspired by the concept of diffraction (Barad, 2007). As Mazzei (2013) writes, ... an analysis that relies only on coding, results in a reporting that focuses on “sameness” within categories as researchers adhere to the coding imperative to reach “data saturation.” A diffractive analysis, however, emphasizes difference by breaking open the data (and the categories inherent in coding). (p. 743)

Murriss (2016) describes diffraction, a term borrowed from physics, as a wave-like motion: “like two waves rolling closely together to the shore adding to each other’s force and creating new patterns – a ‘superposition’ – in which the old is still “present,” but has become entangled in new formations” (p. 30). Murriss includes “diffractive pauses” in her own work as transitional spaces woven into her chapters. She writes that she used no particular formula in creating these pauses, rather the idea was to diffract each story or photograph and, in the process, create something new. Such an approach is more emergent and unpredictable, producing different thoughts, wonderings, and questions (Mazzei, 2013). As Pacini-Ketchabaw et al. (2017) write, diffraction is generative of thought and can produce something new that does not need to be analysed for meaning but instead is helpful for shifting attention, which I also tried to accomplish.

Acknowledging that there are nuances in both humanism and posthumanism, and that pluralistic approaches can be helpful (Stables, 2020), I also used a more reflective

approach at times. Doing so allowed me to include thoughts on my own experience during the study, and to specifically discuss situations from a pedagogical or ethical perspective. I see value in both reflection and diffraction and therefore used both in my own analysis, although I tried to be careful to use humanist interpretation in a way that still aligned with my theoretical framework. In hindsight, my research questions undoubtedly led me to often focus on the children in the study, yet I also viewed children as part of a common world with other beings who are equally agential and with landscape, weather, and materials that are active participants in a shared experience of the world.

In Rautio and Jokinen's (2015) examination of the concept of a voice within research, they pick up on the work of other new materialist and posthumanist researchers to describe the collective voice emerging from children climbing or playing in a snow pile as "more-than-subject voice," which they describe as "a voice that does not originate in any single individual subject but arises from an assemblage of elements – as if there was one complexly clustered subject that echoed a 'voice'" (p. 7). I too found that idea helped my analytic process as it was a way to think beyond a human-centered perspective.

Writing Practices

Thinking about how to represent my findings, I used the initial themes that emerged during the preliminary coding as headings and subheading throughout the first draft of the chapter manuscripts, with the thought that these could serve as signposts for readers' ease and understanding (Saldaña, 2016). Within these sections I included, in some cases, narrative passages of events that occurred based on my observations, field notes, and/or the video footage. This type of writing is referred to as vignettes and has often been used to depict moments of interest in posthuman and common worlds research (e.g., Born, 2019; Malone & Moore, 2019;

Pacini-Ketchabaw & Boucher, 2019; Rautio et al., 2017). As Masny (2013) suggests, “vignettes are part of an assemblage (vignettes, researcher, research assistant, participants, etc.) and the study itself is part of a larger assemblage of a research event” (p. 343). In the coming chapters, I have chosen to present longer and more significant vignettes in italics and block quote format to make them stand out to the reader. Shorter observations and notes, such as examples or descriptions of events, are woven the main body of text, and direct quotes from my field notes are written following standard APA formatting.

I also have included and discussed other data such as pictures, interview excerpts, and reflections taken from my research journal. Akin to the diffractive approach of Merewether (2019), I use the combination of fieldnotes, observations, and theory, and “‘fly’ them with one another, each like the murmuring wings in a murmuration of birds, to see what intra-actions emerge as they mingle” (p. 109).

Echoing Russell’s (2005) and Kuhl’s (2011a) early calls for broadening how we represent the voices of the more-than-human world in environmental education, I made a deliberate attempt to shift from factual observation to more lively, affect-focused stories and to use the language of animacy instead of objectification (Kimmerer, 2013; 2017). Common worlds researchers have used this type of language in vignettes. For example, in the case of a story about a heron and group of children (whose scientific name is *Egretta novaehollandiae* and common name is White-faced Heron), the heron is referred to as a “she” rather than an “it” and goes by the name of Egretta as in this excerpt: “Egretta returns again, now standing on top of Rock. Her thin, stick-like legs stand out” (Blaise & Hamm, 2019, p. 97).

This practice echoes Indigenous perspectives of viewing all-world relations as kin and persons. As Kimmerer (2017) describes, in the Potawatomi language, “living beings are referred

to as subjects, never as objects, and personhood is extended to all who breathe and some who don't" (para. 6), such as rocks and wind. In contrast, the English language reflects the tenets of Western thinking in which only humans are referred to as persons. The language of animacy is helpful in countering human exceptionalism. Kimmerer (2013) refers to trees as people in some chapters of her lovely book, *Braiding Sweetgrass*, using personal pronouns for them. For example, in this story, she goes for a walk in a forest after moving to a new city:

I sought out my elder, my Sitka Spruce grandmother I introduced myself, told her my name and why I had come. I offered her tobacco from my pouch and asked if I might visit her community from time to time. She asked me to sit down, and there was a place right between her roots. (p. 206)

Following this lead, I experimented by using gendered pronouns or by capitalizing an animal's name, although it was a challenging practice at times since children in the study often objectified animals when talking (e.g., referring to an animal as "it") and I wanted to include their verbatim comments.

Research that acknowledges agency in non-humans requires a different approach at both the analysis and representation stage of research, which Collard (2015) summarizes as "analysis (constructing explanations that do not silence animals or collapse them into humanist frames), and writing (crafting narratives that enliven readers to the possibility of worlds beyond the strictly human)" (p. 136). I also included additional information about the more-than-human in different sections to provide the reader with more understanding of that particular plant or animal's world and possible perspective (umwelt), as well as a broader historical and cultural context.

Throughout the findings, I allude to the various types of data. Table 2 shows the acronyms I use to identify the source of the data cited.

Table 2

Identification of data types

Description of data source	Acronym	Additional information included
Field notes	FN	Date
Research Journal	RJ	Date
Educator Interview	EI	Page number of written transcript
GoPro footage	GP	Date
Handheld camera	HC	Date

Having now fully described the methodological “how” and “why” aspects of my study, I move on to sharing my findings, starting with the next chapter. I have opted for a writing style that weaves together findings and discussion. It permitted a rhizomatic approach to take each chapter in slightly different directions and I hope that this also allows the reader to gain a rich understanding of the themes explored in each chapter. Findings are split into the following themes, each one encompassed into its own chapter: becoming-with animals (Chapter 4), moving, learning, and intra-acting with trees and grass (Chapter 5), experiencing weather, place, and landscape (Chapter 6), and thinking with materials (Chapter 7). I present my data in each of these chapters through examples, anecdotes, or excerpts from field notes or interviews, as well as photographs taken by me or still images from the GoPro footage captured by the children. I then conclude with a final chapter containing further reflections on the study as a whole (Chapter 8).

Chapter 4: Becoming-With Animals

Many types of animals were enmeshed and entangled in common worlds with the children throughout the study, in symbolic, indirect, and direct ways. In this chapter, I wondered how the children might experience empathy for other beings, including coyotes, mice, and squirrels, through their imaginary play and through animal-themed books. Given that “relational knowing through direct experience of animals, ... differs qualitatively and sensuously from relationships with animals through indirect experience” (Fawcett, 2002, p. 126), I then focus on birds and dogs who stood out as particularly prominent non-human animal beings with whom the children were entangled more directly.

To bring in the voices of the animals I discuss, I describe their species through a natural-cultural history lens and by discussing typical behaviours and characteristics of their species. I also make connections to human-dog relations in Blackfoot history (Bastien, 2004) and Born’s (2018) thoughts on how the theory of affordances potentially applies to animals, and draw from the realm of common worlds and posthumanist research through the writing of Kummen (2019), Taylor and Pacini-Ketchabaw (2020), and Malone (2016).

Coyotes-Mice-Children-Play Entanglements

The group’s favourite organized game seemed to be “coyote-mouse.” This game was invented by the program director, Lilith, to keep the children moving around on cold days. It is a simple game involving a “coyote” running and chasing to catch the “mice.” I observed the children requesting this game frequently, sometimes more than once in one day. Jackie often led the game and played the role of the coyote, which was exciting for the children. Although this game did not involve learning about coyote or mouse lives, it did allow the children to have a positive experience while pretending to be these animals, mainly the mice. I wondered how

much the children connected with actual coyote and mice lives at the park. Did the fact that the game, associated with exhilaration, laughter, and playfulness, was named after two local species open possibilities for awareness and an appreciation for these nonhuman animals also living (or passing through) the park? Although I did not observe these animals over the course of the study, their symbolic presence was important, therefore I turn briefly to a description of their species.

Coyotes (*Canis latrans*) are a medium-sized member of the dog family and are found in all of Alberta's natural areas since they are habitat generalists (Alberta Biodiversity Monitoring Institute [ABMI], 2018). They are most active between dusk and dawn (Government of Alberta, 2021), so are not generally seen during the day. Coyotes do inhabit the study site and I have often seen online reports of coyotes in the park although I did not see any myself. Coyotes are "highly curious, intelligent and adaptable" (Government of Alberta, 2021, para. 1). They primarily feed on rabbits, mice, and squirrels; the Government of Alberta (2021) therefore writes that they "provide a valuable pest-control service to their human neighbours" (para. 1). This positive messaging is important given that coyotes are not always well tolerated in urban areas (Lloro & Hunold, 2020). Their presence has increased in urban areas in recent years and is predicted to increase further (ABMI, 2018). They adapt their behaviour to urban areas, taking advantage of food and shelter that often comes along with human activity.

Alexander (2017), who writes of the historic and cultural ties between coyotes and humans in Alberta, notes that:

Not surprisingly, because coyotes predate human occupation, the species holds a central and sometimes revered role in many Aboriginal stories. Coyote is trickster, song dog, shapeshifter, and creator: these evocative stories depict a deep, sometimes mystical relationship between early humans, coyotes, and the

environment. ... Revered by North American Aboriginal cultures, coyotes were subsequently persecuted without restraint by European settlers from the mid-1800s onward. Coyotes were systematically killed en masse (along with other carnivores) as part of a continent-wide effort to sterilize the land and make it suitable for cultivation and stock production. The killing mentality has migrated across generations and space, to become, in some social sectors, a de facto way of living on the land – killing coyotes is just part of what you do. (p. 24)

Alexander (2017) advocates instead for a co-flourishing of humans and coyotes in urban areas, noting the important role that predators such as coyotes play in preserving urban biodiversity and the needless killing and suffering of coyotes that could be avoided by allowing these animals to share space with us.

The field mouse, or meadow vole (*Microtus pennsylvanicus*), is a small mammal who is widespread in Canada. The iNaturalist database shows reports of these mice near the study site. The meadow vole is active both at night and during the day, feeding on a mostly plant-based diet consisting of grasses and other plants, and can show aggression through screeching and squeaking (Rowe, 2017). They may fall prey to larger animals such as owls and coyotes, and are hosts of many parasitic species like fleas and mites. They make their nests above ground (Rowe, 2017).

On one notable occasion captured by a children's GoPro camera, playing coyote-mouse led to children embodying mice through imaginary play. In this vignette, I describe the moment:

It was quite cold on this day, around -9^o Celsius, with the windchill -15. It was cloudy and snow partly covered the ground. The children had been running around to keep warm. They had been playing coyote-mouse and trying to escape from

Jackie who was acting as the coyote. After a while some of the children decided to slide down the hill. Oliver, who was wearing the GoPro made his way over to join his friends down below, saying to Jackie, “You’re still the coyote! We’re mice running underground!” He then slid down gleefully, saying “Yippee!” (see Figure 3).

The children made their way back up to the main path where the educator was. Oliver then started making very high-pitched squeaking noises. A few minutes later, Oliver said, “We’re going down into the rat hole! Let’s pretend we’re mice and the teacher’s a mouse too. We’re going down into the mouse home.” Joe seemed interested in joining the play idea and declared, “Mouse hole!” as he slid down. Oliver followed, “Let’s jump into the mouse hole!” as he slid down along the dry grasses and leaves. Once at the bottom again, Joe and Oliver agree that they are now in their mouse home. Oliver walks around the area making high-pitched squeaks again.

Figure 3

Oliver and Joe pretend to be mice underground



Note: Still images from GoPro footage, Dec. 11.

Here the change in height in the terrain seemed to provoke play about animals who live underground. Since the group had just been playing the coyote-mouse chasing game, the play got extended into more than just running around, but to embodying the movement, sounds, and thinking of a mouse (e.g., finding a suitable mouse home). Through their imagination, the children bridge the divide between human and mouse: in that moment, were Oliver and Joe children or mice? Pretending can be a powerful force leading to empathic understanding. Selly (2014) suggests that when children imitate animals or pretend to be animals in their play, they are demonstrating empathy and cognitive skills:

By taking on an animal's perspective, the children are demonstrating that they understand a wide range of behaviors and emotions. Children use their observational knowledge and playacting skills to demonstrate not only what they know but also their ability to empathize, to "put themselves in someone else's shoes." (p. 49)

The particular forest school class did not seem to show fear or negative attitudes towards either animal, though I do wonder what the reactions would have been to a direct encounter with either animal. Even without direct contact, the lives of coyotes, mice, and children were entangled and enmeshed through play.

Teacher-Led Animal Connections

The children regularly engaged in activities that were planned by the educator to increase their knowledge and skills in certain areas, such as crafting with sticks and tools, games to heighten their senses and physical abilities, and reading nature-themed books. Gruen (2015), in her writing on entangled empathy, argues that empathy is a cognitive process as well as an affective one, and that learning about other species, including their typical behaviours, can be

helpful in understanding and imagining the lives of others. Thus, some of the group activities led by Jackie may contribute to the children's ability to understand and empathetically connect to their all-world relations.

For example, Jackie led the group in various activities about bears, as captured in my field notes:

Jackie leads a game about bears hibernating where the children lie down in a "cave" and have to find some food (orange cones) and bring it back in time for winter.

Jackie names out the months of the year and notes that bears have to be back in their cave by November.... After the game, Jackie offers to read the group a book about a bear, *A Very Sleepy Bear*. After doing so, she reads a book that Oliver has brought (*Scaredy the Squirrel*) while the children eat their snack. A dog comes running up to the group. After the second book, Jackie introduces the bear craft [see Figure 4]. The craft involves sawing so she sets up the tool circle, marked off by an orange rope. (FN, Oct 30)

Figure 4

Julie proudly holds up her completed bear craft



Note: Photograph taken Oct. 30.

Although bears do live in Alberta and within a few hours' drive, they do not inhabit the park where the children spent their time. In other instances, games and activities were about animals that were from completely different bioregions, such as monkeys and crocodiles. Timmerman and Ostertag (2011) argue that there is a huge disconnect between the animals who children encounter outside versus the animals who children encounter in children's media such as books, toys, and songs, and that the animals portrayed there are often mis-placed and displaced. The authors thus promote more time spent outdoors and simply having less "stuff" as a way to provide a space for re-storying and cultivating our own bioregional animal knowledge and children's media. The forest school educational approach does lend itself to this notion given that there are no manufactured toys present and there is a focus on place and natural materials. That some of the activities were about animals who are not found at the site could indicate that the educator was trying to find fun and exciting imaginary situations for the children to engage with, such as pretending to cross a river filled with piranhas represented by orange cones on a blue tarp (which also offered a physical challenge in that it required careful walking).

Navigating Squirrel Depictions in Books

During each of the forest school sessions, the group enjoyed listening to the educator reading a book or two, usually while they ate their snack (see Figure 5). The books sometimes related to a particular theme (e.g., bears hibernating) as mentioned in the previous section, and other times, the group read *Scaredy Squirrel* books brought by one of the children.

Figure 5

Jackie reads a book to the children

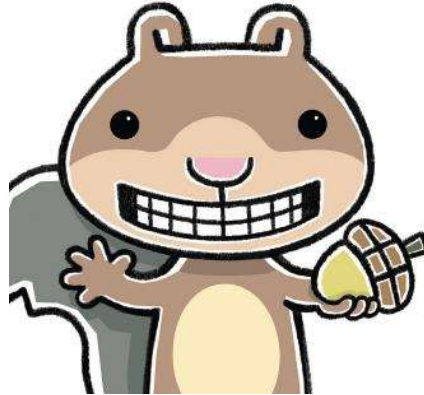


Note: Photograph taken on Oct. 30.

The *Scaredy Squirrel* books by Melanie Watt (e.g., 2011, 2012, 2021) have won many awards including the Ruth and Sylvia Schwartz Children's Book Award for Children's Picture Book and the Amelia Frances Howard-Gibbon Illustrator's Award. More than 1.6 million of these books have been sold worldwide (Oke, 2017), attesting to their popularity. The main character, Scaredy, is a flying squirrel who is highly anthropomorphised (see Figure 6). He even has his own Facebook page with over 15 000 followers (<https://www.facebook.com/ScaredySquirrel>). Scaredy is a very organized and cautious character who creates meticulous plans to avoid any sort of danger he perceives based on his fears or unknown situations. Despite his best laid plans, he always ends up needing to confront his fears and once he has done this, he learns valuable lessons. There is very little natural history information or any relevance to the real lives of squirrels in these books.

Figure 6

Scaredy Squirrel's Facebook profile photo



Note: Image source: <https://www.facebook.com/ScaredySquirrel>

Corrigan (2019), who wrote a book on squirrels and rodents in popular culture, states, “Collectively, squirrels are a major presence in our flesh-and-blood lives as well as in the virtual lives that we enjoy through popular culture” (p. 1). He explains that within children’s books, squirrels can be seen as “fun and frolicsome” (p. 7) but with a serious side that can convey important life lessons. As the following vignette depicts, one on occasion, the children spotted a real squirrel shortly after reading one of these books:

One day in November, the group was situated along the main paved path of the park and having their snack while reading another Scaredy Squirrel book. Unlike the main site they used in the park, this location gave them a view of the preferred squirrel habitat lower down in the park. Immediately after the book was read, the children spotted a black squirrel in the trees and turned their attention to the squirrel. They yelled at the squirrel and argued about what to name them. Joe repeated his request several times to his friends and to Jackie, “Please can he be named Scaredy Squirrel?” to which she agreed. The children seemed excited to

spot a living squirrel right after reading the book, but connected the squirrel to an anthropomorphised fictional character rather than a real squirrel with a squirrel life in the park.

Studies on eastern grey squirrels show that when they live in urban parks with regular human disturbance, they get habituated to the presence of humans. It is to their benefit to learn that humans do not pose a lethal threat; they can therefore save their energy and continue their activities such as foraging instead of running every time a pedestrian walks nearby (Engelhardt & Weladdi, 2011). A study conducted in Montreal urban parks showed that eastern grey squirrels remain at a similar distance from a potential refuge (e.g., a tree) regardless of the level of human exposure (Engelhardt & Weladdi, 2011). This is reassuring in a way since even in busier parks, squirrels do not seem to change their behaviour; they simply always need to be near refuge regardless. It therefore makes sense that the park squirrels in this case were more comfortable at the bottom of the bluff where trees and shrubs are considerably denser and that no squirrels tend to spend time around the area where most of the forest school activities take place.

In a setting where trees are barren for the winter, insect life has paused, and birds are mainly hidden or absent, squirrels were one of the most active species in the park. They have a strong presence, inhabiting the park year-round, and have invisible territories and hundreds of buried food supplies that lead to plant regeneration. Yet, their presence seemed to be distant in the children's minds, pointing to the complexities of animal-child relations even in an outdoor program.

Sharing Space with Birds

Over the course of the study, I found myself paying particular attention to birds, who comprised the main active wildlife inhabiting the park during the period of my multispecies

ethnography. The birds I most commonly observed were black-billed magpies, black-capped chickadees, Canada geese, and woodpeckers of various types, including Northern flickers. A word search throughout my field notes revealed the number of times I heard or saw various birds while I was in the park: “chickadee” - 24; “magpie” - 23; “flicker” - 14; “geese” - 12; and “woodpecker” - 8. Other species were only mentioned once or twice. Of course, there were likely many other birds that were out of my sight or hearing that I was unable to identify, as well as a host of birds who may have been active at night or flying through when I was not present to observe.

During this study, magpies, chickadees, and woodpeckers frequently shared the space with the children and other park visitors and Canada geese were seen flying overhead on numerous occasions but were not observed on land. In this section, I bring forth four species through describing both individual encounters and broader descriptions. In line with my multispecies ethnographical approach, these species are seen to be important research participants, regardless of the number or type of encounter they shared with children during my days of observation.

Black-Billed Magpie

Black-billed magpies (*Pica hudsonia*) are abundant at this park year-round and were seen on every day of observations. I noticed them both during the forest school program and when I was on my own, sometimes even spotting them right at the main forest school spot when the group was absent (see Figure 7). That made me wonder: Were the magpies investigating what materials and/or food might be left over from the forest school program?

Figure 7

Black-billed magpies at the research site



Note: Photographs taken on Nov. 18 and Nov. 3.

As described in *Hammond's Nature Atlas of North America* (1952)⁴, magpies often feed on “garbage”:

Who keeps the countryside clean of offensive carcasses, of butchering scraps, of offal and refuse? The magpie, an associate of the vulture. It also devours great numbers of injurious grasshoppers, weevils, grubs and caterpillars. ... Traditionally, they have the reputation of being impudent thieves. For these reasons occasional campaigns have been waged locally to destroy the magpies, yet they hold their own; fortunately so, for the conspicuous bird with the enormous tail is a diverting and sociable addition to the western landscape. (p. 115)

Indeed, magpies are probably the most conspicuous and easily recognizable birds in the park. I sometimes felt, during my observations, that the magpies were the strongest animal presence and

⁴ Excerpts from this Atlas provide historical and cultural information that modern field guides generally do not include, therefore even though there have been many scientific advances in terms of understanding the biology and ecology of birds since its publication date of 1952, the entries in it are helpful in situating human relationships and perceptions of animals.

seemed to dominate the area with their large bodies (for an urban bird) and loud vocalizations. Magpies are in the corvid family, who are known to be exceptionally intelligent animals, completing tests on cognition on par with chimpanzees and gorillas (Savage, 2018). While they are sometimes regarded as vermin due to their garbage-picking behaviours, the children and educator in this study did not seem to have a negative attitude towards them. In the following vignette, I describe a researcher-magpie-trash assemblage that took place during a moment of field observations without the children present.

As I was walking through the park, in the bike track area where the children like to play, I heard several magpies vocalizing. I observed a group of them sharing (or competing for?) a coffee creamer that had been left on the ground. I watched intently, feeling like an outsider in a strange land amidst a group of other beings who can understand and relate to each other. I could not see, at first, what item had caused the group of birds to vocalize, fly around the small area, and move to and from the ground. They seemed to take turns pecking at something. After a few minutes, the birds moved on and I moved forward and picked up the item. Noticing that it was trash (in my mind), I decided to take it with me and throw it out. I noticed holes where the birds' beaks had pierced the container, presumably so that they could drink the milk (see Figure 8). How clever! I wondered about the magpies' relationship with trash at the park and admired their ability to thrive in an area with abundant human activity.

Figure 8

Coffee creamer explored by magpie beaks



Note: Photograph taken on Dec. 11.

Birds such as crows were featured in common worlds writing in the book, *Feminist Research for 21st-century Childhoods: Common Worlds Methods* (2019). In one chapter, Kummen (2019) shares a collection of lively crow stories, suggesting “crowing” as a research method to rethink relationships with crows in early childhood spaces. She decenters the humans in her narrative, repositioning the stories as crow-human encounters. For example, in one story she writes:

Suddenly, Crow swoops down, lands on a branch and flies from one tree to another.

Kathleen and Jack watch in silence, their necks stretched out so that their eyes can scan the world above. “Caw! Caw! Caw!” ... A flash of black appears as another crow flies across the skyline. Crow’s companion call invites Kathleen and Jack to notice the sky’s west-coast palette of colors. (p. 87, emphasis removed)

Kummen (2019) also was drawn to consider the importance of waste in the relationship, a parallel I noticed immediately, and which makes sense given that crows and magpies are both corvids and have some similar behaviours. She reflects, “I was provoked to consider how the

children and I are implicated in the neoliberal project of becoming and being consumers who produce waste and how the crows participate in that project as waste consumers” (p. 89).

Although in my story with the dairy creamer, the children were not present, I could imagine that magpies are similarly involved in the performance of a consumer lifestyle at my research site where garbage is often left behind. Perhaps, then, birds such as crows and magpies can be seen as teachers, helping us to better understand our relationship to waste and reminders that human-animal relations are always political and ethical (Kummen, 2019).

Canada Goose

Canada geese (*Branta canadensis*) were also part of the forest school experience, even if only seen flying in the sky (see Figure 9). These are large birds (30-43 inches) and are the most widespread goose in North America. They are often seen in flocks travelling in a V shape (Peterson, 2010). Jackie remarked that the children “always notice the geese Vs going overhead, especially in the fall, like every class, someone mentions how crazy they are, big they are” (EI, p. 2). I too found them impressive and they captured my attention as well as they made their way further south for the winter, often flying quite low.

On one day I estimated that 50 or 60 geese must have flown by in formations during the forest school session. Towards the end of the fieldwork, I noted in my observation journal during a sit spot: “A large flock of geese flew by, north. I took some pictures. I like hearing the beating of their wings from below – sounds like such effort!” (FN, Nov. 27). How far were these geese travelling, I wondered? Were they flying to a warmer place where there were suitable grounds for overwintering? I noted that they were flying north even though they typically are heading south at that time of year, but this could have been due to wind currents or for many other

reasons. How much nourishment it must take for these large, heavy birds to take off into flight, against the force of gravity.

Figure 9

Geese flying overhead



Note: Photograph taken on Nov. 27

Langen (2020) writes, “Geese fly by day or night, depending on factors like weather conditions or the brightness of the moon” (para. 7). They navigate based on “experience, using landmarks including rivers, coastlines and mountain ranges” and they “have a physical compass in their head that allows them to tell north and south by detecting the Earth’s magnetic field” (para. 8). Their distinctive V formation is an energy-saving trick. Geese understand wind currents and use drafting to their advantage. Before migrating south, they gorge themselves with grasses and grains in preparation for their journey (Langen, 2020).

When I was with the forest school group one day, I observed:

A formation of geese flies overhead. One child, Charles, was already lying on his back in the snow, and is the only one who turns his attention to the geese. “Geese!”

he says. Jackie asks him, “How do you know?” Charles: “Because they’re honking.” (FN, Oct 23)

In this short moment, a sky-child-educator-geese assemblage was formed. The child was already lying on the ground looking up at the sky. The geese could be quite loud when flying overhead and, in this instance, they captured Charles’ attention in a multisensory way – through both sound and sight. I noted in my observation that no other children turned their attention to the geese in that moment, even though they could probably hear them as well as Charles’ exclamation. Were they so focused on what they were doing that they did not attend to the geese? Or perhaps because the geese were so abundant and common during this time of year, they seemed mundane and uninteresting? Warkentin (2010) discusses the importance of “bodily enactments of openness and responsivity in interspecies interactions” (p. 118) and suggests a praxis of attention as a way of ethically approaching and being with other animals. Perhaps the difference here between Charles’ and the other children’s relationship with that flock of geese could be that he engaged his body and senses towards their presence and *attended* to them, by “being fully present in the moment and responding to what is occurring in the here and now” (Bartnæs & Myrstad, 2022, p.80).

Northern Flicker

Another commonly observed bird species was the Northern flicker (*Colaptes auratus*), a bird that, according to the Peterson Field Guide to Birds of Western North America, “often hops awkwardly on [the] ground, feeding on ants” (Peterson, 2010, p. 238). In the first few days of field observations, I noted the presence of flickers near the main forest school location in the park. For example, in one entry from my field notes, I wrote:

I notice a Northern flicker. I had heard a tapping in the trees earlier, but wasn't sure if it was a bird. It was likely the flicker. The flicker flies to another nearby tree and then I notice two flickers. They fly over to another tree, seeming to circle around the group. I point the birds out to Jackie. She remarks that it is nice to have them around year-round. (FN, Oct. 30)

Figure 10 shows one of the flickers from the above observation.

Figure 10

One of the flickers circling around the forest school group



Note: Photograph taken on Oct. 30.

Hammond's Nature Atlas of America (Jordan, 1952) describes Northern flickers in the following way:

This friendly woodpecker is so common, it has acquired more than 20 names, most of them cheerful like high-holer, wickup, yellow-hammer and wood pigeon. It is a good fellow as far as the bird world is concerned, and seemingly lives on the best of terms with the songbirds, the sparrows, the hawks. ... While enjoying some wild

berries and seeds, its main food consists of beetles, ants and other insects which are speared with its long and sharp tongue. The latter can be flung out for 2 ½ inches beyond the bill, and its sticky saliva acts as an adhesive to which small creatures are instantly attached. (p. 112)

On one day, I was walking back down to the pick-up spot with the group and noticed many birds near the path, including a flicker and two other species of woodpeckers. I pointed them out to the group since I was near the children at this point and showed my own personal interest by stopping to watch them. In my fieldnotes, I wrote, “Sean was interested, asking me where the woodpeckers were. This made me realize that the children really do have more opportunities for wildlife encounters by spending time in the park (and that it can be useful to have someone point these out)” (FN, Nov. 20). With this observation, I reflect on my role as a nonparticipant observer throughout this study. I did not have the opportunity to share my own personal interest in birds with the children, except on rare occasions such as this one. As Bell (1997) suggests when writing about the practice of natural history in environmental learning, modelling behaviours such as actively observing or listening to wildlife could have a profound effect on children and potentially spark their interest.

Black-Capped Chickadee

Black-capped chickadees (*Peocile atricapillus*) were a commonly observed bird at the park and present on most days of observation. They are a small bird that many people find attractive, and they easily adapt to living alongside humans in busy parks – they are one of the only birds willing to land on a human hand holding out seeds. Handfeeding was not a common practice I observed in the park but rather is indicative of a species behavioural characteristic. The positive perception of chickadees is reported in the *Hammond’s Nature Atlas of North America*:

To alight on a branch upside down and nonchalantly eat a meal in that position, is one of the most amusing habits of this little bird. It is intriguing also in other ways: It is not just a fair-weather friend, but stays with us all winter; indeed, we see much more of it during the cold months when a piece of suet or a handful of sunflower seeds will bring a flock of chickadees to the feeding station. (Jordan, 1952, p. 116)

Chickadees often presented themselves near where the group of children were engaged in play and activities. The following vignette provides an example:

It is a sunny day and around 6° Celsius. Most of the snow had melted the day before when it was around 15° so the ground was dry. The GoPro video shows Julie a few feet away from Charles who is wearing the camera. She is quietly working on a craft project and he is having his snack. A chickadee is seen to fly into the tree about eight feet in front of Charles. “Chick-a-dee-dee-dee,” the little bird calls. Jackie points it out playfully, asking, “Who’s making that noise?” Charles answers, between bites, “Chickadee” and Jackie confirms, “Chickadee’s making that noise.” The bird is seen flying to another nearby branch close to other children and calls once again. The children carry on with their activities.

What was the chickadee communicating in that moment, and to whom? Young (2012), an expert of bird communication, teaches us that the “chick-a-dee-dee” vocalization has multiple functions “including predator mobbing; ... as an ‘all clear’ call after the predator has left; or as a food source is located” (What the Robin Knows: Bird Language Audio Library, n.d). Given that Charles was eating his snack at that exact moment, I wonder if the chickadee had noticed a potential source of food and was indicating it to fellow birds? Notably, the educator also asks “who” is making that noise, as opposed to “what,” therefore personalizing the creature.

On another day, I observed: “There are two chickadees right around the group, calling, but the children don’t seem to notice. There are several chickadees – it seems like they are all around us!” (FN, Nov 3). The following short vignette also illustrates a similar nonchalance on the part of the children to chickadee presences:

I noticed two chickadees alighted right above the tool circle where I, Jackie, and Charles were located. Charles looked up when I pointed out the birds, but he did not seem that interested. Jackie got out some bird seed and set it down on the ground nearby on a plastic container, but by then the birds had moved on and did not come back to feed before it was put away again at the end of the program.

The chickadees were bird presences often seen and heard, but they did not usually capture the children’s attention for more than a moment. In the interview, I asked Jackie what sort of experiences she noticed the children having with animals in the fall and winter or what types of animals tended to draw the children’s attention during that period. She immediately answered “chickadees,” adding that they “try to do stuff with the chickadees because they’re so cute, and they’re around” (EI, p. 2). She added that in the past, various groups around this age have enjoyed making bird feeders at forest school, and that she was hoping to do that in the winter with this group. While this particular group of children did notice the birds, she remarked they do not “do a ton with it” (EI, p. 2).

The chickadees, and other birds previously discussed, are examples of “mundane” or ordinary animal presences who share a common world with the children. Taylor and Pacini-Ketchabaw (2015) explore children’s encounters with other such creatures – ants and worms – and they raise questions “about our entanglements and mutual vulnerabilities with other species in these challenging ecological times” (p. 509). They suggest that even seemingly minor and

trivial encounters with everyday animals can show us how to respond and respect multispecies common worlds, but that this “can only happen in those embodied (and often fraught) moments when humans and animals actually meet and notice each other” (p. 525). What, then, of the children who did not notice, or either ignored, the chickadees? Were they not “learning to be affected” (Taylor & Pacini-Ketchabaw, 2015, p. 514) and to become attuned to these other beings? What might that tell us about the sorts of learning that might, or might not, be happening in this forest school?

Although Jackie led various animal-focused learning activities, none were specifically related to birds during the study, indicating perhaps that they had focused on birds prior to my study, a lower personal interest in birds on Jackie’s part, or little interest shown by this group of children on which she could build. In contrast, my own personal interest in observing and studying birds increased over the course of my fieldwork as I intentionally spent time observing the nonhuman inhabitants of the park, which when it came to wildlife most prominently were birds at that time of year. Another prominent nonhuman animal was the domestic dog.

Frequent Encounters with Dogs

The location of this forest school program is completely encompassed by an off-leash area of the park; thus, it is a popular dog-walking area. Although in the first few weeks of the multispecies ethnography I was reluctant to include dogs in my observations since my own inclinations led me to be very focused on wildlife, it soon became apparent that dogs were an important component of the multispecies assemblage that could not be ignored. The children had mixed reactions to dogs – from being oblivious to curious and interested – that seemed to depend on their personal interest and what they were doing at the time a dog visited. Jackie played a key

role in mediating child-dog encounters and saw the presence of dogs as a teaching opportunity. Several dogs were seen on each day of field observations and featured in many video recordings.

Dog Kin

Dogs (*Canis lupus familiaris*) “evolved from the gray wolf into more than 400 distinct breeds” (Vanacore, 2021, para. 2). Even though dogs vary enormously in shape and size, they are all the same species; many different breeds were seen at the park. Vanacore (2021) notes that “characteristics of loyalty, friendship, protectiveness, and affection have earned dogs an important position in Western society” (para. 3). Dogs require regular exercise and the off-leash park with its many paths and natural features offers dogs a perfect place to explore the world, be active, socialize with other dogs, play, and connect with their human companions. Due to my previous experience walking in the park with a friend and her dog, I know that many of the regular dog walkers know each other and the dogs by name – it is a community.

Dogs also have a well-developed sense of smell and sense of hearing – both superior to humans (Vanacore, 2021). Their heightened sense of smell may lead them to an open box of snacks hiding on the ground where a group of children had just gathered and left food behind. Given dogs are omnivorous, they may snack on this food themselves when they get a chance. As well, for those dogs keen on interacting with children, the forest school group can offer them opportunities to seek attention and affection. Dogs thus were a constant part of the forest school program and offered frequent opportunities for children to connect and intra-act with other animals, especially when the group of children made their way along the main paved path to their main spot in the park, as depicted in Figure 11.

Figure 11

Dogs are commonly taken for walks along the park paths



Note: Photograph taken on Nov. 6.

The children had mixed reaction to the presence of dogs, likely depending on their individual comfort level. One day, I reported, “We passed about eight dogs on the way up. The children are usually either oblivious or curious and interested in the dogs, and they comment on their presence. Sometimes they ask the adults dog questions” (FN, Nov. 6).

With dogs running in and around the group of children frequently, the children had opportunities to touch, talk to, observe, and even include dogs in their games. On one significant occasion, the children seemed to imagine what a dog might be feeling and thinking, a form of empathy (Batson, 2009):

It was cloudy and quite cold on this day. Light snow was falling and the temperature with wind child was about -17° Celsius. Julie was making “cupcakes” by filling a muffin tray with snow and “baking” them in a pretend oven. As Julie was walking toward the group holding her freshly baked cupcakes, a dog ran right up to Jackie and the children (see Figure 12). Jackie immediately welcomed the

dog by name, saying an enthusiastic, “Hi Bertie!” that all the children could hear. She explained to the children that she identifies Bertie by her black colour and her waffle collar. The children were amused and engaged for a moment while the dog sniffed and investigated the children and their materials. A dog whistle was heard, beckoning Bertie back to her human companion. As Julie was holding the muffin tray, Bertie came close to her, knocking off a bit of snow, then running off. Amused, Julie called to Bertie, “Hey, try to eat the cupcakes!” Jackie laughed. Then after a short pause, Oliver added, “He doesn’t want cupcakes. Let’s make some liver-flavoured..., let’s make some liver-flavoured cupcakes!” Jackie paraphrased this last statement back to him and Oliver added that dogs love liver.

Figure 12

Bertie runs over to the group



Note: Still image from GoPro footage, Oct. 23.

In this story, several concepts are highlighted. First, the educator feels comfortable with the approaching dog and demonstrates friendliness by greeting Bertie by name. The children’s reactions then show that they want to interact and include Bertie in their play. Oliver’s final comment demonstrates that he took a moment to imagine the dog’s perspective. He imagined

that Bertie doesn't eat cupcakes since she is a dog. He connected his previous knowledge of what dogs like – liver – to the play scenario and suggested a way that might include Bertie in the current play, by making liver-flavoured cupcakes.

This was the only instance I observed when the children actively tried to include an animal in their play. That this happened with a dog is not all that surprising, because they were one of the animals they encountered regularly in the park. Melson (2001), in her writing on animals in the lives of children, suggests that “domesticated animals are, in effect, childlike versions of their wild ancestors” (p. 25) and that “from a child’s perspective, neotenous pets and domesticated animals are interspecies peers. The human child sees childlike animals as variants of fellow children” (p. 25). Since humans have been carefully breeding dogs for certain traits over thousand of years (Vanacore, 2021), an intimate interspecies bond has developed. Further, many children are familiar with dogs and it may be easiest for children to imagine play possibilities with dogs than with the other animals at the park.

On another day, Julie was rolling down the hill when Archie the dog came running toward her, which caught her attention. She stopped and looked at Archie. Video footage from a GoPro recorded this moment, where they seem to acknowledge each other briefly before Archie is called back by his human (see Figure 13). Throughout the study, it became apparent that Julie was very keen on connecting with dogs whenever she could.

Figure 13

Julie and Archie acknowledge each other



Note: Still image from GoPro footage, Oct 30.

A diffractive reading of Figure 13 may be useful here. First, it must be acknowledged that this is not a photograph; this moment was carefully selected from video footage by me as the researcher as it seemed to indicate an interesting moment of multispecies connection. Therefore, there is a level of intentionality that impacts what moment is depicted. This image also offers an opportunity to apply posthumanist thinking. Likely, the viewer's gaze is drawn to the child in pink. As Hultman and Lenz Taguchi (2010) note, children in photographs seem to have a magnetic power over our gaze; they stand out from the background. Shifting away from this humanist tendency, we (you, the reader, and I, the writer, who are both viewing this image) can look also at the materials and beings in a *horizontal* and *flattened* way (Hultman & Lenz Taguchi, 2010) where everything in the image is given the same level of importance. Grass is no longer part of the background, but an active part of this moment. Would Julie be comfortably sitting on the ground without it? Would the rest of the group have paused at this location, allowing this Julie-Archie moment, if grass had not offered something of interest to examine?

Archie is clearly on the move, while Julie patiently observes, casually beckoning her dog acquaintance. The body position of the dog and child indicates mutual interest and an example of “forces that overlap and relate to each other” (Hultman & Lenz Taguchi, 2010, p. 529). This was a brief moment, as Archie was called back and left shortly after. Might this moment still have impacted and shaped them both in intangible ways?

Teacher-Dog Co-Teachers

Dog encounters were often mediated by the educator’s behaviours and guidance. In the interview, Jackie identified herself as being “obsessed with dogs.” She viewed the presence of dogs as a positive aspect of the program since she felt they provide opportunities for her to help any children who are afraid of dogs, facilitate children’s sense of responsibility (since the dogs will eat their snacks if they do not put them away carefully), and they leave tracks that can be interesting for the children to observe in the park.

Jackie noted that the children’s level of comfort with dogs varies and remarked that most children do not notice the dogs that much. She said, however, that sometimes there are groups of children who are so interested that “we can’t talk until the dog has passed because that’s what all the kids’ focus is on” (EI, p. 3). My observations of the group confirmed that some of the children in my study were particularly interested in the dogs, while others did not seem to pay much notice. In the interview, Jackie said that she feels it is her responsibility as an educator to help the children have positive experiences with dogs and to share the park with the dogs. This was demonstrated in the following observation:

The group is slow to walk up the path today. George slid down [the hill] and the group had to wait. A dog ran down and barked at him from 1-2 ft away. George stood still like a statue and the owner eventually got the dog to come back up to the

path. Jackie gives a thumbs up to George who clearly did as he was taught when confronted by a dog. (FN, Nov. 20)

This episode was very striking to me as an observer because the child was clearly uncomfortable and was alone at the bottom of a hill with a medium-sized dog barking directly at him. I could only imagine that he was scared, yet all the adults were on the path looking down and unable to help him in that moment. Once he had patiently waited for the dog to leave, he immediately looked up to Jackie who gave him a smile and a comforting sign of approval for how he handled the situation. This could have been an important learning opportunity for George. Jackie later shared with me that she had been surprised that this particular dog had been so reactive and was happy to know that George had remembered the instruction to be very still like a statue when faced with a dog with whom they did not want to interact.

On another day, Julie was colouring small sticks on her own to create pretend gems for imaginary play with the other children. She spotted a dog coming toward her and yelled out, “Dog alert!” to Jackie who was nearby. Jackie introduced Julie to Gronk (see Figure 14) and the following conversation took place (transcribed from Julie’s GoPro footage):

Jackie: “This is Gronk.”

Julie: “Hi Gronk!”

Jackie (as Gronk comes closer to Julie): “He’s really friendly, he loves kids.”

Gronk comes right up to Julie.

Julie: “Hi! Awww!”

Jackie: “Yeah he’s pretty cute, he’s one of my favourites.”

Julie: “Gronk lets kids pet him!”

Jackie: “He lives with seven kids I think.”

Gronk is now out of the GoPro visual and presumably has moved on.

Figure 14

Gronk the dog approaches Julie while Jackie observes



Note: Still image from GoPro footage, Dec. 4.

Jackie feels confident in interpreting dog behaviour and mediating the children's interactions with dogs, which she herself associates with her own love of dogs. She knows most of the dogs by name and greets them when they come.

Given the off-leash park context and the time of year of the study, which limited the activity of wildlife, the dogs constituted a major member of the forest school assemblage. During the interview, Jackie remarked that dogs were "their wildlife" and that as a group, she and the children probably knew more about dogs than any other species. Jackie and the dogs became co-teachers of sorts, or perhaps the dog encounters were the teaching moments themselves. As Murriss (2016) writes, "teaching, more broadly and in less humanist terms, can be any object or event that makes a difference, that *disturbs*" (p. 145, emphasis in original). A dog running up to the children during their play time at the park creates these moments that disturb, and when encouraged to engage with the dog, a relational moment is possible when new knowledge can be

created. Within the posthumanist realm, knowledge is part of being and knowing is a physical engagement with the world, an “ongoing reconfiguration of the world” (Murriss, 2016, p. 146).

A Historical Connection

Dog-child relationships have historically been important within Indigenous communities. Taylor and Pacini-Ketchabaw (2020) describe the kinship with dogs that was and is important to Inuit and Central Aboriginal communities. For the Inuit, before the mid-20th century, sled-dogs provided an essential mode of transportation across snow and ice, and this practice persists today. These dogs were not considered “pets” but rather “fully fledged agentic partners within the Arctic human-animal hunting assemblage” (p. 102). These dogs also are regarded as having a soul and personhood and in sibling-like relationships with children. What it reveals, according to Taylor and Pacini-Ketchabaw, is the idea that the “specialness of child-dog companion relations need not be based upon anthropomorphic sentiments, nor confined to the domestic sphere of the modern nuclear family” (p. 113) as is often the case in contemporary Eurocentric societies. In a similar vein, in a study of human-sled dog relations, Kuhl (2011b) notes their complexity and reciprocity, reflecting on what lessons educators could take from these.

Bastien (2004), in her historical account of the the *Siksikaitsitapi* (Blackfoot) people in Alberta, describes an important time before the 18th century called the era of *Iitotasimahpi Imitaiks*, or era of the dog. During this time, the *Siksikaitsitapi* travelled on foot with dog companions, marching in small groups following the movements of the bison over the grasslands. Dogs carried loads of up to 75 pounds on a wooden travois, helping groups carry their belongings. Bastien writes, “The dog was given respect because it was seen as the companion of humankind possessing *I'ta'kiwa* [*has spirit*] and consciousness. The gifts that dogs give are loyalty, and even their lives, in order to protect their *Siksikaitsitapi* partners” (p.

13). Dogs were also said to give a specific bark to alert of a ghostly presence such as the spirit of a loved one. Horses were introduced in 1630 and were first named “big dog” by this Nation. They changed the lifestyle of the *Siksikaitisitapi* considerably, facilitating travel and connections, bringing about a new era, the era of the horse (Bastien, 2004).

As I reflect on this history, it occurs to me that dogs may have walked with their human companions for centuries on the very land on which the park research site sits. They were respected and must have been greatly appreciated for the service they provided (Bastien, 2004), not unlike the Eurocentric human-dog relationship today. I wonder if dogs moving through the park today can feel the presence of dogs from hundreds or thousands of years in the past. What would the land around the park have looked like and felt like in the era of *Iitotasimahpi Imitaiks*? And how many Blackfoot people today walk with dog companions across this land?

Reflections on Child-Animal Relations

Children-animal relations were very different depending on the situation and of course on the species. With many birds and many dogs regularly sharing a small area of the park with the children (and each other), why did the interactions and relations with these animals feel so different? Why was I initially drawn to paying attention to the birds but had to intentionally include dogs in my observations since I originally dismissed their value in the multispecies assemblage?

While there has been some research conducted on young children’s relationships and encounters with dogs (e.g., Dueñas et al., 2021; Jalongo, 2008), these tend to be from a child development perspective. There has been little research on children and companion animals that uses a posthumanist/common worlds research frame. Malone (2016) did conduct a study with children living in slum communities of La Paz, Bolivia who had close relationships with street

dogs. She used a posthumanist and new materialist lens to examine these child-dog relationships, in which the children were decentered and the dogs were seen as agential beings. Malone reflects that both children and dogs experienced place in a sensory, embodied way; for example, she writes, “the sun on their faces, the allure of the snow-capped mountains, the birds singing, the smell of the rubbish, the fear of strangers” (p. 52). In my study, both dogs and children experienced place by running on the ground (bare soil, grass, or snow), feeling sunshine, rain and snow on their bodies and faces, hearing the bird chatter and the various city noises, feeling the long grasses on their hands/paws, and having their leader call them back occasionally. These two types of mammals also were curious about each other.

In line with Malone (2016), I connect the dog-child relation to Tipper’s (2010) emphasis on the physicality of the relationship. In the example of the young boy and the large dog who was barking at him or in the many other times when the children were sitting down when a dog came over, sniffing and licking, seemingly taller than the sitting children, there clearly was an important physical connection. In comparison, the birds would have experienced the same park in different ways, given their bodies and ability to fly. The birds present in the area at the same time as the children were always at least a few feet away from the children, and mostly above their line of sight on a branch. Aside from the Canada geese flying overhead, these birds are much smaller than young children. They also were one of the types of animals most familiar with the place given they were not transient like the dogs and children, which enables a different connection to the site and presumably a much more profound knowledge, whatever that bird knowledge might be like.

The theory of affordances may also present a useful element for discussion of child, bird, and dog assemblages. Although normally the theory of affordances, first coined by Gibson

(1979), describes the potential that an *object* offers to children within and early childhood education context, Born (2018) applies this theoretical concept to animals, thus offering a broader definition:

Moments between young children and animals can therefore be characterized as interactions (when the child and animal are interacting directly, as in capturing insects or feeding fish) or as affordances, when the child is in the presence of an animal and is interested or cognitively engaged with the animal. (p. 50)

Born suggests that educators should seek out encounters with animals for potential affordances, “recognizing that simply being with or in proximity to animals is valuable and important in its own right” (p. 53).

The affordances provided animals in my study were very different from each other. Dogs afforded children the opportunity for tactile encounters at their own level, mediated by another human who was responsible for the dog, or by Jackie. Dogs also were seen to have individual personalities and had names. Birds provided an opportunity for children to identify species by sound or sight, to provide seeds as an act of care for wildlife, to hear/listen to bird song, and to observe. These types of interactions or affordances are felt differently through the bodies of the children and adults, and presumably in the dogs and birds as well. Dogs provided a more accessible and easy interaction for most of the children, although as I have previously mentioned it was not always welcomed by some of the children. Birds were more distant yet were nonetheless very much a part of the forest school experience as well. As for other species that figured more symbolically, there were fewer opportunities for individuals to connect in a shared moment. However, the lives of children and squirrels/bears/coyotes/mice are entangled

nonetheless and the forest school offered some opportunity for children to explore those relations through books, games, discussions, and imaginary play.

Conclusion

Throughout the study, children, humans, and dogs shared the park space with urban wildlife inhabiting the park. Biodiversity provides a potential for pedagogical explorations, either led by an educator, or led by the children's direct experiences touching, seeing, and hearing animal others. Animals draw children's attention starting in infancy (Russell & Fawcett, 2020), and in my study dogs notably participated in the forest school experience. They ran up to the children with familiarity, posed an ongoing threat to any snacks left out in the open, sometimes barked directly at a child, and ran by playfully. Birds were ever present and highly attuned to the goings on of the group of humans, yet this was often not reciprocated by the children.

Nonetheless, I wonder if the mundane presence of birds, such as the sounds and sights of geese flying overhead or the flickers pecking at insects, even when not obviously attended to, provides children a sort of baseline, to borrow Young and Gardoqui's (2013) term, that could provide children with a sense that they do indeed live in a multispecies common world? Perhaps this recognition, even if barely acknowledged, affords them a particular type of understanding of their natural environment and their place within it.

Other species were also symbolic presences through stories and play, and although the children's relationships with these beings were not generally grounded in firsthand sensual and embodied experiences, some of these animals did inhabit the research site thus indirectly shared an experience of place, weather, and time. Children's reflections, imaginings, and discussions about the lives of these animals through their playful experiences could be openings for empathy (Gruen, 2015; Selly, 2014) and meaningful inter-species connections.

Chapter 5: Moving, Learning, and Intra-Acting with Trees and Grass

Due to the season, most plant life at the park was dormant during the study. One question I posed to Jackie during the interview was about how children engaged with plants during the fall and winter. She responded that in the spring, there are many edible plants that the children can eat, such as mustard, alfalfa, and clover, “so we pick these plants and often eat them and that’s really fun” (p. 6), quickly adding with a laugh that this is not possible in the winter. However, trees were still standing, albeit with the deciduous ones devoid of leaves, and long grasses from the previous season sometimes covered the ground when snow had melted. This varied plant life presented many opportunities for intra-actions and encounters during the forest school program.

In this chapter I first introduce these plant beings through sharing natural-cultural historical information, then I move on to describe the main types of child-tree and child-grass interactions I observed over the course of my study, drawing on Kahn et al. (2018, 2020). Along the way, at opportune times I attempt to *think differently* and *think with theory*. I also discuss the lack of existing posthumanist/common worlds research that attends to child-plant relations and refer to literature grounded in other theoretical traditions (e.g., Archer, 2014; Gull et al., 2017; Kimmerer, 2013; Pelo, 2013, Wohlleben, 2016).

Tree and Grass Beings

At the park, there are many deciduous trees and a few coniferous trees. As Suzuki and Grady (2004) explain, “Deciduous trees are adapted to climates with long, cold winters or to seasonally dry climates at lower altitudes; dropping their leaves in the fall and growing new ones each spring costs less energy than maintaining leaves through extended subzero temperatures” (p. 66). Therefore, during the months of October to December, the tree branches of deciduous

trees were bare, making it easy to see through a larger area and providing a more open feeling in the park (see Figure 15).

Figure 15

A view of the main forest school spot in the park



Note: Photograph taken on Oct. 23.

Most of the trees at the site are balsam poplars (*Populus balsamifera*) who are native to Alberta. These trees are very hardy and can take the fluctuating temperatures. Their leaf buds (see Figure 16) support a variety of wildlife, they provide shade when fully leaved out, and they can act as a wind barrier. As Peattie and Landacre (2013) write, a balsam poplar tree “gives fuel and shade where none could be expected” (p. 290). The winter buds are described as yellowish, gummy, and strongly fragrant and they have a number of medicinal uses once the resin has been turned into an ointment or tea (Foster et al, 2000). This tree clearly has many gifts to offer others. They can even act as a nurse tree, “preparing the way for the seedlings of Spruce” (Peattie & Landacre, 2013, p. 290), which helps shape the future of the forest. Balsam poplar trees are pioneers who grow quickly and live around 70 years (Kershaw, 2001).

Figure 16

Balsam poplar winter bud



Note: Photograph taken on Nov. 1.

The area also contains white spruce trees (*Picea glauca*), which grow well with support from the poplars. Interestingly, “by keeping their needles year round, conifers can photosynthesize nonstop even during the winter months, when light levels as well as temperatures drop dramatically” (Suzuki & Grady, 2004, p. 67). White spruce trees can live up to 200 years and start producing seeds at 20 to 40 years. I wonder how many seasons the young spruce tree in Figure 17 will see before they start producing seeds of their own? These trees provide “food and shelter for grouse, seed-eating birds, red squirrels, porcupines and black bears. Red squirrels nip off the cones and young shoots” (Kershaw, 2001, p. 54). White spruce wood was traditionally used by Indigenous Peoples to make canoes (Kershaw, 2001).

Figure 17*Young White spruce tree*

Note: Photograph taken on Nov. 1.

There are a few other species of trees around the park but given the season it was more difficult for me to identify them.

The park is located within the fescue grassland ecoregion of Alberta. This ecoregion is naturally “dominated by rough fescue with lesser quantities of Parry oat grass, June grass, and wheat grass” (Auger et al., 2015, para. 3), though most of this grassland has been disturbed by grazing and tillage. As Auger et al. (2015) describe, “soils that have formed in the region are deep black with high organic matter due to the combination of favourable climate over thousands of years, grassland vegetation and geology” (para. 3).

Olson (1994), in a journal article on Alberta’s past and present uses of grasslands vegetation, reports that “before European settlement the main use of Alberta's central and southern prairie vegetation was year-round bison grazing. Large herds of bison utilized these prairies in a migratory pattern” (p. 61). Bison (or *iiníi* in Blackfoot) would move to the fescue

prairie in the summer when grasses in other areas had become “unpalatable” (p. 61). Rough fescue has a high nutritional value and the fescue prairie area has more available water in late summer and fall than other areas. Bison even stayed in the fescue prairie (and aspen parkland region) during winter; “They chose these regions because of the nutritious Rough Fescue forage and because frequent chinooks left the hills in the Fescue Prairie bare of snow” (Olson, 1994, p. 61). After settlement, prairies were transformed for domestic crop production and livestock grazing (Olson, 1994).

At the study site, I identified several grass species over the course of the study (see, for example, Figure 18). These included rough fescue (*Festuca campestris*), crested wheatgrass (*Agropyron cristatum*), and awnless brome (*Bromus inermis*). The latter was introduced to Canada about 20 years ago and is now widespread in the prairies (Plant Guide, n.d.).

Figure 18

Crested wheatgrass and other grasses at the research site



Note: Photograph taken on Nov. 1.

Though I searched for local Indigenous names for these plant beings, I could not find many, thus could not list them in my introduction of species in the way I could with common names in English and Latin names. However, I acknowledge that there are many names for these

same species in other languages, names that have been spoken in reference to these same creatures for hundreds and thousands of years. Johnston (1970), in his account of traditional Blackfoot uses of plants for food and medicine, includes a few names in the Blackfoot language: grass is *ma-to-yees*, *mat-tu-yis*, or *ma-yak*; spruce tree is *patokh'i*; and pine tree is *paytoki* or *patokh'i*.

Child-Tree Encounters

Inspired by the interaction pattern system developed by Kahn and colleagues (2018, 2020), here I list and describe the various ways in which children most commonly interacted with trees and grasses in the park, which provides a basis for discussing the children's experiences of affective, relational, and embodied connections to these members of the natural world. Kahn et al. (2020) described interaction patterns as "characterizations of essential ways of interacting with nature specified abstractly enough such that the pattern can be instantiated in many different ways, across diverse forms of nature and diverse natural entities" (p. 471). For example, in their work at a nature preschool, they describe such interaction patterns as "Leaning on and Hanging from Supple Tree Limbs" (p. 478), "Climbing High in Small Tree" (p. 479), and "Imagining Nature to Be Something Other Than It Is" (p. 483). In keeping with my theoretical grounding, I describe such experiences as *encounters* rather than *interactions* to acknowledge the agency of the plant beings involved and the mutuality of the experience and adopt naming practices that decenter the child within the encounter.

Trees who Invite Movement

Tree climbing is one of the activities that parents might typically associate with a forest school program. As Jackie noted during the interview, a lot of tree-related play during winter

involves climbing, especially “at the beginning of forest school anyways because it’s such a ... ‘in nature you climb trees’ thing!” (EI, p. 5). She noted that the:

Friday class is big into tree climbing, lots of tree climbing. They’ve had discussions about which trees you can climb. Are they strong enough? Are they big enough? We really try not to have any branch breaking happen during forest school [but] it’s always inevitable. (EI, p. 5)

The following vignette and Figure 19 depict an example of the children climbing and walking along on a fallen tree:

Four of the children were making their way along a fallen tree, several feet high off the ground (see Figure 19). Why and when had this fallen? How many creatures benefited from the shelter provided by the dense branches near the ground? How many children had this tree invited to move along their wide, strong trunk? Julie wanted to follow the three boys ahead of her, but suddenly felt scared and called to her teacher, “Miss Jackie! I’m standing on this tree and it’s kind of scary...” Jackie reassured her that she did not have to climb on the tree if she did not want to. A moment later, Julie asked her for help to get down. Jackie came over and encouraged her to find her own way down, offering one hand for Julie to hold on to. Julie eventually jumped down and then ran off happily.

Figure 19

Children moving along a fallen tree



Note: Still image from GoPro footage, Nov. 27.

This vignette illustrates the type of risky play that was encouraged at the forest school program. Much has been written about children's risky play (e.g., Brussoni et al., 2015; Gill, 2012; Sandseter, 2007), perhaps not surprisingly given current societal debates around safety, liability, and child development. It is widely accepted within the field of outdoor education, and within forest school pedagogy, that climbing trees presents relatively few hazards for children and that the risks present more benefit to the children than possible harm (Finch, 2016). Gull et al. (2017) specifically examined the benefits and risks of tree climbing on child development and resiliency and found that the activity is relatively safe and has the potential for many positive outcomes, concluding that "children involved in risky play such as tree climbing have the potential to grow socially, emotionally, physically, cognitively, and creatively, and have increased resilience" (p. 24). It must be said that Gull et al.'s outcomes have an anthropocentric focus, however. I wonder if these close contact encounters that require heightened senses and

keen bodily awareness might also have the potential for the children to better know a fellow forest being, and vice versa? Trees clearly draw children in to move along their trunks and limbs.

On one memorable occasion, some of the children became quite protective and concerned when one child tried to climb a very small tree who could not hold his weight:

It was a snowy and cold day. During free play time towards the end of the program, Charles walked to a tree and silently bent one of the branches down towards the ground. Joe was nearby and when he saw what Charles was doing, he walked over, saying with concern, "Don't! Please don't rip that whole branch!" Charles continued what he was doing, grabbing the branch closer to the trunk and pushing down again. Joe again pleaded, "No. Don't rip the whole branch! Just don't rip the whole branch," then adding more assertively when Charles didn't stop, "Don't. No. I'm gonna tell on you if you do that. Do you want that?" Meanwhile, Mary the educator and Oliver had walked toward them to see what is going on, then Oliver also and chimed in loudly, "No, no, that tree is not strong enough!" Both Joe and Oliver showed great concern for the tree and tried to stop Charles from accessing it. Mary tried to suggest to Charles that he might want to climb a different tree, but Charles explained that was trying to climb that tree to get a better view to take pictures (he was wearing the GoPro camera at the time).

The conflict continued, with Joe and Oliver protesting, "No, that tree isn't strong enough!," "It's weak," and "You're gonna kill that tree!" Joe even felt the need to use his own body to prevent Charles from breaking the branches [see Figure 20]. Charles then finds another very young tree nearby and says he will climb that one instead to get a view. Mary tries to help him understand that this tree may also be

too thin. Joe then adds, almost pleading with Mary, “No, no, no. It’s too weak, he’s gonna bend it and rip the whole tree down!” Oliver, stepping right over to Charles, tells him, “No wait! That tree’s too wiggly! You’ll rip it and knock the whole tree down. You’ll fall!” Finally, Charles decides to find another place to climb and get a view.

Figure 20

Oliver and Joe try to protect a young tree who Charles wants to climb



Note: Still images from GoPro footage, Nov. 20.

In this vignette, the children entered into a discussion on their own terms about climbing particular trees. Charles was rarely observed tree climbing, and it is unclear whether he would have gone through with his idea if the others had not stopped him. What is interesting is the very visceral reaction of the two boys to Charles’ actions with the small tree, how they expressed their fear that the tree would be hurt, and their commitment to protecting the tree through involving a teacher and going as far as creating a barrier with their own bodies.

A diffractive reading of this vignette and accompanying pictures can illuminate this moment further. How are the tree and children’s bodies connecting and overlapping in a relational and horizontal way (Hultman & Lenz Taguchi, 2010)? The small tree offers certain

possibilities to the children. One is the possibility of climbing, although this may have resulted in both parties getting hurt. Another is the possibility of being wrapped/hugged. The children seem to consider both. The tree does not move as humans do but sways in the wind, bends, grows, and changes. The children respond to the tree's shape and position (i.e., near the play area) by intentionally engaging with this other type of being. The children that wrap themselves physically around the young tree in an attempt to block another from harming the tree, and in that time share a connection mediated through the winter clothing of the children. Bark-mitten-hand, branch-jacket-body, these encounters are examples of entangled lives enmeshed with matter. Could the children's consideration of the tree's wellbeing be a form of empathy?

Bodily Entanglements with Trees

Like in the earlier vignette about Charles trying to climb a small tree, the children sometimes bent, touched, or leaned on a young tree or tree branch, occasionally breaking off thin branches without an evident purpose other than the act itself. As Jackie mentioned in the interview, there was what seemed to be inevitable branch-breaking during the program despite efforts to be respectful of the park trees. One day, George was leaning heavily on a young tree when a part broke off, which led to a group conversation:

It was the beginning of the program and Jackie was taking attendance and conducting a safety check with the children at their usual spot. George seemed restless and appeared to need to keep his body moving, so he was standing near the group, next to a small tree who he had been leaning on and hanging from for a few minutes. Julie's GoPro was filming and a sudden loud "crack" is heard. Jackie says, "Oh no! Our poor tree!" Sean is heard saying, "He killed it!" Jackie reminds the children that is important to be gentle with the trees. Charles asks, "Did that

tree fall down?” to which Jackie replies, “I think so.” Joe jumps in quickly, “No. He standed on it and then it fell down.” Jackie explains that George was leaning on the tree who then fell down, which sometimes happens. She then brings the conversation back to the safety check by reminding the children that some trees are good to lean on and climb, while others are too small for that.

Not all of the tactile interactions with small trees were destructive. In GoPro footage captured by Charles, he is seen embracing a small spruce tree while talking to an educator (see Figure 21). What might children’s touch, pressure, body weight, breath, and clothing feel like to the tree? Black (2020) reminds us that touching tree bark is a mutual experience for both the child and the tree.

Figure 21

Spruce tree touches hands in mittens



Note: Still image from GoPro footage, Nov. 20.

Wohlleben (2016) explains that tree bark is very similar to human skin in that it fulfills some of the same functions such as protecting organs from the outside world. In terms of *sensing*, however, that may be more in the realm of the tree’s roots; as Wohlleben (2020) explains to

young readers, trees “can feel more through the tips of their roots than we can with our fingers” (p. 18). We cannot know what the tree’s experience of an encounter with a child is like, but we can surmise that when trees lose a limb, they are surely affected in some way.

Imaginary Play in a Den

One of the main play settings was a den. This den had been created by attaching a few large branches with twine to a small stand of balsam poplar trees (see Figure 22). Whether the trees invited the children to create a play space, or whether the trees beckoned to the teachers when they were selecting a main “spot” for the groups attending the program is unknown to me, but certainly this stand of trees showed potential as a social and play space and became a favourite location.

Figure 22

Balsam poplar trees where the den was situated



Note: Photograph taken on July 12.

Figure 23 shows five of the children in the den at once and Figure 24 shows Oliver dangling comfortably from the den. The children could climb up various ways and feel high up

while not facing a serious risk of injury from falling. Spending time at the den was common during the free play portion of the forest school sessions and the play themes varied. The den allowed children to experience heights as well as bodily movements such as dangling, climbing, and sitting.

Figure 23

The den was a common play area



Note: Photograph taken on Oct. 30.

Figure 24

Oliver chatting with his friends while hanging from the den trees



Note: Still image from GoPro footage, Oct. 30.

The den inspired the children's imaginary play. For example, they would pretend to have a viewpoint to keep an eye out for "thieves" or "mice coming in" or "bad guys." At one point, Julie had her "computer" on the trunk of one of the trees to help monitor for "bad guys." The GoPro captured many instances of the children climbing up and playing in the den – on two of the days, there was over 20 minutes of play at the den captured on video. Den and fort play is common in outdoor education programs for young children (Leichter-Saxby, n.d.). Since the forest school programs do not run during the summer, the den is dismantled and returned to its more natural state in the spring. The stand of balsam poplar trees is seen in Figure 22 when out of their dormancy and in their full summer vibrancy in a photograph I took after my time with the children ended and after the den had been dismantled. The strong trees withstood many hours of climbing and vigorous play over the course of that school year.

Possibilities for Empathy

The examples of child-tree encounters I shared above showcase a variety of ways that children had direct physical contact with trees, often with their whole body. When engaged in imaginary play or when using trees as a support for ropes or materials, it seemed to me that empathy, care, and stewardship did not seem to be at the forefront of the children's minds, for the most part. However, there were many discussions on this topic. One example is the vignette that describes Charles wanting to climb a small tree and other children defending the wellbeing of the tree and preventing Charles from climbing. Interestingly, the children mainly had this discussion amongst themselves, with educators only playing a minor role in directing that particular debate. In another instance, I was walking with Sean and recorded this conversation:

Sean [talking to me]: "That tree that's cut down." (He points.)

Elizabeth: "Yeah?"

Sean: "Still in the ground."

Elizabeth: "What does that mean if it's still in the ground?"

Sean: “Ugh, it’s a tree, but it, umm. Umm. But some people think it’s a stick. A long, long stick.”

Elizabeth: “Oh. What’s the difference between a tree and a stick?”

Sean: “Uh. Well, they’re actually the same thing.”

Elizabeth: “Okay.”

Sean [continuing]: “But trees are stuck in the ground. Also some sticks could be stuck in the ground.”

Elizabeth: “Is it okay to break sticks and to break trees? Or are they different?”

Sean: “Well if they’re dead, it’s okay.”

Elizabeth: “If they’re dead, it’s okay?”

Sean: “Mmhmm.”

Elizabeth: “But we don’t want to break them if they’re alive, right?”

Sean: “Yeah.”

Elizabeth: “Why not?”

Sean: “Well... if ... if...the branches are strong enough for us, then, then it’s okay.”

Elizabeth: “Then it’s okay because then the tree will be okay?”

Sean: “Yeah. Because then you can, like, climb on it.”

Elizabeth: “Yeah! You can climb the tree if it’s safe enough and it won’t hurt the tree, right? Is that what you mean?”

Sean: “We have a tree in the backyard but we’re not allowed to climb it.”

We continue talking about his tree who lives at his home. (HC, Nov. 20)

What is clear from this short conversation is that Sean is aware of how his actions could have a negative impact on a living tree, but that climbing dead trees is acceptable. This perhaps demonstrates an anthropocentric stewardship approach, since trees should be protected not for their own sake, but so that they can be climbed on later. How might these types of informal conversations open up “space in which children might imagine and care for other worlds” (Mycock, 2019, p. 3)? Could consideration for the integrity and wellbeing of a tree be a form of empathising?

I also observed a few spontaneous conversations about whether certain activities would hurt trees. These seem to have been led by one particular child, Charles, on different days. During one period of free play, Charles and Jackie were having a discussion while Jackie was sawing a stick.

Charles, picking up a medium-sized rock, asked: “Can we throw rocks at trees?”

Jackie: “What do you think?”

Charles: “Yes.”

Jackie: “Okay.”

Charles: “Does that hurt them?”

Jackie: “I don’t know, what do you think?”

Charles: “Yes.”

Jackie: “Yes, it hurts them?”

Charles: “It does *not* hurt them.”

Jackie: “It doesn’t hurt them?”

Charles then stands up and throws his rock toward an area with some young trees. The rock hits a tree, making its thin trunk and brown leaves shake for a moment but it resiliently withstands the blow. “I threw it at a tree!” he declares.

Jackie asks if he think it hurt the tree? “No!” he answers. (GP, Dec. 18)

Charles also commented, on a different day when he was making a “trap” with rope, and narrated that, “We’re allowed to tie ropes to trees because ropes don’t hurt trees” (GP, Nov. 27). In these various examples with Charles, it is evident that he was considering how a tree might *feel* and how his actions may or may not hurt a tree. I found a similar comment in a study by Porto and Kroeger (2020) when a researcher and group of children were having a discussion about nature, with one of the children stating that it “hurts the tree” (p. 865) when they are cut.

An example with a different child, Oliver occurred when we heard a loud noise that he imagined was a chainsaw; in response, he invented an imaginary play scenario where the group were the “protectives” responsible for protecting trees who were going to be cut down in the park. In that moment, Oliver felt compelled to take action and suggested to the others that they could save the trees, akin to their occasional superhero play. In my later interview with Jackie, she noted that Oliver was the child in the group who demonstrated the most connection to the natural world and the more obvious desire to act and care for nature: “He has a lot of knowledge... like if people are squishing ants or getting too close to ants’ houses, he’s the first one to say stuff about them, but it’s usually in a protective way. ... so I would say Oliver definitely shows a lot of caring and connection to the natural world” (EI, p. 8).

In these various direct, indirect, or symbolic encounters between children and trees, there was a co-mingling, co-shaping, and a process of collective worlding (Haraway, 2016). Through imagination, the children explored what it might feel like to be a tree, or what might hurt a tree. Meanwhile, the trees lived on in the park, in contact with a myriad of living beings and materials, also experiencing shared moments with children.

Child-Grass Encounters

A few specific interaction patterns (Kahn et al., 2018, 2020) occurred when a child came together with grass for a shared moment. The grasses, as previously noted, were not growing at this time of year. They were dry remnants of the previous season's growth, although below ground these plants were strong and healthy and the following spring the perennial nature of these plants would bring forth plenty of new grass leaves. During the interview with Jackie, she noted that since the snow had melted, the grass had been available as a key type of plant with which the children could interact for a relatively long period during my study. She observed, for example, that the children had "collected a lot of the grasses [and used it as] hay" (EI, p. 5). During four days of my own observations with the children, grass played an important role in their forest school experience.

Grass as a Playful Partner

Grass was sometimes used as a loose part during kitchen play. For example, during pretend play at the den, George decided to make pasta by pulling up grass and putting it into a bowl to make a "trap" for the "bad guys." I also observed the following: "Charles is picking grass with his hands and then putting it in a pot with water" (FN, Oct. 30). He was enjoying stirring the grass and water in the pot (see Figure 25).

Figure 25

A pot of grass and water become pretend food



Note: Photograph taken on Oct. 30.

Grass also became wheat through pretend play as this observation indicated:

On one day, Julie asked Joe, “What do we need grass for?” to which Joe responded, “It’s wheat!” Julie then asks, “What do we need wheat for?” and Joe replies, “To make bread.” The children then compared their personal experiences with making bread at home with a parent/caregiver. (FN, Nov. 6)

The children also would store their wheat in the den. I noted an interesting parallel to the name of one of the grasses – crested wheatgrass – even though the children did not know how to identify the grasses (see Figure 26). Grass is easy to carry, bends easily, offers interesting textures, and was abundant at the forest school site. Children’s imaginations were activated through their play, and with few conventional toys around, the grass participated in play through symbolism. Combining grass with water also offered a very sensorial experience for children’s hands.

Figure 26*Crested wheatgrass*

Note: Photograph taken on July 12.

Cutting, Collecting, and Naming Grasses

The children seemed to enjoy cutting grass with scissors (see Figure 27). Sometimes this did not seem to have a purpose other than the grass-cutting process in itself, while other times the cut grass was collected for play or to observe as a group. For example, I recorded the following in my field notes:

At the end of this day's program, Jackie says that she has one last activity for them to do. She calls all the children over and up a little bit from the path. She says they'll be cutting grass. She suggests that they look for as many types of grass as possible, and bring back anything interesting to share with the group. She gives each child some scissors. This is based on their previous interest in cutting grass.

The children cut grass quietly, some staying nearby, while some like George go further away. (FN, Nov. 13)

Figure 27

Julie cuts grass with scissors



Note: Still image from GoPro footage, Nov. 6.

In this instance, grass-cutting was an adult-led activity that was based on children's interests and was used as a calm and quiet activity to end the day's program. After cutting grass for a few minutes, they gathered and compared the grass they had collected. They noticed some grass with "swiggles" and some that looked like "pasta." The following week, Jackie once again led the same activity. I noted: "As the last activity of the day, Jackie again gives them scissors to cut grass. They are challenged to find the longest piece of grass or the 'pasta' grass from last week" (FN, Nov. 20).

A diffractive analysis of these child-grass encounters and the pedagogical approach around naming helps to gain insight into these experiences. As mentioned earlier, this group of children did not seem to know the names of the plants in the park. Other research suggests that

young children have less knowledge generally of plants than of animals (e.g., Archer, 2014). Patrick and Tunnicliffe (2011) write that:

Young children, worldwide, have an innate interest in plants, but as they grow older their attitudes change and they do not notice plants and do not believe plants have value ... This phenomenon of ignoring plants as if they are not there is referred to as *plant blindness*. (p. 632, emphasis in original)

They further explain that one of the reasons for this is that plants are often described as “immobile, faceless objects” (p. 632) by teachers, which leads to a view that plants are inferior to animals. Yet, as Patrick and Tunnicliffe (2011) suggest, “rich experiences can greatly contribute to [children’s] knowledge about [both] plants and animals” (p. 640). In 2014, the American Society of Plant Biologists published a position statement on the education of young children about plants that “urges the educators and parents of young children to actively promote learning about plants and to create formal and informal opportunities for them to explore and experiment with plants” (Archer, 2014, p. 575) given the generally low knowledge, and many misconceptions children hold of plants.

Observing the children cutting grass with scissors, collecting, and examining the grasses without identifying them made me wonder whether knowing more about plant companions, including their names, could be an avenue for developing a connection with plants, perhaps opening up possibilities for curious observation and paying closer attention to these beings who often go unnoticed. Pelo (2013) suggests that the absence of names can be a “barrier to intimacy ... When we don’t know what we see, who we hear, where we walk, we don’t know, really, where we are. Names are integral to relationship” (p.105). Yet, writing from an Indigenous perspective, Kimmerer (2013) reminds us that often when we attach scientific names to plants

and animals we stop “exploring who it is” (p. 208), which echoes some writing by environmental educators who have discussed the ways in which memorization of species names and the practice of listing can detract from the building of relationships (see Bell, 1997).

The use of names in environmental education thus is complicated (Bell, 1997; Pelo, 2013), and naming practices are fraught with historical and political tensions. For example, as Nxumalo (2015) writes, “The very naming and classification of the trees according to Eurowestern taxonomies is itself not an innocent practice and is entangled in specific colonial worlding histories and practices that privilege particular ways of knowing the world” (p. 28). The same would apply in this case to grass names. Yet names, even made-up names, can be useful for communication purposes. Pelo (2013) suggests that

...the knowledge of names binds a community together. When we hold in common the names of the places where we live, and the names of the beings that live there with us, we can speak together of our life in these places with these creatures. Our conversations have depth and nuance, they are particular in their details (p. 107)

Perhaps, then, Jackie exploring grasses with the children through inquiry and using imaginary names for them based on observations, such as “pasta grass,” rather than asking students to memorize species names helps facilitate connections with the natural world in a more affective and meaningful way.

A Vignette Featuring Balsam Poplars

To end this chapter, I reflect on the child-tree and child-grass encounters that I observed. Playing in the den was so enjoyable for the children that it captured my attention, and it is easy to lose focus on anything other than the children when the other living beings are so still.

Decentering the human in multispecies ethnography is indeed an ongoing challenge (Pacini-Ketchabaw et al., 2016).

In the following vignette, I used my imagination and my sense of empathy, which has been informed by natural history information, to feature the balsam trees *themselves* as opposed to the trees as *objects* the children used in their play and learning.

Balsam poplar trees have known the park for many decades. One particular stand of trees offered their sturdiness to children who built a den amongst their branches during the school year. While they rested during the colder months, they invited children to climb, dangle, hug, and touch them. They invited the children to use their imaginations as they played, and they invited birds such as chickadees and flickers to perch nearby to keep the children company and remind them that the park is shared with a multispecies assemblage of beings. The balsam poplars also offered many of their branches as sticks for dogs and children to enjoy in the park. They offered their trunk as a backrest during my sit spots; there is something comforting about sitting under a tree rather than out in the open. In the fall, they offered the leaves they no longer needed as a gift to the soil. In the summer, reinvigorated by the longer daylight hours, the trees grow new leaves, photosynthesizing once again. They would happily provide shade to any who needed it and produce food as gifts for many animals. How many seasons had these balsam trees experienced? Were they 40 years old in human years? 50? 60? These tree people stood in place, living their tree lives, encountering a diversity of other beings, experiencing weather and landscape along with the animals that lived or frequented the park. Although silent to our human ears, they actively participated

in teaching children attending forest school or otherwise frequenting the park many important lessons.

Wohlleben (2020), in his popular writing on the lives of trees, writes:

It's likely that old trees and stumps can remember things that happened long ago.

They've experienced a lot that they can pass on to their younger family members.

They may have learned, for instance, how to share the water in the soil during a dry summer so that no trees will die of thirst. (pp. 18-19)

Might viewing plants as wise, knowledgeable beings change how we respond to them and how much interest we have in them? Might moving away from a reductionist and objectivist perspective of plants as immobile *things* help us learn from and with them? Kimmerer (2013), a botanist and member of the Citizen Potawatomi Nation who blends her traditional and cultural knowledge with her scientific knowledge of plants and ecology, reminds us that, “after all, plants were here first on the earth and have had a long time to figure things out” (p. 210). She describes plants as our oldest teachers, which is a common perspective within Indigenous worldviews. As well, in some spiritual practices such as urban shamanism, plants are described as “masters” and spiritual teachers (Carvalho et al., 2020). In such perspectives, knowledge is seen to reside in the natural world (Carvalho et al., 2020). Perhaps in the case of this study, tree and grass beings can therefore be seen as co-teachers.

I also want to extend my own gratitude for the many gifts these beings provided. These were not the medicine and food that would have been essential gifts for the survival of the Blackfoot and other Indigenous Peoples living on this land before colonization, but there were other gifts for the educator and children who enjoyed time in, on, and under the trees. Some of the tree's gifts were personally important to me. I saw the swaying grasses as I sat in the park,

watching them move beautifully in the wind and I was grateful. I felt the gift of relaxation and peacefulness that sitting in nature provides me, which was sorely needed as a busy graduate student and college instructor. I also appreciated the gift of fresh clean air, which was cool and crisp on those fall days.

Conclusion

In the *Research Handbook on Childhoodnature* (Cutter-Mackenzie-Knowles et al., 2020), an entire section comprising 11 chapters is devoted to “Childhoodnature Animal Relations” but no section nor even a chapter in this 81-chapter book is specifically focused on children’s relations with plants of any kind. While trees and other plant beings have been included in discussions of children’s relations with place such as in Nxumalo’s (2019) work on forests and gardens, they rarely are the focus of common worlds explorations. In contrast, in this chapter, I have described the specific ways that children encountered and intra-acted with trees and grass.

Kahn et al. (2020) aim, with their interaction pattern system, to “reinfuse in our world an alive nature language that is based on our actual experiences with our encounters with a living nature and an infusion of our being into the wider and wilder energies and consciousness from which we come” (p. 489). Given that more attention has been given to child-animal relations in common worlds research, it felt important to focus on child-plant relations and explore various ways in which children, grasses, and trees were entangled.

Based on the set of encounters I observed during my study, several ideas come to mind. First, while I noticed only a few instances of empathy for plant life, they did occur. Given the species gap between humans and plants may feel greater than the gap between humans and other animals with whom we share more in common, that in itself may be noteworthy. Reflecting or discussing the lives of plant beings such as trees and grass did not seem to be prominent during

the period of my study, although instances such as Charles wondering if rocks hurt trees, and when Joe and Oliver protect a young tree so the tree did not get broken demonstrate that these are indeed possibilities that can arise at forest school. Interesting to me is that these more empathetic encounters with plant beings were not led by the adults but rather came up spontaneously. Having explored the children's embodied connection to trees and grass, I now turn to a chapter that examines the role of weather and landscape in shaping children-nature relations and encounters over the course of my study.

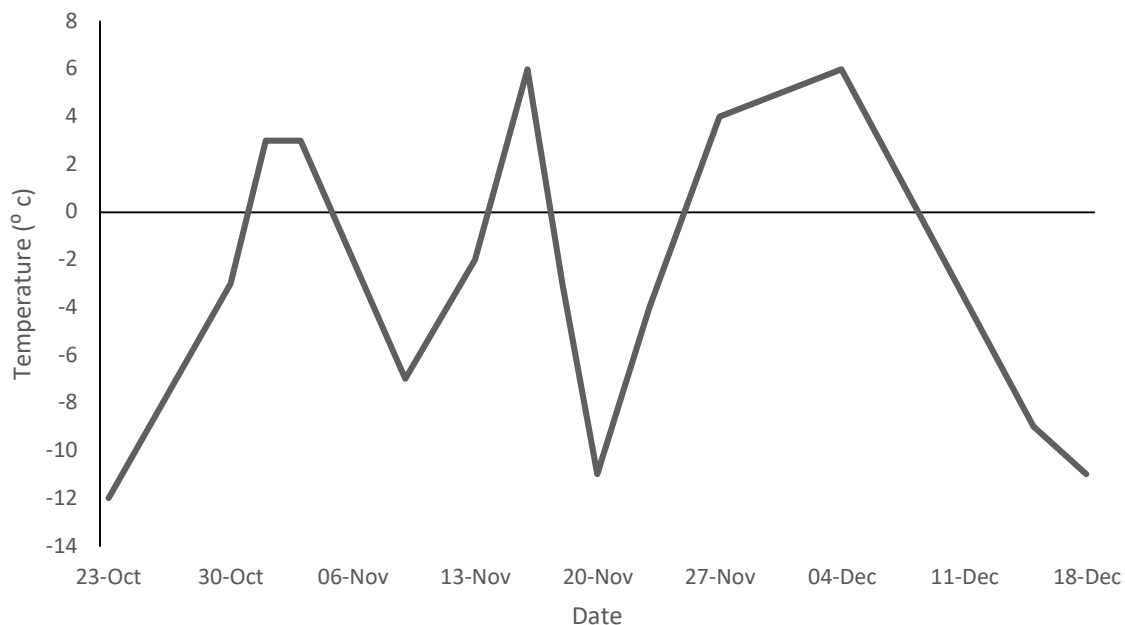
Chapter 6: Experiencing Weather, Place, and Landscape

During the months I conducted my observations, October to December, the plants and animals in the park were experiencing fall weather, which can vary drastically in this area.

Figure 28 shows at a glance the temperatures I recorded during my observations. I share it to give the reader a sense of what it felt like, which could help contextualize this chapter. Wildlife activity was limited due to many species migrating to warmer climes or settling into hibernation or dormancy to survive the winter, and the deciduous trees and many other plants did not have much foliage nor were they flowering. Grasses from the previous season were in abundant patches while in other parts of the park the soil was bare. The ground was at times covered in dew or fog, and sometimes in snow.

Figure 28

Recorded temperatures during the period of study



Weather and seasonal conditions were important forces intra-acting with humans, non-humans, and materials in the park. The landscape also shaped the forest school assemblage by

inviting children and animals to engage with spaces in different ways. Notably, the steep bluff and the cold snowy days created affordances for how a place could be experienced. In this chapter, I describe how weather affected human comfort levels and Jackie's program planning as well as the primary affordances of the landscape, and how these embodied experiences connected to learning about climate and climate change, making connections to other work by common worlds researchers (e.g., Blaise et al., 2019; Neimanis & Walker, 2014; Rooney, 2018).

While I did not often include weather and landscape features in my preliminary coding, it became clear to me that these were important in understanding the children's experiences with the more-than-human world, just as they are in other outdoor educational experiences. Writing down notes about weather and landscape perhaps seems so commonplace and obvious that I suspect it can sometimes get missed by researchers, just as I initially did not think about including it in my coding. In hindsight, of course these features showed up in every single video clip as well as when I recorded the temperature when I was doing observations.

Weather Worlding in Alberta

Alberta's climate is continental and ranked by Hume (2008) as the most comfortable in Canada, although I imagine not all Canadians would agree with that assessment. Here is it important to differentiate weather from climate. Climate "refers to long-term overall patterns and averages, which are different from place to place, and are – compared to weather – relatively stable and predictable" (Climate Atlas of Canada, 2019, p. 4). Climate determines what kind of weather to expect in a region. In Alberta, landscape shapes weather; Hume (2008), in *Weather of Alberta*, explains:

The Alberta land surface, of course, plays a role in the global energy balance.

Alberta's land surface is a mixture of forest cover and grasslands with a relatively

small proportion of water surfaces and non-vegetated terrain in the mountains and badlands. ... The mountains in Western Alberta play a large role in drying out moist air moving from the west. The mountains also act to help “dam” the movement of cold, dense air from the west. As a result, Alberta is subject to large temperature extremes, from the highs under cloudless summer skies to the frigid cold snaps that occur with low sun angles and clear nights in winter. (p. 14)

One of the unique weather phenomena in Alberta are Chinook events. These occur when maritime air moves east, hits the Rocky Mountains and then lifts, which cools the air parcels, “usually leading to condensation of the moisture, which is then precipitated out of the air on the upslope ranges” (Hume, 2008, p. 23). The air then moves down the mountain, warming. Chinooks can appear quite rapidly, and “the effect is most pronounced when a cold arctic air mass has been resident for some period of time” (Hume, 2008, p. 24). During my multispecies ethnography, at least one Chinook occurred as was noted in the CTV weather news (Stanfield, 2020); that meant sometimes the weather was quite mild before plunging down to colder days. I noted in my research journal: “It looks like the Chinook is here for two more days then the temperature drops to zero and below for a while. I wonder if this makes it easier or more challenging for animals to overwinter?” (RJ, Nov. 3).

Weather, Comfort, and Outdoor Pedagogy

There is no doubt that to be comfortable outdoors in Canadian climate, humans must plan for bodily needs and dress appropriately. Given that my second research question relates to forest school pedagogy, the outdoor setting, and children’s embodied connections to the natural world, discussing child-weather relations with a focus on children’s experiences and how it is facilitated by the adults around them is fitting. In the case of children aged four and five, their parents were

responsible for providing them with extra layers, mittens, hats, and the like in order for them to be comfortable outside for two and a half hours even when the temperature was below freezing. I observed the children to be very resilient and rarely heard complaints about cold, although there were sometimes matter-of-fact statements such as “My hands are cold” which presented opportunities for the children to independently take care of their needs. On one day, however, a child did seem to be quite cold. The temperature, with windchill, that morning was minus 17° Celsius. A conversation between Julie and Joe is heard on the GoPro recording:

Julie: “Come on!”

Joe: “No, I’m too cold... (unclear)...”

Julie: “Well, you have your warm stuff on.”

Joe: “It’s just, it’s just, they don’t work. They don’t work.”

On this particular day, I noted in my field notes:

One child, Joe, has been crying for a while. He seemed “off” from the start and the parents had mentioned that they could pick him up if he wasn’t doing well. Jackie tried to get him moving and then comforted him but eventually she called his parents. Joe waited as best as he could until his parents came about halfway through the program. Jackie had commented that he might not be dressed for the weather, but when I asked him personally about that, he pointed to his side as if it was hurt.
(FN, Oct. 23)

The following week, he was fine and on subsequent cold days I noticed he was wearing warmer snow gear.

With children running and being physically active, their body often stayed surprisingly warm, which may be why it would be difficult sometimes for a parent to gauge how to appropriately dress their child. I noticed this particularly when I was sitting doing observations while the group was active, creating contrasting experiences:

When the group was doing running and moving games to stay warm, I was not participating so I didn't have the chance to warm up. My toes got quite cold.

(Sitting here typing this with a hot water bottle on my feet and a hot chocolate!)

Yet in keeping with my role [as a nonparticipant observer], I had to skip the running around. I did move around on my own around the site. (FN, Oct. 23)

It was clear that on colder days, the children had to keep moving almost the entire time to stay warm. Some children also would have toe and hand warmers inside their boots or mittens, and I occasionally did the same given that my level of movement was typically less than the group's. For example, I wrote in my notes one day: "My toes are getting cold so I decide to add toe warmers to my boots so that I can stay warm and am not distracted for the rest of the class" (FN, Nov. 13).

The children were not always able to articulate how they felt with regards to the temperatures. In the following vignette, Oliver explains his fluctuating body temperature and his frustration with having to stop climbing the hill because it made him too hot in his winter gear:

It was -15° Celsius with the windchill on this day. Oliver had been vigorously playing on the steep hill, sliding and tumbling down with his friends, and then climbing back up, which required considerable physical effort. He climbs up one last time, with help from a rope, and joins Jackie, Joe, and Charles who are sitting in the snow and using a hand drill on a stick. Jackie asks him, "How's it going, Oliver?" "Good," he replies. Jackie continues, "That's a lot of work going up and down that hill, isn't it?" Oliver sighs and leans back, the GoPro showing a view of the sky and high tree branches. He rests for a moment, then explains that he is hot. Jackie encourages him to take a break but he then tries to explain that he doesn't

like having to take breaks: “That’s the problem, the hots make me take a break, but I don’t want even – but I even don’t want to do that.” He continues a moment later, “Hot isn’t warm. I need to be warm, but hot isn’t warm. Hot is not warm, and I need to be warm, but I am hot! But hot is not warm and I need to be warm.” Jackie, paraphrasing his words, then asks him for ideas on how he can get warm when he is hot, and he replies, “Have a drink.” She acknowledges the good idea and has a drink of her own water bottle, modelling the suggested solution.

Murris’ (2016) concept, *bodymind*, comes to mind here in relation to this vignette. Murris suggests that thinking is embodied and transcorporeal and that all human animals (including children of course) are bodyminds. Through this lens, Oliver’s thinking can be seen as depending “not only on the *existence* of bodily interaction and communicative relationships with other human animals, but also on material conditions” (p. 7, emphasis in original). Though Murris does not discuss the specific context of children outdoors, it seems particularly suitable to consider the importance of embodied thinking and learning outdoors, given the important impact that weather has on one’s bodymind. Oliver could not separate his bodily experience from his cognitive process. He was unable to continue playing and vigorously engaging with the hill until his bodymind was comfortable once again. At the end, Jackie guides Oliver into discovering for himself what his needs are in that moment.

Throughout the study, Jackie helped the children develop independence by encouraging them to take care of their own needs, with her guidance. Her role on cold days included monitoring their wellbeing and safety. I asked her during the interview how weather impacts the children’s experience of forest school since I had noticed how different the programs felt in relation to temperature and weather conditions. She explained that she must pay keen attention to

the children's body temperature and plan accordingly. On one day she noticed the children naturally doing a lot of running and staying warm that way, so she just encouraged that for the rest of the program. She reflected that, on another day:

We did a treasure hunt, we sat down to paint our jewels, and I could see the body level temperatures just dropping, like you know, hands start to get cold more and more of the hunched stuff [she demonstrates a hunched over position on video], so then I was like, "Ok guys, free time after you are done, whatever you want to do!" And they went, they just moved for the rest of the class until we came back for snack. (EI, p. 7)

She also explained that she adapted plans as needed, for example by skipping activities that required longer periods of sitting or altering them to completing the activity while walking. She noted how the weather changed the flow of the day dramatically, remarking, "As a teacher, I plan so many more things if it's cold than if it's not. So they probably have more chance for free play, more natural provocations, whereas on cold days I am more in charge" (EI, p. 7). I noticed that on warmer, sunny days, the children were more engaged in imaginary play with each other and were happy to sit for longer periods of time doing, for example, art or tool use activities. This echoes Bartnæs and Myrstad's (2022) findings that "forces in the snow influence the rhythm and flow of the children's movements" (p. 86) in a kindergarten program in Arctic Norway.

Blaise et al. (2019), working within a postdevelopmental and common worlds framework, propose "weather wanderings" as a way to disrupt the child-centered approach to weather in early childhood education. They note that in early childhood teaching practices, weather tends to be seen as external; for example, a teacher might discuss the weather while the

class is inside and often look out the window to check for current conditions. Blaise et al. note that, “Often, if these weather conditions are considered to cause discomfort (it’s too windy, it’s too cold, it’s too hot, etc.) then a decision is made to stay inside” (p. 166). Of course, in the case of an entirely outdoor program like the forest school in my study, weather is not experienced that way, but more viscerally through the body’s senses.

Indeed, in this forest school, weather is part of the children’s everyday outdoor experiences. For example, one day Jackie decided to discuss clouds with the children:

Jackie leads the safety check with the group. She introduces a new aspect of checking for the sky conditions by showing them a book section about different types of clouds. She reads out the name of each type of cloud and asks the children to look up to see which kind of cloud is there. (FN, Nov. 20)

In this example, Jackie encourages the children to observe, identify, and wonder what type of clouds are with them that day. In line with Blaise et al. (2019), children are seen as being “always on the move with-weather” (p. 166) and the discomforts of weather are seen as “generative and always entangled, rather than something to avoid” (p. 166). Although Jackie had access to an indoor space, it was never used on my observation days, so even on cold days, the group did not shy away from the weather. The educator, the children, I as the researcher, along with all the creatures at the park, were what Blaise et al. would call “weather bodies,” co-creating our weather experiences.

Intra-Actions with Features of the Land

Part of the forest school edict is to return to the same outdoor location on a regular and repeated basis to form a bond with the Land and allow for a place-based approach to education (Child and Nature Alliance of Canada, 2020). By returning, each week, to the same park, and

even the same spot in the park, the children's sense of comfort and belonging may be enhanced. Jackie explained that while the group navigated throughout the park, she felt there is a sense of comfort in having a home base:

We have multiple places in our spot and they [the children], to me, they interact differently in a new spot versus an old spot. The new spot is kind of chaos. Our spot, it feels like home, the boundaries are there. (EI, p. 10)

Each forest school session usually started by the group hiking up to the "spot" where the children and Jackie would leave their backpacks. Other areas often utilized during the program were the paved path, the mountain bike track, and the hill slopes. These all have very different characteristics and invited children's experiences in different ways. The paved path, being a flat and open space, often invited games of coyote-mouse. It also provided children with more frequent contact with other humans and with dogs who were walking through the park on the main path, as depicted in the following example: "Charles is directing traffic on the path. He stands in the middle with his arms out and tells people which side to walk on – even strangers walking along or walking their dog!" (FN, Nov. 20). The bike track (see Figure 29) invited children's imaginary play about superheroes or based on the popular show Paw Patrol, perhaps influenced by the exhilaration of running up and down through the purposefully created mounds and hills, and the privacy of the space at the bottom of the hill that is surrounded by trees. The hill slopes, also commonly utilized, encouraged sliding and climbing up, sometimes guided by a rope to help when it was icy or very steep.

Figure 29

The mountain bike track area



Note: Still image from GoPro footage, Dec. 18.

As was found in an ethnographic study of a nature kindergarten in Norway, these different areas and landscapes “were not sceneries, but emerged as lived experiences and socio-cultural settings for situated learning” (Jørgensen, 2017, p. 490). Indeed, the type of play that took place here was also inspired by the landscape. For example, the bike track and hills were most suitable to whole body movement and physical play, whereas the flat areas were good sites to set up a tool use area, art area, or for reading a book to the group. Indeed, the fact that children saw different opportunities in different areas is demonstrated by their naming practices, as described by Jackie:

Most of the things are named after what we do there, like the sliding hill, the *big* sliding hill (*laughs*), yeah. Well, it is really all based on just what you’re doing at that spot and that’s what they call it. (EI, p.10)

Further, the landscape features seemed to offer different affordances to the children. The theory of affordances was first introduced by Gibson (1979) as a sidebar in his book, *The Ecological Approach to Visual Perception* that discussed how animals see their environment based on possible actions. According to his theory, “affordances are determined by the physical properties of the environment relative to the action capabilities of the animal” (Withagen & Chemero, 2012, p. 524). This idea of affordance is central to forest school pedagogy (Barrable & Arvanitis, 2019) since play and learning opportunities greatly depend on what a particular setting has to offer children, given that the setting is not indoors where the space is more fully organized by the teachers and toys and other materials are provided. The idea of affordances has been picked up by many researchers examining outdoor play and learning (e.g., Bartnæs & Myrstad, 2022; Lerstrup & Konijnendijk van den Bosch, 2017; Sharma-Brymer et al., 2018), which I find particularly interesting given the original idea was grounded in how non-human animals use their environment.

Lerstrup and Konijnendijk van den Bosch (2017) applied the concept of affordances in their two-month ethnographic study of two preschool settings in Denmark. They suggest the following definition of affordances: “the meaningful action possibilities of the environment” (p. 49, emphasis removed). Relating this definition to my study, the hillside covered in grass and snow can be seen as affording children the possibility of sliding and climbing. It was a meaningful action to the children as it allowed them sensory experiences and to engage in social play, physical play, risky play, all while increasing their self-confidence and gross motor abilities. As Lerstrup and Konijnendijk van den Bosch (2017) suggest, “activities in a varied and changing environment lead to varied experiences and knowing” (p. 57). The park certainly offered a changing environment and a variety of landscape features and affordances.

In some cases, one of the most appealing aspects of the natural landscape for children is trees since they offer so many different affordances. Laaksoharju and Rappe (2017), who examined the affordances provided by trees, write that: “A tree is a tree, but for children, trees are a resource. With the versatility they provide, trees increase children’s openness to affordances towards self-actualization. The ways children utilize tree affordances reflect their connectedness to place” (p. 158). Laaksoharju and Rappe argue that trees help children develop a sense of place through the actions they take and experiences they seek alongside trees, which over long periods of time as children become more comfortable with the setting, can help them shift from what they term “outsiders to insiders” (p. 158) in relationship with the natural world. Thus, in play-based and place-based educational programs like forest schools that embrace outdoor experiences and risky play, children may have more opportunities to physically engage with trees and to potentially develop a deep connection to place and the land than they would in indoor programs. As was evident in Chapter 5 (and will be evident in a section of Chapter 7), trees – and by extension sticks – provided this particular group of children with many affordances for whole body and sensorial engagement with an important feature of the landscape.

Since the hills in the park presented an important way for the children in this study to connect to the landscape, I thought that this would be an aspect worth further exploring. On the very first day of the study, I noticed the children sliding and climbing down the bluff and noted:

The group is climbing a long red rope along the steep snowy slope. They enjoy sliding down and then climbing up, which is a challenge as the mittens slide along the rope and the ground is steep and slippery. Jackie asks the group what mountain they are climbing since, with the snow falling and all their winter gear, it looks like they are climbing Everest! (FN, Oct. 23)

On that same day, the group also slid down a different part of the hill, leaving their traces in the snow, as seen in Figure 30.

Figure 30

Traces of children on the hill



Note: Photograph taken on Oct. 23.

On one cold day, the group did not make it up to the regular spot, and instead played along the hill next to the paved pathway. At one point, I decided I would slide down myself and afterwards wrote:

I slide down the hill (as the children were doing) and it is so much fun! It helps me realize why the children are enjoying playing in this area today! The grass and snow combination make for a perfect natural slide, and it is a good physical challenge to climb back up. (FN, Nov. 13)

By experiencing this myself I was able to connect to the children's experiences of the appeal and draw of the hill, which was a way to relate to and understand these research participants (Olive, 2020). Sliding down the hill was almost irresistible to most of the children on days when the hill had the perfect covering of snow. The bluff afforded many

types of risky play opportunities, such as play with heights, play with speed, and play where the children can get lost, resonating with Sandseter's (2007) work. Figure 31 demonstrates the steep incline of the hill on another day, providing a glimpse of the children's perspective as they made their way back up.

Figure 31

The children climb back up the hill after sliding down



Note: Still image from GoPro footage, Dec. 11.

Jackie commented on the affordances of the hill during the fall and winter, sharing that:

Sliding is such a big thing in winter. I love that aspect because there can be these friendships made, there can be a lot of resiliency with trying to get back up the hill ... I love that. And it keeps them warm, so yeah, I'm glad we have those hills! (EI, p. 8)

Circling back to the original description of affordances by Gibson (1979), it is interesting to note that the hill not only provided affordances to the children but to other animals as well. During one of my observation days without the children present, I spotted two American robins on the hill, a male and female pair (see Figure 32). I filmed them for three minutes as they went

about their own activities, which included eating snow, pecking at the ground, looking up and around, hopping along the hill, flying to a nearby tree branch to keep watch, defecating on a sewer covering, and possibly eating although this latter activity was difficult to establish from a distance.

Figure 32

An American robin pair finds affordances in the slope of the hill



Note: Photographs taken on Nov. 16.

When the female robin was on the sewer cover, I noticed she perched on one leg and then hopped through the snow on one leg. As James (2010) explains, when it comes to birds staying warm in the winter:

The feet are a problem ... because they are generally not feathered. To cope with this, birds have evolved ways of reducing the heat loss. Birds' feet don't need to be kept at the same temperature as the rest of the body. In some cases, they can be kept just above freezing. This is done by adjusting the blood flow so just enough warmth is given to the feet to stop them freezing. The small surface area of songbirds' feet also helps reduce heat loss. (para. 2)

Further, James (2010) states that birds who “spend long periods standing on snow or ice may stand on one leg to reduce the surface area in contact with the cold” (para. 4). The robins were but two of the animals who found affordances and met some of their needs on the very same slope the children slid down at other times. This environment thus provided meaningful action possibilities for both humans and nonhumans.

Sense of Place and Stewardship

Developing a strong sense of place and attachment to a natural area is typically part of the forest school ethos in Canada. Children thus may become more comfortable with the site over time and may engage in more meaningful ways. As Smith et al. (2018) found, forest school is often reported to increase children’s understanding of the outdoor environment, improve their relationship with the outdoors, deepen their pride in having knowledge of the local environment, and forge their attachment to the site. In the case of this study, the children seemed to be entangled with the park in similar ways. It was also clear that one of Jackie’s goals was for the children to develop an intimate bond with the site and a sense of responsibility for the park:

My dream is that they’ll love the forest school and the bluff and that if the bluff is ever in trouble, that as teenagers or adults, they’ll all come to its defense (*laughs*).

So I think it’s really important to ... have this sense of caring and belonging and like, stewardship over it. (EI, p.9)

She also noticed that children who had been attending forest school longer seemed to know the site better than newer children:

We play this noticing game where we hide things in the forest and the kids who’ve been at forest school for a long time are so quick to see the foreign objects in the forest. We’ve had some new kids just come in the last couple of weeks, and they

were usually a little slower. And we [Jackie and the school founder] wonder if the kids who've been here a long time, they know the place that much more when there's things out of place, they have an advantage that we don't even realize. So that made me [think] maybe they know these woods more than what I just see, and they have a really strong connection even at a level they don't understand. They notice a change in a tree. They're not necessarily verbalizing it, but they notice, yeah. So that made me happy to think that even after three or four months, they've already gotten to know this place so much more. (EI, p. 9)

The forest school program was clearly seen to support children's sensory and embodied connections to the natural world by providing time and access to natural materials and spaces, and by being outside in all weather. Jackie's observation points to a noticeable change over time in terms of knowing and understanding the park. Powell and Somerville (2018) posit that for young children, deep engagement that connects their own body, the living creatures around them and the matter around them, is a form of sustainability education. Further, looking beyond a human-centric perspective, place can also be about relational and embodied experiences moment by moment. Myrstad et al. (2020) write:

... taking place seriously involves thinking beyond the use of environments or materials to facilitate the acquisition of skills or knowledge. Instead, giving up the notion of mastery and human exceptionality, a starting point might be embracing the excessiveness of place and the way in which it shapes possibilities for bodies to experience and learn together, often in unpredictable ways. (p. 10)

Many of the activities and play scenarios presented in the program were unrelated to all-world relations at the park and, indeed, many of these activities could have been carried out in an

indoor location such as when there was a blue tarp laid out on the ground and objects for the children to walk through as a challenge. The children enjoyed these games, and important skills were being developed (hand-eye coordination, balance, turn-taking, etc.), but in these cases, the park was a backdrop rather than an active participant in the learning experience. This can be termed learning *in* nature rather than *with* nature.

Weather Bodies Weathering

In the last section of this chapter, I examine whether implicit learning about climate and climate change may have occurred at forest school through embodied connections with weather. Research attention has been turned towards child-weather relations and how to address climate change issues within early childhood education, with increasing interest in “finding new ways of working with young children that are responsible to the climate challenges of our time” (Rooney et al., 2021, p. 5). Researchers working within common worlds, posthumanist, feminist, and new materialist theoretical frameworks have proposed and discussed such concepts as “weather bodies” (Pollitt et al., 2021), “weathering-with pedagogies” (Rooney et al., 2021), and “weathering” (Neimanis & Walker, 2014). Through this lens, child-weather lived experiences and moments are relational, intra-active, and co-shaping. Pollitt et al. (2021) see bodies as “always in flux, always moving, and continually mingling with wider ecological systems through the exchanges of air, water and matter that keep the body alive” (p. 2). For example, they observe how every time a child breathes, they are breathing weather: “weather swirls in visible and invisible pathways and breathing becomes a collaboration of repeated and perpetual weathering” (p. 6).

Human activity and actions are changing the entire climate of the earth on a very rapid timescale, resulting in a catastrophic loss of biodiversity and severe weather

outcomes such as wildfires and drought. These issues can seem abstract and difficult to grasp for many, and perhaps not directly related to children's outdoor experiences in Canadian urban centres. Indeed:

When it comes to understanding climate, our experience with weather can actually get in the way. We deal with and react to the weather every day, but we don't have the same direct connection with the climate. Weather is vivid, immediate, and sometimes remarkably changeable. Climate is abstract, historical, and relatively stable. We have to look at average values over many decades to understand climate, which means it's less readily understood and harder to relate to than weather.

(Climate Atlas of Canada, 2019, para. 8)

In places like the Arctic, however, where winters are noticeably warmer and wetter each year, the connection to climate change is more tangible (Myrstad et al., 2020).

Further, educators may not realize the importance of climate change education in the early years or may not feel comfortable discussing such issues with children or struggle with how to do so in age-appropriate ways. Although a recent survey found that over one third of educators working in nature-based education programs in Canada reported discussing topics like climate change and environmental issues with the children in their programs (Boileau et al., 2021), over the course of my study I did not once hear these topics come up.

Research on child-weather relations, however, points to the implicit messaging that comes through nonetheless when teachers take children outside, discuss appropriate outdoor clothing with children, and facilitate activities based on the current weather. Even if the topic of weather is not taught directly, then, educators' conversations about weather provide children with insights into child-weather relations. As Rooney et al. (2021) suggest, "when, for example,

the weather on a particular day calls for clothing such as jackets or added protection such as sunscreen, children make connections between actions, bodies and weather” (p. 6). These conversations may be a way to connect young children to broad global issues such as climate change. As Pollitt et al. (2021) write:

In these times of extreme weather events, humans are changing weather systems and weather systems are changing humans. This has implications for environmental education in the early years. One of the ways in which environmental education in the early years can attend to these changes is by shifting the focus on teaching children about the weather and weather systems in abstract ways, toward engaging all kinds of bodies to collaborate, move, and imagine weather. (p. 12)

Although climate and weather are different, Neimanis and Walker (2014) suggest that the distinction may need to be minimized in some educational contexts. Climate can become palpable through our weathering bodies. Climate is not, they write, “some natural backdrop to our separate human dramas—but are rather of us, in us, through us” (p. 559). Engaging pedagogically with weather can be a way of attending to climate change (Rooney et al., 2021). The children in my study were connected to climate change also through the clothes that they were wearing, given that their boots, snowsuits, mittens, and hats were likely made abroad in garment factories as part of a linear system of goods production geared towards consumerism. As Neimanis and Walker (2014) explain:

...we also retain multiple pasts in the fabric of the clothing we wear to protect ourselves from the wind, whose production takes place thousands of miles away in hot, humid climates, and whose fossil fuel-powered transport in ocean freighters

and long-distance trucks is contracted by the climate that we in turn contract. (p. 570)

Thus, there were several important connections between the children, the other bodies at the park, the weather, and even climate change in this study. By attuning to immediate encounters between children's bodies and weather, the educators at the forest school were enacting a "weathering-with" pedagogy (Rooney et al., 2021). The children learned about weather through having "opportunities to be with weather in all its discomforts, unpredictability and complexity, where they might recognise their own part in the weathering of earth and futures" (Rooney et al., 2021, p. 11).

Conclusion

In this chapter, I have explored the intra-actions with weather, place, and landscape that shaped experiences at the park over the course of this multispecies ethnography. Of course, weather, place, and landscape determine the type of natural environment that manifests in a geographic location, albeit greatly determined by the impact of humans and human activity in the area. However, these elements are not simply a backdrop to the children's learning, but active forces, co-shaping moments together with living beings and materials. The children's movement and clothing determined their comfort level and, by extension their attitude and behaviour. As they slid down the hill, discussed weather and clouds, and played according to the affordances of the site, the children had embodied learning moments, which then in turn, impacted the landscape, trees, and weather. In Chapter 7, I shift to examining other material encounters that children had with snow, sticks, and tools as part of their forest school experiences. These items/beings are seen to also have had agency and to have contributed to shaping these relational encounters.

Chapter 7: Thinking with Materials

Inspired by Rautio (2013) and other new materialists, in this chapter I head in a somewhat different direction, exploring “mutuality in child-matter relations” (p. 402), noting the main “things” that presented themselves as important throughout the study and examining them through a relational, agential lens. As Rautio (2013) suggests, I do not seek to focus on the *purpose* of children’s interactions with snow, sticks, grass, and ropes. I could wonder what the children are learning, what areas of development were being promoted, whether the educator was achieving any educational goals through the use of these materials, or even, particularly germane to my study, whether the children were gaining a sense of empathy or stewardship for the natural world. However, that would entail a clearly humanist focus. Rather, in line with new materialism, relational materialism, and posthumanism, here I choose to wonder about the relations themselves, as they are, and to *think with* these materials (Ulmer, 2017; Pacini-Ketchabaw et al., 2017).

A shared agency is created when bodies and objects are joined together in action, however mundane, such as when a child picks up a stick for no apparent reason other than to carry it. What is it about sticks that can so capture the imagination of a child (or a dog) and lead them to be carried? Does the light and powdery texture of snow beckon to be touched and put into containers? These seemingly ordinary relations and regular occurrences at the forest school program give a sense of the assemblages in, and common world of, the park and shed light on my second research question regarding children’s embodied and affective connections to the natural world. Exploring children’s playful experiences with materials in such a way has been done by several researchers applying a new materialist/posthumanist lens, to which I connect in

this chapter (e.g., Myrstad et al., 2020; Pacini-Ketchabaw et al., 2017; Rautio & Jokinen, 2015; Rooney, 2019)

Snow

Snow was present on most of the days, although sometimes completely melted away and absent on some of the warmer days, which led to a variety of intra-actions with the children, me, and with the other objects and beings at the park. Snow is a force that can make children do things and can do things *along with* children and adults.

Bodily Engagement with a Snowy World

Because of its temperature, snow means there is usually a layer of clothing between a human and the snow; its presence typically means that humans, especially little ones, will be covered with snow pants, jackets, hats, mittens, and boots if staying outside for a long time. It was important for the children to be dressed appropriately for the cold and snow, as discussed in Chapter 6. The educators and I were no different. Being covered up with winter gear means that lying down or sitting on the ground is now not only feasible without getting inner clothes wet or dirty, but in fact is rather enjoyable given the cushioning of snow pants and the cushioning of the snow itself. Jackie noted in her interview that some children at forest school in fact engage much more in activities when they are covered up and the fear of getting hands or clothes dirty is non-existent. Having a layer of snow on the ground also meant that sitting and having a snack on the ground was easy and comfortable for the group. In my experience, especially since I was often sitting observing for much longer periods than the children, the snow got cold after a while even through my snow pants, so I was happy to have an inflatable seat cushion to sit on for observations.

Snow also hides the unevenness in the ground and creates an extra few inches to walk through in boots. Therefore, it creates more physical demands and the children sometimes seemed to struggle with balance and footing, especially on a slope or hill. Snow was also sometimes quite slippery, especially with smooth long grasses just beneath. Some children seemed particularly responsive to the slippery snow's invitation and seemed to seek out these challenging opportunities. Along the hill, snow on grass created wonderful natural slides that were often irresistible to the children, even if the educator had not meant for them to slide down at that time. Most of the time, the children slid down on their bottoms or while laying on their backs, but some children slid down on their stomachs. As noted in the previous chapter, I slid down a few times myself to follow the group and quickly realized how enjoyable it was! It is interesting how wearing protective clothing invites deeper full-body engagement with snowy environments. Having mittens on also seems to invite putting hands in the snow.

Along with Myrstad et al. (2020), I wonder, “what we can learn both about the moment-by-moment attunement between child, snow and place” (p. 1)? Their study was set at a kindergarten in Arctic Norway where children spend time outdoors year-round. They present examples of children's entanglements with snow, conceptualizing “children's movement through deep snow as a mutual process of correspondence” (p. 3). For example, when the kindergarten class goes on an ice fishing trip, the researchers are curious about what *else* is happening, examining children's walking through deep snow and the traces they left on an originally blank slate instead of focusing on the planned pedagogical activity. I am also curious about children's bodily engagement with snow. Did the children in my study also attune their body to the nuances that change the consistency of snow, such as light, wind, temperature, and weather (Myrstad et al., 2020)? Were they learning to live and physically engage in a snowy place?

Representing and Imagining with Snow

Snow is a wonderful loose part and lends itself well to engagement for children’s imaginary play. One day, for example, I observed:

The children started making snow cones and cupcakes by putting snow into the metal mini-muffin pan. One child offers me cupcakes and I take one – with my mitten I awkwardly fling the snow out of a muffin mount and bring my mitten up to my face to pretend to eat it. “Mmm!” (FN, Oct. 23)

The combination of snow and cookware seemed to beckon to the children, some more than others. Charles and Julie particularly enjoyed representing all sorts of baked goods with snow and offering them to others. A bowl full of snow became a bowl of soup or spaghetti, while a muffin tin filled with snow was interchangeably ice cream or cupcakes (see Figure 33). The sometimes powdery consistency of snow made it easy to imagine it as flour and sugar for baking. Charles made a “chocolate and strawberry and banana” cake by filling a loaf pan with snow and offered some to me and to Jackie.

Figure 33

Making cupcakes with snow



Note: Still image from GoPro footage, Oct 23.

Snow could even cover up a muffin tin entirely and in a sweep of a forearm reveal a completely full and perfectly flat set of 12 snow cupcakes. Snow is a playful trickster, often changing shape.

In their exploration of children and snow piles from a post-developmental perspective, Rautio and Jokinen (2015) suggest that engagements with snow can matter to children in the moment, and researchers do not necessarily need to look to the meaning of the experience.

Rautio and Jokinen look at snow piles as sites of ongoing mattering:

In viewing children's activities in their everyday life surroundings only in terms of what they might mean – either to the children themselves or in relation to their development – we risk losing the part of our ongoing existence that cannot be mediated, the on-goingness that matters nevertheless. We could think of the ongoing mattering of a snow pile through taking into consideration the entire event, the sociomaterial assemblage that the children take part in, or exist as parts of, virtually seizing to be individual children for the duration of the event. (p. 10)

When a child fills a container with snow to make cupcakes, snow matters in the moment, beyond what it might *mean* for the child to be representing with snow.

Snow as a Shapeshifter

Snow seemed to take on the essence of whatever container it was in during the children's play and exploration with snow. For example, snow in a plastic ice cube tray was referred to as ice cubes. Snow could also be built up like a castle one moment then flattened down then plowed through with a determined mitten to make a road (“It’s a cake road!”), showing how fluid its shape could be.

Snow could also be transformed from loose to firm when packed into a container and then unmoulded. In one case this meant that snow became a free-standing loaf of bread that

could be sliced with a plastic shovel. Sometimes the consistency of the snow was surprisingly clumpy. Clumps almost asked to be satisfyingly broken apart with various implements. Snow also can be a test of balance – how much can be piled onto a shovel before it topples over and you need to try again (see Figure 34)?

Figure 34

Snow is transported to a loaf pan



Note: Still image from GoPro footage, Nov 13.

Snow also called the children to pick it up and throw it, sometimes in the air to make wonderfully shiny confetti, sometimes to make snowballs to throw at each other. Rules had to be put into place by Jackie to ensure that the children were asking their friends before throwing snowballs at them so that no one would get upset. The snow sometimes also seemed to be more like chunks of ice, which seemed to make it even more enticing to pick up, just lying there on the side of the path, already formed and waiting.

Here we see that snow can be seen as an “inherently pedagogical agent” (Rowan, 2015, p. 205). The snow itself teaches children about moulding, transporting, and throwing snow. As Rowan (2015) writes, “this is different from the Western notion of a child learning *about* snow in

which the objective is for the child to master the snow” (p. 206, emphasis in original). In Rowan’s (2015) research, an Inuit elder shows young children how to carve snow. The children observe, then try it out. They think through snow in an “actual, embodied, and emplaced interactive event” (Rowan, 2015, pp. 205-206). Similarly, in my study the children learned with and from snow. They had long periods of time to get to know snow, and ponder if it suggested to be shaped like a castle or thrown like confetti. The obvious difference with Rowan’s study is that the children here did not have an Indigenous Elder from whom to learn about snow, although they did have opportunities to learn from an experienced adult; for example, when it came to tool use with sticks Jackie often demonstrated the techniques to the children.

Snow Aesthetics

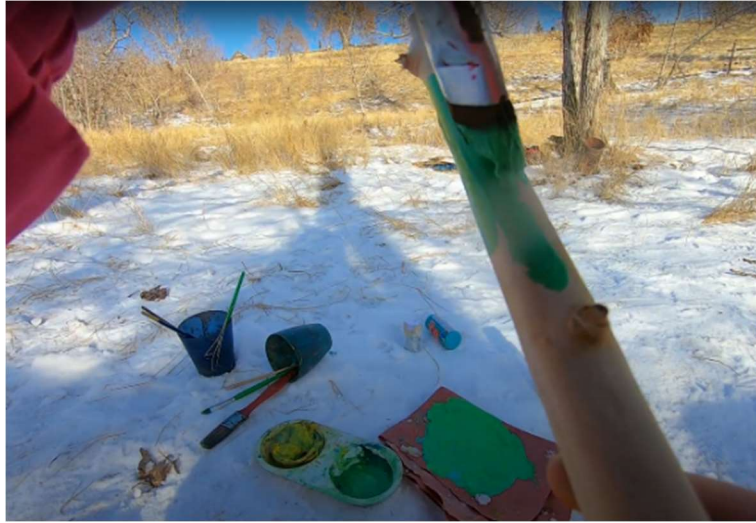
There is much beauty in snow. Snow can catch the sunlight and make areas glow and shine. I noted on one day that, “the ground is covered in snow but there is grass poking out; long shadows – it looks beautiful!” (FN, Nov. 20). Snow seemed to be completely in control of how the park looked, some days making everything crisp and white, sometimes matching the colour of a grey sky perfectly, sometimes contrasting with a bright blue sky and matching the white clouds.

Snow also carries the tracks of every being that has walked, run, landed, or fallen on it. It reveals secrets of movement and wanderings that are invisible on dry soil at other times of the year. Jackie noted that tracking during the winter was something the children enjoyed and with so many dogs around, they were almost guaranteed to find tracks. Snow also created a white background that seemed to make some items like dark sticks stand out because of colour contrast, perhaps drawing more attention to them than if they were lying on soil or mud. Snow can be deceiving though when it partially covers things up. Sticks sometimes looked available

and free but ended up being trapped in frozen ground at the other end. The GoPro lenses also got covered in snow and sometimes all I could see in the video footage was blurry snow. Snow also could offer an art studio space (see Figure 35).

Figure 35

Snow holds art supplies



Note: Still image from GoPro footage, Nov. 20.

In their book, *Encounters with Materials in Early Childhood Education*,” Pacini-Ketchabaw et al. (2017) discuss children’s entanglements with various materials through a diffractive mode of inquiry. Paper, charcoal, paint, clay, and blocks are all materials commonly encountered in early childhood education environments, especially in programs following the Reggio Emilia approach. In Pacini-Ketchabaw et al.’s (2017) work, they consider how these “materials ‘speak back’ to children in agentic ways” (p. 3). Paint was often presented to the children at forest school to complete various crafts or projects (in the case of Figure 35, the children could paint their pointy branch green to make a Christmas tree, for example). Given that the children’s creations all looked very different, the paint seemed to speak back to the children, engaging in co-creation. Paint, hands, brushes, snow, sticks, and other materials formed

assemblages that were, as in Pacini-Ketchabaw et al's (2017) work, "alive [and had] a life of their own that is more than the sum of their parts" (p. 53). These assemblages were about more than developing fine motor and artistic skills, they were about worlding (Pacini-Ketchabaw et al., 2017).

Sensory Experiments

I asked Jackie how the children used their senses during my time with the forest school and one of the most important aspects she identified was eating snow. She remarked that, "for the most part, we never encourage snow eating, but for the most part, if kids are eating snow and it's untouched snow, I don't really say a whole lot" (EI, p. 6). The topic of eating snow came up a few times as the children wondered if snow was "clean" or "dirty." One child confidently stated, "I'm not eating snow! There's dirt in snow!" while another can be seen in Figure 36 carefully licking snow from his shovel. Snow melted and disappeared on his tongue as he ate it for several minutes.

Figure 36

"This is clean snow, look!" – Joe



Note: Still image from GoPro footage, Nov. 13.

I did not eat any snow myself, although I'm sure I had my fair share as a child! On one day, the snow called to me in a different way. Imagining how it would hold my handprint and feeling overdressed and warm, I was drawn to the cold that snow offered. I pressed my hand into the snow next to where I sat (see Figure 37) and noted that, "The cold is a strong sensory feeling! The snow is easy to take shape – 'sticky'." (FN, Nov. 9).

Figure 37

I pressed my hand into the snow



Note: Photograph taken on Nov. 9.

Snow is not passive matter but rather a constantly shifting and changing entity that calls to intra-act with children and adult researchers. When children move their feet in the snow, snow also moves the feet. When snow crystals touch the tongue, the tongue touches the snow crystals. The children, through direct and sensual encounters such as these, have access to "another source of knowledge" (Bartnæs & Myrstad, 2022, p. 86). Here the children have access to knowledge about the temperature, taste, and texture of the snow. When pressing my hand in the snow, I accessed similar sensory knowledge, knowledge that could not be gained from reading or hearing a description. Bartnæs and Myrstad (2022) write:

Walking on, touching, and tasting snow are ways of showing awareness of the world – of being fully present in the moment. In their encounters with the various snow conditions, the children interact with the terrain, the path, the wind, gravity, the texture, and consistency of the snow and with other elements. They focus their awareness on what they discover in the encounters by tuning in and responding through their large or small movements. (p. 86)

Children in my study (as well as adults) similarly had these moments of awareness of the world through intra-action with snow.

Sticks

Sticks were a very prominent part of the forest school experience, part of many different types of intra-actions. The children were drawn to sticks; as Jackie described, “[They are] definitely a stick group. ... They love sticks a lot. That’s probably the biggest natural piece that they’re drawn to” (EI, p. 1). There may be a host of reasons why humans, notably younger ones, will pick sticks up and make use of them. As Selly (2013) writes:

Sticks, like many other loose parts from nature, are inherently unpredictable: they may be heavy, light, wet, or dry. The texture may be unusual or inconsistent. No two sticks are alike in size, shape, color, heft, or function. Sticks are tools with which children can manipulate their environment. Sticks make great building materials, props for dramatic play, tools, and even musical instruments. Children can poke and drag sticks, making interesting patterns in the snow, sand, or leaves. Sticks can sometimes give children opportunities to test their own physical abilities: just think of the sense of accomplishment brought by carrying something that is twice as long as your own body! (para. 7)

Loose parts, mentioned in Selly's quote, is a term used in early childhood education to denote a variety of objects and materials that can be moved around, and used by children in various ways. The loose parts theory was originally developed by Nicholson (1971) several decades ago and is grounded in the idea that "in any environment, both the degree of inventiveness and creativity, and the possibility of discovery, are directly proportional to the number and kind of variables in it" (p. 30). Sticks are an example of loose parts that can allow for complex play since children have infinite ways to arrange, move, create, and imagine with sticks. Books like *Stick and Stone* (Ferry & Lichtenheld, 2015) and *This is Not a Stick* (Portis, 2008) encourage young children to imagine the possibilities that sticks offer in terms of play. In my research journal, I noted that:

Sticks, branches and trees are definitely prominent in their [the children's] experience. The stick can be a magic staff, a gun, a ladder step, can be whittled and decorated into a lizard or snake, can be carried around, can tap to make sounds, can even be put in your mouth. Sticks are fought over. (RJ, Nov. 7)

Child-stick relations thus took many forms. I now examine some of these by focusing on children carrying sticks, sticks as playful partners, and the emotional aspects of engaging with sticks.

Carrying Sticks

George walks through the park, behind the group, on the way to the spot where they will start their day. The GoPro camera captures the crunch of snow as he walks. He passes by a branch on the ground, turns, and picks it up (see Figure 38). He carries it as he walks several feet, until he is confronted with a small tree and its overhanging branch, just at the height of George's head. He uses his free hand to

bend the tree branch, so far down toward the ground that it cracks and breaks off. Sean, who was just behind, utters an impressed, “Whoa!” George leaves the newly created stick on the ground and keeps walking with the original one in his hand. Suddenly, another stick, a thicker and longer one this time, catches his eye through the snow. He reaches down to pick it up and carries both sticks towards the group.

(GP, Oct. 23)

Figure 38

George stops to pick up an interesting stick



Note: Still images from GoPro footage, Oct. 23

Scenes of children noticing, picking up, and carrying sticks occurred on a regular basis at this forest school. I noted on one day: “The children like to carry sticks while they are walking up. Sean has a stick, Charles has a stick, and Julie has three sticks” (FN, Oct. 30). On yet another day, as I waited for the forest school session to start, a large stick along the path caught my eye. It had some shiny frost catching the sunlight and it drew me in. I photographed it and went back to waiting for the children to arrive. Interestingly, although none of the children had seen me, once they arrived and walked past it, George also noticed it and as shown in Figure 39, he picked it up and carried it – all the way up the hill to the spot.

Figure 39

A sparkling stick that drew me in, and George carrying the stick minutes later.



Note: Photographs taken on Nov. 6.

What explanation can there be for this intimate, physical, stick-child and stick-me connection? How do sticks draw children (as well as adults and dogs) into touching or carrying them, for no apparent purpose, and even wanting to put them in their backpacks and take them home? The first photograph in Figure 39 does not truly capture the sparkling ice crystals that, in the sun, were like jewels and captivated me that morning as I waited for the group. With my researcher hat on, I was open and observant that day, attuning to the park and its beings. The frost was eye-catching and I felt the desire to challenge myself to capture it in a photograph. My attraction to this particular stick was beauty, whereas for George it seemed to be a rather physical desire to carry the heavy stick.

Here, a connection to autotelic processes discussed by Rautio (2013) in the context of children carrying stones around may be relevant. Rautio (2013) explains:

By autotelic practices, I understand activities that we repeatedly engage with for no external reward or motivation such as money or outside recognition. Autotelic

practices are internally motivating in that the activity is the goal and the reward in itself. (p. 394)

Rautio suggests that the materials themselves – sticks in this case – play a role in this process. Sticks beckon to people and people pick them up, and that is a meaningful intra-action in itself. This perspective differs from a humanist, developmentalist perspective where one might wonder what cognitive or physical developmental benefits the children may experience by interacting with sticks or whether playing with sticks was a safe activity for the children. Rather, this “momentary event produced by a mesh of related bodies (human and non-human)” (Rautio, 2013, p. 396) is the interesting event. Thus, autotelic practices seem to be at play when children pick up and carry sticks around simply for the enjoyment of the activity itself.

Playful Partners

Oliver and Joe were playing at the den area. Oliver is walking around nearby, and suddenly reaches down to the ground near a metal pipe to pick up a stick. He holds it for a moment, then as if noticing the similar diameter of the stick and a hole in the pipe, he silently flips the stick over and inserts it into the first hole, removing some bark to help it slide through. The stick comes out the hole on the other side (see Figure 40). Oliver walks back a few feet towards his friends and states, “We have a pointer finger that... OK, this thing he... OK this thing says, this thing just points them away.” Joe looks up, interested, and comes to see. He examines it for a moment then pretends to run away screaming and laughing, playing along. Oliver laughs then adds, “This thing points other people away.” He goes on to explain that the stick is now a special kind of scope that will help them see the rest of the group from their den. (GP, Nov. 6)

Figure 40

A stick goes through a pipe in the park



Note: Still image from GoPro footage, Nov. 6.

Sticks were often play partners throughout the study, sometimes representing other objects like guns, fishing rods, and a great many other things. One day, Julie found a fairly long stick and decided that it was going to be her magic staff: “Well, this is my magic staff! So I can turn them [the bad guys] into sheeps! Baaaaa!” Later, Julie decided to turn the incoming “army” into horses, and then frogs, pointing her magic staff and making a laser sound. Other times, sticks seemed a natural extension of the child’s body, as depicted in Figure 41, where a child uses a stick to make marks in the snow.

Figure 41

A child and a stick together create traces in the snow



Note: Still image from GoPro footage, Dec. 18.

What would the forest school experience have been without freely available sticks with which the children could play? A stick, with its particular length, weight, shape, colour, or other characteristics, stimulated children's imagination, thus playing an agential role in the playful intra-action. In a Western perspective, sticks are typically seen only as objects, but Ingold (2022) suggests that they can also be seen as alive:

Life, in Ojibwa⁵ ontology, is not an interior property that some kinds of things possess and other kinds don't. It is rather a power, diffused throughout the cosmos, that can take hold of things and beings in such a way that in their actions, in their movements, even in their sounds (which may be interpreted as speech), they

⁵ I want to note here that my study did not take place on Ojibway land nor is it connected to the Ojibway people. I also do not claim that this Ojibway perspective represents a perspective shared by all Indigenous Peoples. However, I do believe presenting this worldview can be useful for destabilizing the Western perspective that some readers may have.

become vividly present to us, in experience. In such moments, things, including stones, come to life. (p. xi)

Thus, sticks can be seen as playful partners that carry life, or a life force. The children were certainly drawn to play with, think with, and connect with sticks.

Navigating Emotions

During one forest school session, Oliver was visibly upset about not having a stick that was just the perfect length. Several people, including me, tried to help by offering different options to him, which he carefully considered as he was recovering from having big emotions that had brought him to tears moments earlier. Young children often experience strong emotions, both positive and negative, throughout their day and in this case, sticks were involved in this emotional event. A diffractive lens helps me open up this example: how does the child-stick relation connect with the child's big emotions? How can a stick be comforting to a child who is sad or frustrated? As discussed earlier, is there an autotelic force at work here, drawing in the child? And if so, how might this foster empathy for plants or other all-world relations?

Green (2016a), in her work on environmental identity development, brings our attention to the fact that children's emotions, including a range of negative emotions, can be affected by their environment:

Negotiating emotions, both positive and negative, is important in strengthening one's environmental identity. Just as children learn to regulate their emotions in formal learning environments, children's ability to regulate their emotions in nature instills a sense of comfort and trust, spatial autonomy and self-awareness, and environmental competency and self-confidence, which, in turn, influences their actions and behaviours towards the environment. (p. 131)

Green (2016a) also suggests that educators play a key role in helping children regulate their emotional experiences in nature. Indeed, at times, Jackie had to step in to assist the children when they were arguing over a stick.

On one occasion, a child dropped a stick then ran off, and immediately two other children reached down to pick it up. This was followed by an argument over whose stick it was, which was heightened further when the child who had left it came back to claim it (see Figure 42). As Jackie tried to navigate the arguments of a group of preschoolers over a stick, she calmly encouraged respectful conflict resolution where everyone was heard, which was difficult since she had not seen what unfolded prior. Young children seem to be very aware of the concept of ownership (Nancekivell & Friedman, 2017). In Nancekivell and Friedman's research (2017), children aged three to five – the same ages as the children in my study – were shown to increasingly use ownership to explain why it is deemed acceptable to use certain objects. They would understand that if the stick belongs to someone else, it is not acceptable to take it, for example.

Figure 42

Children argue over a good stick



Note: Still image from GoPro footage, Oct 23.

In my observations, children had strong notions of possessing, at least temporarily, the stick they had claimed, whether it was for play, for a craft, or another purpose. Such arguments and conflict did not seem to occur regularly during my study, possibly because the park yielded an abundance of sticks – enough for each child. The children were, however, very attached to the sticks they claimed and would get upset if another child took it or claimed it for themselves. Sticks were children’s companions throughout their emotional moments, whether happy, sad, and everything in between. Perhaps, in a sense, the life flowing through them, and the agency they had in these moments meant that sticks were not simply objects disconnected from the child. Stick-child relations were made and remade in an entangled and ever flowing dance. Sticks invited children in and out of connection, just as children invited sticks in and out of play and movement.

Sticky Reflections

Although the expression “loose parts” is commonly used in early childhood education literature to describe children’s use of sticks and other natural materials like stones and pinecones, this may stem from a Western and developmental perspective since the concept objectifies all materials with which children intra-act, even living creatures (Gull et al., 2019). What happens when child-stick relations are seen from other perspectives? For example, they can be seen as *gifts* provided by nature (Kimmerer, 2013). I write this section today from an island cottage nestled among “tree people” (Kimmerer, 2013) that, year after year, leave gifts of sticks all over the ground, ready to be collected for kindling to fuel a fire on a cool summer evening. If a park was barren of sticks, there would be no possibilities for children to pick up and play with sticks, but when a park is filled with sticks as the one in my study site was, are the stick providers ever acknowledged? Kimmerer’s sense of gratitude for what the natural world

provides shines throughout her book. I thus want to send my own gratitude to the trees of the park who, upon not needing certain branches anymore, generously let them fall to the ground where they are noticed and enjoyed by many beings, including humans and other animals.

Further, instead of seeing sticks as being ready for “use” by children and as an inanimate material, Rooney (2019) explores the “sticky” attachments between children and sticks, deeming them a sort of affective glue that draws children in. In her chapter, “Sticking: Children and the Lively Matter of Sticks” based on her work with children in Australia, she writes:

In observing children’s relations with sticky matter, we witness a lively, ongoing interchange that forges relations in and with the environment. In these simple everyday moments, it seems that something important is going on in the way children risk attachment to and stick with their sticky companions. By reaching out to sticks, the children seem to bring to the surface our entanglements with/in long histories of contact that stick with us over time and place. (p. 51)

This quote, grounded in a common worlds perspective, resonates well with the child-stick relations in my study. I am left wondering if, when the children brought a stick from the park back home with them, did this sticky connection created at forest school carry on at home and over time?

Conclusion

This chapter has honed in on children’s relations with materials, specifically snow and sticks, inspired by new materialist and posthumanist theories. I wondered about the relations themselves as opposed to what children were learning, *thinking with* these materials (Pacini-Ketchabaw et al., 2017, Rautio, 2013; Ulmer, 2017).

In wondering about child-snow relations, I connected to the work of others who have examined child-snow relations through perspectives that challenge the humanist and developmental approach (Bartnæs & Myrstad, 2022; Myrstad et al., 2020; Rautio & Jokinen, 2015; Rowan, 2015). I thought about the ways snow invited children's intra-actions and the generative knowledge that was created in thinking with snow through experience and sensual encounters. I reflected on a second material, sticks, that was important to the experience of children in the park and their multispecies kin. Children carried sticks, imagined with them, and even became at times emotional about their relations with sticks. Although sticks would be termed "loose parts" by many early childhood education professionals, this term does not seem to capture the complex, "sticky" attachments between children and sticks (Rooney, 2019), nor the agency that sticks might have.

Connecting back to the previous chapter, when materials and beings are outdoors such as what occurred in this study, they also are affected by "weather, temperature, light, humidity, wind, and airborne particles" (Bartnæs & Myrstad, 2022, p. 80). Therefore, all these materials were constantly in flux and in movement (Bartnæs & Myrstad, 2022). As their properties shifted and changed, the materials became entangled with the children, other beings, the educator, the researcher, and the GoPro cameras.

This chapter is the last of the "findings" chapters. I now return to my initial research questions, illustrating how the insights I gained through the previous four chapters helped me answer them, even if only partially. I also reflect on other research questions that emerged for me throughout the study as well as methodological insights on the *doing* of my research.

Chapter 8: Returning to the Questions and Pointing to the Future

In this final chapter, I look back at the methodological process and findings of my multispecies ethnography, drawing out the main insights and discussing how these contribute to existing literature. I suggest how these findings could potentially inform forest school pedagogy and practice, reflect on methodological insights gleaned from my experience, and suggest directions for future research that could build on my study. I also discuss some of limitations of my study. I begin this chapter by outlining each of my research questions and responding to each one.

Answering my Research Questions

Although my study was guided primarily by two main questions, four secondary questions emerged once data collection was complete, some methodological in nature. The first two questions listed are my original questions, and the secondary questions follow. My "answers" are not always straightforward, which aligns with my theoretical inspirations; I suspected as I embarked on the data analysis journey that a "messy" process would ensue, with assemblages of ideas, stories, and theories that would blend together to form sections and chapters gathered around particular themes. In cases where my questions were especially difficult to answer, I explain why that might be the case and suggest partial responses.

How, if at all, Do Children Empathize with the More-Than-Human World in a Forest School Setting?

This turned out to be, indeed, one of the more difficult questions to answer, partly because the program I was observing was not focused on close contact with other animals, which I wager are easier to empathize with than plants or fungi, and partly because the season limited the presence and activity level of other beings at the park. In contrast to, say, a classroom where

children care for a rabbit or other companion animal kept captive and where the teacher may specifically discuss the life of the animal, their needs, and how to care for their companion, my study's context meant that I had to be attuned to possibilities of interspecies empathy that might happen with wildlife or other life at the park in brief and unplanned moments. Using GoPro cameras worn by the children greatly helped me from a methodological point of view, since I could revisit the moments captured many times during analysis.

In my literature review in Chapter 2, I discussed various aspects of empathy, citing Batson's (2009) list of common definitions of empathy. To help me further unpack what emerged in my study, I now re-examine Batson's list of definitions since they cover numerous types of emotional and cognitive empathy. In Table 4, I list them alongside my observations of how they were embodied, or not, in my study.

Table 4

Batson's Definitions of Empathy and Corresponding Study Observations

Common Definition of Empathy (Batson, 2009)	Connections to My Study
"Knowing another person's internal state, including his or her thoughts and feelings" (p. 4)	This type of empathy was potentially enhanced through educational activities like reading books that presented natural history information, though the definition of a "person" would need to be inclusive of nonhumans.
"Adopting the posture or matching the neural responses of an observed other" (p. 4)	While the children did this with one another or with the teacher, there were limited opportunities for this with other animals.
"Coming to feel as another person feels" (p. 5)	I found this difficult to observe.
"Intuiting or projecting oneself into another's situation" (p. 6)	I observed several occasions of this during imaginary play and games, such as pretending to be a mouse in the woods.
"Imagining how another is thinking and feeling" (p. 7)	An example of this was Oliver's suggestion that the dog might prefer liver-flavoured cupcakes.

“Imagining how one would think and feel in the other’s place” (p. 7)	There were limited opportunities to observe this beyond the human. Charles asking if rocks hurt trees could be an example.
“Feeling distress at witnessing another person’s suffering” (p. 7)	On some occasions, the children seemed to get distressed if another child was crying or upset, but no suffering plants or animals were seen by the children during my study.
“Feeling for another person who is suffering” (p. 8)	There were limited opportunities for this since the children were not exposed to humans or animals who were suffering.

As Table 4 illustrates, I found that children demonstrated empathy more commonly with each other although, on occasion, there were glimpses of it with all-world relations in their play, activities, discussions, and through direct encounters in the forest school program. In contrast to Batson’s (2009) humanist work, when I revisited Gruen’s (2015, 2017) work on entangled empathy, I found much more applicability to my study. Gruen’s concept is a blend of cognitive and emotional empathy with a greater emphasis on caring; it is a process that recognizes human relationships to others, including animal others, and also entails responsibilities to ourselves and others. Gruen acknowledges the complexity of our entanglements with others (including other animals), and she also envisions entanglements that go beyond our geographic location. As an example, the children in my study were entangled with the people who created and packaged the food in their snacks at forest school and the various beings, plant or animal, who went into those snacks.

Gruen (2017) suggests that though it may be easier to empathise with:

...someone whom we have developed intimacy with over a period of time ...we are not unable to imagine the perspectives of different others, although it isn’t easy or simple, just because they are not close to us spatially, emotionally, and/or physically. (p. 453)

The children could empathize with coyotes who they did not see or trees with whom they may have little in common with physically, illuminating how Batson's (2009) humanist definitions fall short, at least in this context. Further, Gruen posits that one's understanding of any other being is often incomplete and "in need of significant revisions; however, the goal is to try to take in as much about another's situation and perspective as possible" (p. 454). Oliver's notion that a dog might like a liver-flavoured cupcake was clearly incomplete, for example, and will likely be revised over time as he learns what types of food dogs eat. Learning about the lives of others in forest school through direct experiences, natural history activities, and discussions could help make it even easier for him and the other children to relate to a future dog at a later time, and the same goes for other beings sharing this common world in the park.

As Gruen (2015) suggests, children can also empathise with fictional characters from a story, thus books like *Scaredy Squirrel* that were used in this forest school program could potentially help children attune to what others feel and experience. What my study suggests is that there is potential to further examine and deepen the concept of an interspecies entangled empathy within the realm of childhood, informed by relational and common worlds perspectives.

How Might the Forest School Setting and Pedagogy Facilitate Children's Affective and Embodied Connections with the Natural World?

Beyond the concept of empathy, it has been argued that hands-on, sensory, and embodied experiences outdoors are important for children's learning about the world and for their development (Chawla, 2015), including of their environmental identity (Green, 2018; Pelo, 2013; Williams & Chawla, 2016). Forest school pedagogy is centred around engagement with a natural space. Indeed, the very first principle of forest/nature school, according to the Child and Nature Alliance of Canada [CNAC], is that it "takes place in any outdoor space, including urban

greenspace, playgrounds, forests, creeks, prairies, mountains, shoreline, and tundra” (2020, Principle 1). As such, participants of forest school programs inherently have opportunities to play with and learn with natural materials, other living beings, and weather forces. In comparison, nature-based preschool programs that dominate the US landscape are often still associated with an indoor space where the children spend some of the program time (Larimore, 2016). Artefacts like bones, branches, or stones may be brought indoors for examination and sensory play, but the children experience these materials in a more controlled environment. While my study did not focus on child development nor did it offer a comparison of the forest school experience and other early childhood education settings, my findings nonetheless did reveal a number of instances when the children had opportunities to engage with materials, beings, and weather in ways they simply would not have been able to do had they been inside.

Forest school pedagogy is also said to facilitate children’s deep connections with the natural environment through a “a sustained process of regular and repeated sessions in the same outdoor space” (CNAC, 2020, Principle 2). In doing so, it is argued that this supports children in developing a “reciprocal relationship with the Land, and an understanding of themselves as a part of the natural world” (CNAC, 2020, Principle 2). A one-time program or a program that moves to new environments each time cannot offer children the same opportunity to become increasingly comfortable and more understanding of a particular space over time. Rifkin (2009) suggests that it is possible to empathize with entire ecosystems; perhaps a place-based approach like forest school can help develop this rather advanced form of empathy?

The nature of the experience at forest school is not solely guided by the forest school principles, of course, but also on the educator’s personal interests and approach to teaching. For example, some educators may emphasize contemplative activities and natural history

observations and research while others may not. Some educators may be more inclined to follow the children's interests, even if they are not connected to the forest school site, while others might take more control and lead activities that they feel will increase knowledge of the living beings around them. In this study, the educator's interest and comfort with dogs led to her encouraging contact with dogs and one can imagine other educators being less inclined that way.

In this study, the children's affective and embodied experiences with the natural world were facilitated through them attending the forest school program weekly, through different weather, without manufactured toys and very few manufactured materials. When the weather was warmer, sensual experiences were less mediated by clothing since the children could take their mittens and jackets off, allowing them to feel the sun and wind on their bodies and to use their sense of touch. When the weather was colder, temperature regulation indirectly connected them to the natural world, and even to climate, as they learned how to remain comfortable. Like Mycock's (2019) findings from research conducted in the UK at two forest schools, "instead of simply learning about the nature of life in the forest as separate from themselves, they had embodied and affective experiences of their own entanglements in forest 'naturescultures' and engaged in the process of collective world making" (p. 12).

Which Non-Human Species or Individuals Presented Themselves as Research Participants and Partners in the Research Process?

This secondary research question is largely answered in Chapters 4 and 5. The primary other species who (unknowingly) became part of my study directly were domestic dogs, black-billed magpies, chickadees, Canada geese, eastern grey squirrels, American robins, balsam poplars, crested wheatgrass, and rough fescue. Only dogs were recognizable at the individual

level rather than at the species level, thus for most of these research partners, their voices were heard not as particular subjects of a life, but as members of their species group.

In Haro Woods et al. (2018), a forest was named as the first author of a publication by a group of common worlds researchers writing about pedagogies of care and young children's forest relations. The authors write:

In writing this manuscript, we feel compelled to acknowledge Haro Woods as coauthor in its creation. This is problematic for a number of reasons. And it is here we begin to stumble. Because we cannot set ourselves outside of a long line of settlers who have laid claim to these territories in various ways, we list Haro Woods as a coauthor in this paper with the understanding that this is not a neutral act.

However, we also feel this is an important step in decentering ourselves and interrupting the belief that we (humans) are sole creators of the forest pedagogies we work with. (p. 50)

This bold move is an example of some of the boundary-pushing research and writing practices taking place in the realm of common worlds and posthumanist research.

In my own study, I gratefully acknowledged the presence of all world beings at the park and included them through sharing natural history to help readers shift their focus away from the children at times. For example, in Chapter 4, I shifted my attention to bird lives by describing their species before discussing my observations at the park and child-bird relations. In this way, I hoped that the reader might feel that humans and birds are on the same level of importance. Similarly, I started my chapter on intra-actions with trees and grass by giving voice to plant beings, through natural-cultural history, as opposed to starting with a focus on the children and their learning. I also wrote a vignette that centered

the balsam trees' experience to end Chapter 5. The beings and materials that featured in my study were an integral part of the research through their intra-actions with children and with myself, although admittedly it was challenging to de-centre the human throughout my study, as was also experienced by Pacini-Ketchabaw et al. (2016). At times, I found myself veering off-course and needing to self-correct; acknowledging this honestly illustrates the challenges of conducting posthumanist educational research.

Additionally, other presences who were remembered, imagined, or felt included bison, fescue grasslands that were no longer intact, and Indigenous Peoples. I attempted to include some of these through attending to historical accounts, and I would have included more of these connections had discussions about them occurred during the forest school program, or had Indigenous knowledge or artefacts been included in children's activities. I recognize that my period of observation was relatively short and these might have come up at other times in the year but the data I did have did not lead me there. Still, the park itself is fraught with tensions, simply by being situated on the traditional territories of the Blackfoot Confederacy (Siksika, Kainai, Piikani), the Tsuut'ina, the Îyâxe Nakoda Nations, and the Métis Nation (Region 3), all of whom were signatories of Treaty 7. Nxumalo (2019) notes that "settler colonialism is deeply entangled within taken-for-granted banalities of everyday early childhood nature pedagogies in BC" (p. 55) and this is no different in Alberta. The displacement of the Indigenous Peoples mentioned above, and the changes to the ecosystem that was flourishing here pre-contact, continue to shape everyday relations; the erasure of and disconnect with local Indigenous knowledge is something to reflect upon. I could also ask which non-human species or individuals did *not* present themselves as research participants or partners, and why?

In What Ways Did Materials, Landscapes, and Weather Invite Children's Interactions/Intra-Actions?

Chapters 6 and 7 point to the important role of non-living entities and forces in this study. Materials such as sticks and snow invited many types of intra-actions, often simply by being present. A large stick along the path, where there was no stick the previous week invites curiosity: How did this stick get here? How heavy is this stick? How does it feel when it is carried? A fresh snowfall invites curiosity and sensory connection: What kind of snow is this and how does it compare with previous knowledge and experiences with snow? What can be done with this snow? What does this snow taste like? The landscape of the park also intra-acted with the children. As the landscape offered a place to slide, the children's bodies in turn changed the landscape somewhat by compressing the snow and the soil below with the weight of their bodies sliding down over and over, digging into the land, not unlike the lines in the snow created by children noticed by Myrstad et al. (2020).

Materials, landscape features, and weather conditions naturally provoked the children's interest, curiosity, and led to responses and actions such as observing, climbing, rolling, sliding, and touching. These provocations were naturally occurring and demonstrate why forest and nature school programs require few manufactured materials to entice the children to play. As suggested by Beery and Jørgensen (2018), sensory experiences and noticing differences in the environment are important ways for children to engage in a natural space. Both weather and landscape were much more than a backdrop to children's play (Blaise et al. 2019; Jørgensen, 2017). They prompted different games and activities, different types of movement, and different temperature sensations.

Materials, either naturally found at the park, or brought by the educators, called to the children, opening up possibilities for relational learning (Pacini-Ketchabaw et al., 2017).

Children used their imaginations for play with these materials, or simply carried them for no particular purpose (Rautio, 2013). These complex entanglements, vast array of possibilities, and naturally changing conditions, within a familiar place, created a shared common world full of vitality.

How Did Nonparticipant Observation and Sit Spot Observations Contribute to my Goal of Decentering the Children from the Research Process and What Can be Gleaned from this Experience as a Researcher?

As noted in Chapter 3, I had originally planned on conducting participant observations, but due to evolving health and safety limitations during the COVID-19 pandemic, I had to maintain a certain distance from the group. Unexpectedly, I found this forced transition useful for decentering my focus on the children. I want to emphasize this point as I am unaware of any published literature suggesting such distancing as a posthumanist or common worlds research method. Indeed, there is little practical guidance in the literature that would help a researcher or student plan a multispecies study of this nature, perhaps because thus far many researchers have applied posthumanist theory to data they had already collected (e.g., Harwood et al., 2019; Pacini-Ketchabaw et al., 2016) or do not describe their methodological process (e.g., Hodgins, 2019). The situated, contextual nature of common worlds research and the theoretical focus of posthumanism necessitates any researcher to develop their own unique process, but nevertheless I believe more guidance for researchers new to this approach could be useful.

With regard to using sit spots as a way to conduct field observations this idea emerged for me early on, as I read Young and Gardoqui (2013). Reading about bird language and sit spots in

the book motivated me to spend time better understanding the birds and other animals at the park when the group of children were not there. I noted in my research journal that doing so helped me shift my focus to the more-than-human world. For example, I often left a day of forest school observations thinking about what the children said or did, and wondering how that related to empathy, sustainability, and connections with the more-than-human world. When I went back to the park the next day or a few days later and sat down to observe and listen, my attention turned to listening to birds, watching people run or walk by, sometimes with dogs, and I often focused on experiencing with all my senses. I reflected and remained open and attuned to my surroundings. The children were not there, thus they did not draw me in with their laughter, conversation, and behaviours. I would highly recommend other researchers who are attempting to decenter their focus from human participants to try immersing themselves in the research context *without* the human participants present as I found this was very helpful for me.

I also found iNaturalist to be a great tool to help me identify and inventory species at the park. As well, experiencing and living with the same weather and forces as the research participants, especially in the context of an outdoor study such as mine, was very helpful. As Bartnæs and Myrstad (2022) note:

We have waded in the same snow, felt the cold on our bodies and the warmth from the bonfire and were exposed to wind and weather in the same way as the children.

This presence was the basis on which we shared experiences and engagement with the children (p. 82)

In particular, during the last few weeks when I was no longer allowed to observe the group directly because of the pandemic, spending time in a different location in the park on the same

day connected me viscerally to our common world even though they were out of sight and earshot.

Additionally, I want to highlight how, as my multispecies ethnography went on, I was somewhat surprised to find that my own empathy for the research site increased. I intentionally spent time learning about birds, identifying grasses and trees, reading about the medicinal properties of plants, and sitting and observing my surroundings peacefully. These actions meant that every time I returned to the park, I felt I had new knowledge and a new appreciation for what I was seeing. For example, reading about bird behaviour between visits motivated me to go back and check for examples of what I was reading in *What the Robin Knows* (Young & Gardoqui, 2013) and other sources (e.g., Foster et al., 2000; Peattie & Landacre, 2013; Savage, 2018). My experience in the park on my own starkly contrasted to my experience there when the forest school class was present, and I sometimes found myself wishing the educator and children realized how much more there was to know about the species in the park. I was bursting to share both my older and newfound knowledge and interests with them, but I was limited in my ability to do so given I had to keep a distance whenever possible because of the pandemic. As noted earlier, a guiding adult can play a very important role when it comes to developing and experiencing empathy for the natural world and other species. Certainly, Jackie, being a dog lover, likely increased many children's empathy for dogs and her directions to children to take care not to damage trees likely enhanced their concern for trees.

How Did the Use of Wearable Cameras as a Data Collection Method Align with Goals to Respectfully Bring in the Children’s Perspective and to Gain Insight into Child-Nature Relations?

As noted in Chapter 3, my original choice to use GoPro cameras echoed what other researchers have done to capture the perspectives of young children in their research (e.g., Caton & Hackett, 2019; Clement, 2019; Green, 2016b; Harwood & Collier, 2019). My experience with using GoPros certainly confirms the benefits that these researchers have touted, such as: the researcher can see what the child sees, the camera is unobtrusive, it captures interactions that traditional methods cannot, and puts size into perspective (Green (2016b), and the children find the cameras comfortable to wear (Burbank, 2018; Lloyd et al., 2018), even sometimes forgetting they are wearing it (Hov & Neegaard, 2020). Further, since the GoPro is worn by the children, the choice of what to film is completely entrusted to the child, “therefore reducing the unequal power relations that are so often present in traditional video research” (Burbank, 2018, p. 323).

In my study, the children could decide when they wanted to wear the chest-mounted camera, which became something they ended up committing to do for the duration of a class rather than switching between children partway through because I had to avoid close contact with the children and had to sanitize the cameras between uses due to required pandemic protocols, a task I did not want to foist on the director or educator. Due to the limited battery life of the camera, the Digipower Re-Fuel Action Pack 9 hour extended battery was very useful given the length of time the children would wear the camera. This did make the cameras considerably bulkier and heavier, so for the last days of observations, I decided to go back to the original camera without the battery pack (even though they would not have enough power to film the entire forest school session) to make it more comfortable for the children. I also had to rely

on the educator to strap the cameras on the children herself since I could no longer attend the sessions myself due to a change in research protocol, and I wanted to keep the equipment as simple as possible so as not to burden her.

Jackie observed that the cameras were not obtrusive to play even when the children were sliding down the hill. She commented, “They’re a great design for having the kids be comfortable. Probably with more winter gear, the more comfortable they are” (EI, p. 12). Towards the end, the children were also very familiar with the camera and how to use it themselves. Jackie reported asking Charles if he wanted his camera on and he replied, “Mmm, nah” but later turned it on himself, which showed him taking control and that his desired level of participation was up to him and that was respected. Julie also often turned the camera off and on intentionally. These two children seemed to be the most interested in wearing the cameras overall, so it is perhaps not unexpected that they became the most adept with them and took the most control over how they used the cameras.

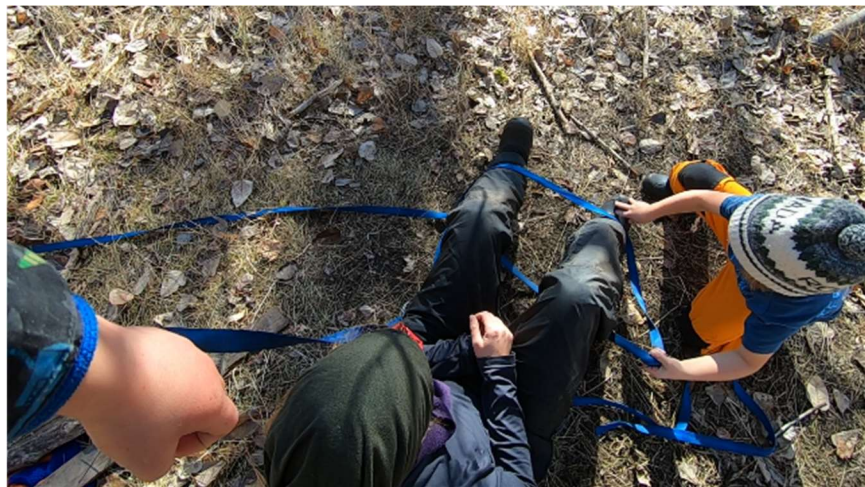
The GoPros also ended up being part of this group of children’s forest school experience during my study. As Harwood et al. (2019) write, the “GoPro camera ... is agentic and more than the passive backdrop to the children's stories” (p. 57). Similarly, in research by Pacini-Ketchabaw et al. (2017), photography was seen as a “process of collaborating and moving *with* the world” (p. 13, emphasis in original). Indeed, although the cameras were largely unobtrusive after the children put them on, on some occasions the cameras were intentionally included as part of play, which I had not foreseen would be the case. For example, on the very first day of recordings, Julie was wearing the camera and narrated to her “viewers” what was happening while the group was playing coyote-mouse on the paved path: “OK guys, this is in the coyote-mouse. (*She runs.*) We have to run!” (GP, Oct. 23) before moving to a hiding spot in the trees.

On another occasion, Jackie needed to collect the ropes that children were using at the den as it was the end of the program:

Joe pleaded for more time, so Jackie gave him a few more seconds, sitting down and letting Joe wrap her up with ropes. Sean, who was wearing the GoPro, was above this scene in the den, dangling and looking down (see Figure 43). He narrated, “So, we are trapping the teacher.” Then he climbed down, and as if to be acknowledged, he tells the duo, “You know, my video camera is on.”

Figure 43

Sean films Joe trapping Jackie in ropes



Note: Still image from GoPro footage, Oct. 30.

In this scene, the GoPro was Sean’s link to the play that was occurring, and his way of being involved. In a third example that took place during free play time at the den, Julie included the GoPro in play, telling the other children that she could take pictures of the “bad guys” with her camera. Thus, the GoPros were not disconnected from the children’s experience, but an active part of the research assemblage.

Watching the video footage was very insightful. As other researchers have noted, video data can take on a life of its own and evoke the emotions in the field (Caton & Hackett, 2019). It also was often destabilizing when the children were running and moving around. In these moments, I as the viewer could not see the child filming but was watching the world twirl and fly by, sometimes hearing the child out of breath when they stopped, or playfully engage with another child, sometimes getting an unusual closeup of a hand, tree bark or the inside of a lunch box during snack time. As Caton and Hackett (2019) note, this perspective “dislodges the spectator from their adult-centric viewpoint of the world” (p. 369). I found myself drawn into the children’s stories, for example when there was a misunderstanding or upset about a play scenario. I found myself feeling sad when a child seemed to be excluded from play. I watched and re-watched, sometimes intentionally paying attention to other beings and materials such as grass, snow, birds, and dogs to shift my perspective – a technique I would recommend to other researchers conducting common worlds research using GoPro cameras.

Study Limitations

Having summarized the answers to my research questions, I now wish to point to several limitations to this study. First, this study is not generalizable as it is contextual and situated in a specific time and place. However, just as the work of other common worlds and posthumanist researchers have informed my own research, my findings and reflections have the potential to contribute to knowledge and research practices in various fields of study. I am also aware that I will have been biased throughout the research process due to my position as a forest school practitioner myself, and an advocate of this education approach. I strived, however, to remain open and to document all aspects relevant to my research questions, and to be critical of a possible inclination towards moments that appear to fit with the romanticized view of children

playing in nature and empathizing with living beings. In line with interpretivist, qualitative research, I also embraced my own strengths and existing personal experiences (for example previous work at the forest school program and time spent at the park where research was conducted) as they could inform analysis. The practice of keeping a research journal provided an opportunity to engage in reflective practice and write notes throughout the data collection and analysis phase pertaining to my personal position and views, and how they might have been affecting my study.

My methodology itself also has several limitations, notably the difficulties of capturing children's and nonhuman others' perspectives. Indeed, Lloro-Bidart (2018) writes that representing the perspectives of other species is "exceedingly more complex than making sense of human experiences" (p. 255; see also Kuhl, 2011a; Russell, 2005; Russell & Spanring, 2019). As a human researcher, I am limited to my own skills in interpreting and storying what I perceive to be a shared lived experience or intra-action. My limited time on the land and my own humanness prevents me from fully understanding other creatures, including their needs, behaviours, how they are affected by things like human disturbances, and how they form a natural community or ecosystem. The short-term scale of this study may therefore fail to reach the level of complexity and nuance that could be attained through studies lasting several years. However, my observations, experiences, and research provide a glimpse into this more-than-human space.

The lack of methodological guidelines for posthuman research with young children also means that data collection and analysis was less straightforward than a traditional qualitative research process might have been. While posthumanist researchers may appreciate the messy process, it was nonetheless daunting for a new scholar such as myself. Further, I found myself

straddling many approaches in the study, especially the at times incommensurate theoretical frameworks, which was challenging to navigate. For example, empathy can be seen as a very human-centric concept and thus may not seem to be an appropriate focus for a posthumanist study, yet I would argue empathy is a key component of how we relate to others and resonates with the relational approach of posthumanism and common worlds research. It appears that the field of early childhood education for sustainability/early childhood environmental education is in the midst of a transformational shift when it comes to underlying assumptions, and my own research embodies that in some ways, as I moved through the humanist traditions in environmental education and early childhood education and toward the posthumanist possibilities that I think hold much promise for a shared future on this world.

Contributions to the Scholarly Literature

My study contributes to existing literature on forest schools, child-nature relations, empathy, and the common worlds of children and the more-than-human world, as well as offers new insights in these fields of study from a Canadian perspective. To my knowledge, no posthumanist or common worlds research with young children had been conducted in Alberta before mine, thus it offers an important piece of the puzzle. While, of course, this study is not generalizable to other contexts in terms of any interpreted meaning or “results,” it nonetheless provides a glimpse into a forest school program in Alberta and adds to our growing understanding of how forest schools are being embodied in Canada. In recent years, research on forest schools and other nature-based early learning approaches in Canada has expanded, including my own work conducting national survey studies (Boileau et al., 2021; Boileau & Dabaja, 2020; Harwood, Boileau, et al., 2020; Harwood et al., 2017), however to my knowledge no other study of a forest school program in Canada has explicitly used a multispecies

ethnography methodology until mine. With forest school programs in high demand since the start of the pandemic (Gill, 2020) and increasing interest in examining children's relations with other species, my study is timely.

My study also resonates with research that has been done internationally to examine child-weather relations and children's experiences with landscapes in outdoor programs (e.g., Blaise et al., 2019; Jørgensen, 2016; Rooney et al., 2021), as well as with work from Scandinavian countries relating specifically to snow (Bartnæs & Myrstad, 2022; Myrstad et al., 2020), to which I offer a Canadian perspective. Canadian researchers have been doing important work on decolonizing early childhood education (Harwood, Whitty, et al., 2020; Nxumalo, 2019; Pacini-Ketchabaw & Taylor, 2015) and considering Indigenous perspectives with regards to forest school pedagogy (MacEachren, 2018) and while my own study does not add much in that regard, it is nonetheless an important consideration. Other Canadian common worlds researchers have contributed to new materialist research in early childhood education (Pacini-Ketchabaw et al., 2017; Pacini-Ketchabaw & Boucher, 2019), although most materials were used in indoor settings (e.g., art materials); the outdoor context of my research thus contributes to these developing conversations on materials in common worlds. My study also adds a specific focus on child-plant relations, to which little attention has been paid to date within common worlds research.

Further, my study makes a methodological contribution. My study reveals what happens when a researcher brings together theory, her own experience, and the perspectives of many research participants, not all of whom are human, and I believe this methodological approach is one that could be useful to other researchers working in other contexts. As I had noted in Chapter 3, I found little published information on *how* other researchers had conducted their

posthumanist or common worlds research. Books such as *Feminist Research for 21st Century Childhoods: Common Worlds Methods* (Hodgins, 2019) and *Posthuman Research Practices in Education* (Taylor & Hughes, 2016), although very insightful, did not provide me with details on how to plan and carry out a posthumanist study with children. One exception would be an article by Powell and Somerville (2018) in which they describe their “deep hanging out” methodology and use of iPhones to collect photo and video data in an outdoor study with young children, although their study did not incorporate a multispecies lens. I do not claim to have many answers for new scholars following me, nor do I think there ought to be set rules or a recipe for this type of research, but I hope that my descriptive account of my processes might be valuable to other researchers as they navigate their own research.

Notably, applying an activity associated with environmental education pedagogy – the sit spot – as a research method and spending time at the research site without the human participants present were very useful ways to decenter humans in my study and to continually push me to shift my perspective away from being drawn to only the children’s experiences. Acting as a nonparticipant observer was also useful in this regard, and the GoPro cameras still captured the unique perspectives of the children that I was interested in accessing. My reflexive observation that my own empathy increased as I spent time intentionally connecting and being in the outdoor study site leads me to suggest that other researchers might also want to focus on their own experiences of empathy and affective relations when conducting similar research.

As well, by examining my data diffractively, by *thinking with*, and *wondering with* video footage, natural-cultural history, early childhood education concepts, an interview transcript, my research journal, my observations, various theories, and my own physical experience of a city park, I have created something new – or rather, made new connections that could be helpful for

understanding the common worlds of which this Canadian forest school is part. I believe that shifting our attention to the multiple beings with whom we share the world and with whom children learn and grow is crucial as we try to move forward in these times of environmental and health crises. As but one example of the challenges we face, with the alarming rates of biodiversity loss (Wilson, 2016), it is necessary to critically examine and better understand human-animal and human-plant relations if we are to move toward an ecocentric or biocentric approach to living with the natural world and all of our fellow inhabitants.

Implications for Forest School Pedagogy and Practice

It is my hope that this study will also have applications for practice, offering insights useful for educators already working with young children or those just starting out on their learning journey in early childhood environmental education. Out of my study comes a call to integrate the more-than-human world in forest school and other nature-based education practices in ways that acknowledge their contribution to human experiences, their agency as beings with a different type of knowledge of the world, and a mutual and multispecies vulnerability (Ginn et al., 2014; Taylor & Pacini-Ketchabaw, 2015). Taylor (2017) asks:

How might we reconceptualise our place, agency and learning in an anthropogenically-altered and inextricably entangled natureculture world? How might such reconceptualisations inform new kinds of environmental pedagogies that circumvent the traps of always reverting to the script of humans to the rescue?
(p. 1454)

Taylor (2017) suggests moving toward Anthropocene-attuned common world pedagogies. What might this look like in practice?

First, a shift in language would be helpful. As I have discussed throughout these chapters, objectifying other beings may be playing a role in reifying human exceptionalism. Educators can apply the language of animacy that is described by common worlds and Indigenous researchers (e.g., Blaise & Hamm, 2019; Kimmerer, 2013; 2017) by, for example, leading activities where children get to “meet” an individual tree or a bird, imagine stories about their life, or sharing and guiding observations, thus encouraging intimate contact with these beings. Educators can ask children what they imagine these beings are telling them, thank them for the gifts they offer, and perhaps even name them.

Further, I am in agreement with a group of over 80 researchers and organization leaders who recently signed an open letter to the editors of the Associated Press Stylebook to ask for a change in animal pronouns (Joint Open Letter, 2021), I suggest that educators (and researchers) avoid using *it* and *that* and *which* when speaking of the other living beings around them. This, admittedly, may be awkward at first as changes in language often are, but would speak volumes in conveying respect and care for the more-than-human. As stated in the open letter:

When gender is known, the standard guidance should be, she/her/hers and he/him/his, regardless of species. When it is unknown, the gender-neutral they, he/she, or his/hers should be used. It is also preferable to use who rather than that or which when describing any individual nonhuman animal. (Joint Open Letter, para. 10)

These guideline recommendations are for writing style, but the same can apply to verbal communication (Mann, 2020). Indeed, careful use of language around how other animals are referenced could have a positive impact on human-animal relations. I concur with

Mann (2020) who writes that “we must take responsibility for the way we look at and refer to other animals” (para. 12).

I also would recommend that educators include the more-than-human world within their documentation. Pedagogical documentation, or pedagogical narration (Province of BC, 2019), is often used to convey children’s experiences to parents, other educators, children, and the community. These may include pictures of children in action, children’s quotes, drawings, educator reflections, etc. They tell stories of children’s learning, making their learning visible. Where are the voices of the more-than-human in these documentations, especially in stories taking place outdoors? Publications such as *Outdoor and Nature Play in Early Childhood Education* by Canadian authors Dietze and Kashin (2019) can help educators see the value of taking children to play and learn outdoors. I suggest a next step toward enacting practices that consider the more-than-human world seriously would be to assist educators with tips for creating posthuman documentation whereby parents, children, and community members might learn about more than just what their children experienced and consider other members of their common worlds. As Mycock (2019) suggests, “If educators are able to notice and recognize children’s more-than-social learning, they also should be able to rethink forest school pedagogies and create a space for worldly learning to blossom” (p. 12). Atkinson (2015) provides an example what this might look like in her documentation of children’s encounters with wasps, bees, and mushrooms in the forest. Documenting this worldly learning would greatly advance forest school educational practices and might have ripple effects within the community if shared more broadly.

Suggestions for Future Research

My study points to moments of empathic interspecies relations and it is clear to me that empathy takes time, presence, and intentionality to develop. That the educator observed that the children in the program notice subtle changes in the park more quickly when they have attended the forest school for a longer period points to the possibility that forest school can help develop empathic relations. When children have regular and repeated encounters with the outdoors in all seasons and with all-world relations that co-exist in the space, they may be given a powerful opportunity to learn respect, caring, and how to live in a shared multispecies world.

Further research that builds on my study, conducted by me or by others, could take many different directions. I see much possibility in further investigating children's entangled empathy and/or interspecies empathy, including possibilities of empathy for plants or whole ecosystems. How might such empathy be facilitated in forest schools or other forms of outdoor, nature-based, or Land-based education? How might such explorations bring together insights from posthumanist and common worlds pedagogies as well as humane and other forms of animal-focused education? I also wonder what role anthropomorphism might play in children empathizing with individuals of other species (or entire species).

With several large-scale projects currently being undertaken to enhance the provision of outdoor learning for Canadian children, the education of early childhood educators on outdoor pedagogy, and the infrastructure on forest and nature school training in Canada (Lawson Foundation, n. d.), the early childhood environmental education landscape in Canada will surely change over the next few years. We will need research that documents these changing practices, and working directly with the educators on the ground, perhaps using action research or other participatory approaches, could be useful from both a scholarly and applied perspective. And, as

I reflect on my own experiences conducting this dissertation research during a pandemic, an interesting avenue of research on forest schools in Canada (and perhaps abroad) could be examining the impacts of the pandemic. How did program directors pivot to abide by ever-changing public health directives? How has demand for outdoor learning opportunities changed over this time and might it have a lasting effect post-pandemic?

Future studies should also, in my opinion, continue to seriously consider the ethics of research with non-humans within the realm of social sciences. Even if not specifically requested by ethical research boards unless one is working directly with other animals (and plants seem to be beyond the pale), it is an important consideration, especially considering we humans are not separate from nature, it is impossible to separate the social sciences from the natural sciences (Latour, 2007), and research conducted in outdoor environments, like mine was, can have impacts on members of the more-than-human world, even if unintentional. Collard (2015) calls for a “broadening the question of who ‘counts’ in research ... [which] involves different ethical considerations in the research process” (p. 133). Both Collard (2015) and Van Patter and Blattner (2020) argue that the existing REB protocols fall short when it comes to multispecies research since they tend to be anthropocentric and assume a human/nonhuman dualism. Researchers should thus seriously consider the ethics of researching in outdoor locations that are shared with biodiverse others and include them in discussions of research benefits and risks.

These are a few of the suggestions that I feel would contribute in meaningful ways to the scholarly literature, research practices, and professional practices. I want to close by turning to the words of Bastien (2004), a Blackfoot scholar, who writes, “all knowledge and wisdom comes through the alliances with insects, animals, and plants” (p. 82). Let us be open to learning from and with others.

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OWLLink Media.

Appendix A: Letter of Information for Program Director

Dear [Name of Program Director]:

I am a PhD Candidate in the Faculty of Education at Lakehead University. I am writing to invite you and the educators and children at your Forest School to be part of my doctoral research study entitled, *Affective connections at a Canadian Forest School: Children's experiences of empathy with the more-than-human world*. The purpose of this study is to explore how Forest School programs can support children in developing meaningful connections with nature and how they show empathy for the natural world.

Your program has been invited to participate in this study because it offers place-based and play-based learning experiences for children in accordance with Forest School pedagogical principles and runs for several weeks at the same location and for the same group of children. I foresee this study will run for a period of 10-12 weeks in the fall/winter of 2020-2021. I would be present at the Forest School program once per week with scheduling to be collaboratively arranged with you. We would also discuss appropriate COVID-19 safety measures and protocols for me to adopt while I am at the program such as social distancing and wearing a mask.

My observations will be focused on the children's play and their interactions with nature while taking part in the regular activities led by the Forest School educators. I will be looking for situations where children demonstrate empathy with other living beings or elements at the outdoor site. The types of data that I will be collecting are: observations of the children engaged in their regular activities documented through written observation notes and photographs, short interviews with the children in the form of "guided conversations" or "walking tours" around the Forest School that may be video recorded, and GoPro footage from cameras worn by the children.

There are no anticipated risks to the any of the study participants. I understand that having too many adults can sometimes distract children from their play, so please be assured that I will do my best to have minimal impact on the children's time at the forest school and on the learning activities led by the educators. Although I have my Forest School Practitioner's Certificate, I will not act as an additional educator but will just be an observer.

There are potential benefits to this study. As an additional adult on site, I can supervise and support children in certain activities they might be engaged in, if needed and from a safe distance. I also will provide documentation to you and the educators based on my observations that may help plan future learning activities for the group. Another benefit of this study is that it will increase our understanding of forest school teaching and learning and its implementation in Canada, help develop understanding of the role of empathy in child-nature relations, and provide insight into how well the different research methods I use work with children in an outdoor setting.

Care will be taken to ensure confidentiality of all participants. Your name and the names of the other educators and children will be changed to a pseudonym in my dissertation and any

publications or presentations. The name of your program will also be changed to a pseudonym. You will be given the option, in the consent form, to choose how you would like the location of the program to appear in my dissertation and publications. The face of participants will likely appear in pictures and videos taken during fieldwork since facial expressions and body language can be useful information to analyze. However, for publication purposes (like my dissertation, journal articles, and conference presentations), you and the other educators and the children's parents will be able to choose whether they'd like to be unidentifiable. (This is done through blurring the face of the person or careful selection of images that do not show their face or other identifiable features.) During the data collection phase, data will only be shared with my PhD committee (Drs. Constance Russell, Debra Harwood, and Sonia Mastrangelo), you, the Forest School educators, and the children themselves.

Data from this study will be analyzed to look for commonly occurring themes or situations as well as surprising or unusual moments. From these, I will create little vignettes or stories that depict children's experiences of empathy with nature in this Forest School. I will use these in my PhD dissertation and possibly in journal articles and conference presentations.

During data collection and analysis, typed field notes, photographs and videos will be carefully kept on a password protected external hard drive. Following the study, I will send the hard drive to my supervisor, Dr. Constance Russell who will have it stored in the secure data storage area in the Faculty of Education's Bora Laskin building for a period of 5 years, after which it will be destroyed.

In the consent form, there is a space to indicate whether you would like to be emailed a short summary of the research and/or be kept informed of future publications. If you do, I will send these to you when they are ready.

You are under no obligation to consent to your participation and you are free to withdraw your consent at any time by sending me an email at eyboilea@lakeheadu.ca. This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to my supervisor, please contact Dr. Constance Russell at 807-343-8049 or crussell@lakeheadu.ca. If you would like to speak to someone outside of the research team, please contact Sue Wright of the Lakehead University Research Ethics Board at [807-343-8283](tel:807-343-8283) or research@lakeheadu.ca.

Thank you for your interest in my research.

Sincerely,
Elizabeth Boileau

N.B. Please note that because of COVID-19, our research team will be required to keep logs of who is present each day for the purpose of contact tracing beyond our social circle. We will request the names and telephone numbers of you, the other educator(s), and children for that purpose. If a research team member or research participant(s) contracts COVID-19, the log would be shared with health authorities if requested. The name and telephone number of everyone present would be shared with health authorities, but not that they are part of a research study. Contact logs are kept for 30 days only and then will be destroyed.

Appendix B: Program Director Consent Form

Project Title: *Affective connections at a Canadian Forest School: Children's experiences of empathy with the more-than-human world*

Researcher: Elizabeth Y. S. Boileau

No, I do not consent to participate in the research.

Yes, I agree to participate in the research as outlined in the program director Information Letter. Specifically (please select all that apply):

- I have read and understood the Information Letter regarding the study.
- I agree to participate in the research as described.
- I understand that each educator, parent/guardian and child will be asked to participate in this study and their participation will be optional.
- I understand that a pseudonym will be used instead of the name of my program in any publication or presentation. I would like the location of my program to appear as:
 - Calgary, Alberta
 - A city in Alberta, or
 - A city in Western Canada
- I understand that I can withdraw my program from this study at any time prior to the end of the data collection period.
- I understand that my privacy and the privacy of all data will be protected and that only Elizabeth and her PhD committee (Drs. Constance Russell, Debra Harwood, and Sonia Mastrangelo) will have access to the information gathered and that all data will be kept secure for a minimum of 5 years, at which time it will be destroyed.
- I understand that I will not receive financial or other compensation for participation.
- I understand that the research team will take my name and telephone number for contact tracing purposes, and that this information will only be disclosed to health authorities (if requested) should a research team member or participant(s) contract COVID-19.

- I would like to be given a short summary of the research when it is completed.
- I would like to be informed of all publications that come out of this research. If you have indicated that you would like a research summary and/or to be informed of future publications, please provide me with your email address here:

Name of Program Director (Please print): _____ Phone # _____

Signature of Program Director: _____ Date: _____

(Please retain one copy of this consent letter for your records and return one copy to Elizabeth.)

Appendix C: Letter of Information for Educator

Dear Educator:

I am a PhD Candidate in the Faculty of Education at Lakehead University. The director of the Forest School where you are employed has consented to be part of my doctoral research study entitled, *Affective connections at a Canadian Forest School: Children's experiences of empathy with the more-than-human world*. The purpose of this study is to explore how Forest School programs can support children in developing meaningful connections with nature and how they show empathy for the natural world.

Taking part in this study is voluntary. Before you decide whether or not you would like to take part in this study, please read this letter carefully to understand what is involved. After you have read the letter, please ask me any questions you may have.

Your involvement in this study would be for a period of 10-12 weeks in the fall/winter of 2020-2021. I would be present at the Forest School sessions once per week to conduct observations. Care will be taken to keep a safe distance whenever possible in light of the COVID-19 pandemic. My observations will be focused on your normal interactions with the children and the activities you lead with the group and may be documented in the form of written notes as well as photographs and short videos. My observations will be focused on the children, but since educators play a key role in children's experiences at Forest School, you likely will be appear in some of my observations. Your teaching practice will in no way be evaluated. Other methods of data collection for this study include children wearing GoPro cameras and informal interviews with children such as guided conversations during play and walking tours of the Forest School site.

There are no anticipated risks should you choose to participate, nor are there any risks for participating children. I understand that having too many adults can sometimes distract children from their play, so please be assured that I will do my best to have minimal impact on the children's time at the Forest School and on the learning activities you will lead. Although I have my Forest School Practitioner's Certificate, I will not act as an additional educator but will just be an observer.

There are potential benefits to this study. As an additional adult on site, I can supervise and support children in certain activities they might be engaged in if needed and from a safe distance. I also will provide you with documentation based on my observations which may help you plan future learning activities for the group. Another benefit of this study is that it will increase our understanding of Forest School teaching and learning and its implementation in Canada, help develop understanding of the role of empathy in child-nature relations, and provide insight into how well the different research methods I use work with children in an outdoor setting.

HOW WILL MY CONFIDENTIALITY BE MAINTAINED?

Your name will be changed to a pseudonym in my dissertation and any publications or presentations. Your face may appear in pictures and videos taken during fieldwork since facial expressions and body language can be useful information to analyze. However, for publication

purposes (like my dissertation, journal articles, and conference presentations), you may choose whether you would prefer to be unidentifiable. (This would be done through blurring your face in any images or me selecting images that do not show your face or other identifiable features.) During the data collection phase, data will only be shared with my PhD committee, the director and other educators, and the children themselves. I will not share any recordings or photographs that identify you with anyone outside the project without your written consent.

WHAT WILL DATA BE USED FOR:

Data from this study will be analyzed to look for commonly occurring themes or situations as well as surprising or unusual moments. From these, I will create little vignettes or stories that depict children's experiences of empathy with nature in this forest school. I will use these in my PhD dissertation and possibly in journal articles and conference presentations.

WHERE WILL MY DATA BE STORED?

During data collection and analysis, typed field notes, photographs and videos will be carefully kept on a password protected external hard drive. Following the study, I will send the hard drive to my supervisor, Dr. Constance Russell who will have it stored in the secure data storage area in the Faculty of Education's Bora Laskin building for a period of 5 years, after which it will be destroyed.

HOW CAN I RECEIVE A COPY OF THE RESEARCH RESULTS?

In the consent form, there is a space to indicate whether you would like to be emailed a short summary of the research and/or be kept informed of future publications. If you do, I will send these to you when they are ready.

You are under no obligation to consent to your participation and you are free to withdraw your consent at any time by sending me an email at eyboilea@lakeheadu.ca. Should you choose not to participate or to withdraw your consent at any point, please be aware that I will continue to be on site in order to collect data on the program and other participants. Your decision will not affect your position as an educator at this Forest School and whether you participate or not, I can provide observations and documentation to you for planning purposes if you would like.

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to my supervisor, please contact Dr. Constance Russell at 807-343-8049 or crussell@lakeheadu.ca. If you would like to speak to someone outside of the research team, please contact Sue Wright of the Lakehead University Research Ethics Board at [807-343-8283](tel:807-343-8283) or research@lakeheadu.ca.

Thank you for your interest in my research.

Sincerely,
Elizabeth Boileau

N.B. Please note that because of COVID-19, our research team will be required to keep logs of who is present each day for the purpose of contact tracing beyond our social circle. We will request your name and telephone number for this purpose. If a research team member or research participant(s) contracts COVID-19, the log would be shared with health authorities if requested.

The name and telephone number of everyone present would be shared with health authorities, but not that they are part of a research study. Contact logs are kept for 30 days only and then will be destroyed.

Appendix D: Educator Consent Form

Project Title: *Affective connections at a Canadian Forest School: Children's experiences of empathy with the more-than-human world*

Researcher: Elizabeth Y. S. Boileau

___ No, I do not consent to participate in the research.

___ Yes, I agree to participate in the research as outlined in the educator information letter. Specifically (please select all that apply):

- I have read and understood the Information Letter regarding the study.
- I agree to participate in the research as described and allow Elizabeth access to my forest school group(s) on predetermined dates.
- I understand that my participation will consist of: being observed while I am working as a Forest School educator, which could be documented in written notes, photographs, or video recordings.
- I understand that my identity will not be shared and that the other educator(s), the Forest School, the neighbourhood, and the children will not be identified in any publication or presentation.
- I understand that I can withdraw from this study at any time prior to the end of the data collection period, that I may decline to participate in any aspect of the research and that I have the right to withdraw my consent for the use of any portion of data prior to the end of data collection.
- I understand that my privacy and the privacy of all data will be protected and that only Elizabeth and her PhD committee (Drs. Constance Russell, Debra Harwood, and Sonia Mastrangelo) will have access to the information gathered and that all data will be kept secure for a minimum of 5 years, at which time it will be destroyed.
- I understand that no potential risks are anticipated for me.
- I understand that I will not receive financial or other compensation for participation.
- I understand that the research team will take my name and telephone number for contact tracing purposes, and that this information will only be disclosed to health authorities (if requested) should a research team member or participant(s) contract COVID-19.
- I would like to be given a short summary of the research when it is completed.
- I would like to be informed of all publications that come out of this research.

If you have indicated that you would like a research summary and/or to be informed of future publications, please provide me with your email address here:

Name of Educator: (Please print): _____ Phone #: _____

Signature of Educator: _____ Date: _____

(Please retain one copy of this consent letter for your records and return one copy to Elizabeth.)

Appendix E: Letter of Information for Parent/Guardian

Dear Parent or Guardian:

I am a PhD Candidate in the Faculty of Education at Lakehead University. The director of your child's Forest School program has consented to be part of my doctoral research study entitled, *Affective connections at a Canadian Forest School: Children's experiences of empathy with the more-than-human world*. The purpose of this study is to explore how Forest School programs can support children in developing meaningful connections with nature and how they show empathy for the natural world.

Taking part in this study is voluntary. Before you decide whether or not you would like your child to take part in this study, please read this letter carefully to understand what is involved. After you have read the letter, please ask me any questions you may have.

Your child's involvement in this study would be for a period of 10-12 weeks in the fall/winter of 2020-2021. I would be present at the Forest School sessions and observing your child. Care will be taken to keep a safe distance whenever possible in light of the COVID-19 pandemic, and I will wear a mask if I am within two meters of your child. My observations will be focused on the children's normal play behaviours and their interactions with nature while taking part in the regular activities led by the Forest School educators. I will take written notes, including direct quotes from children's conversations. I may ask questions of children occasionally through "guided conversations" or "walking tours" around the Forest School that may be recorded. I may also take photographs of the children at play. Your child will also have the option to wear a GoPro camera to document their time at the Forest School from their own perspective. There will be two cameras available each session and the children will be asked if they are interested in wearing one on that day. These cameras are worn on a chest harness so they do not restrict movement, and will be sanitized prior to use.

There are no anticipated risks to the children who participate. I understand that having too many adults can sometimes distract children from their play, so please be assured that I will do my best to have minimal impact on the children's time at the Forest School. Although I have my Forest School Practitioner's Certificate, I will not act as an educator but will just be an observer.

There are potential benefits to this study. As an extra adult on site, I can supervise and support children in certain activities they might be engaged in if needed and from a safe distance. I also will provide documentation to the educators based on my observations which may help them plan future learning activities for the group. Another benefit of this study is that it will increase our understanding of forest school teaching and learning and its implementation in Canada, help develop understanding of the role of empathy in child-nature relations, and provide insight into how well the different research methods I use work with children in an outdoor setting.

HOW WILL MY AND MY CHILD'S CONFIDENTIALITY BE MAINTAINED?

Your child's name will be changed to a pseudonym in my dissertation and any publications or presentations. Their face will likely appear in pictures and videos taken during fieldwork since

facial expressions and body language can be useful information to analyze. However, for publication purposes (like my dissertation, journal articles, and conference presentations), you may choose to have your child be unidentifiable. (This would be done through blurring the face of your child in any images or me selecting images that do not show their face or other identifiable features.) During the data collection phase, data will only be shared with my PhD committee, the Forest School educators and the children themselves. I will not share any recordings or photographs that identify your child with anyone outside the project without your written consent.

WHAT WILL MY CHILDREN'S DATA BE USED FOR:

Data from this study will be analyzed to look for commonly occurring themes or situations as well as surprising or unusual moments. From these, I will create little vignettes or stories that depict children's experiences of empathy with nature in this Forest School. I will use these in my PhD dissertation and possibly in journal articles and conference presentations.

WHERE WILL MY DATA BE STORED?

During data collection and analysis, typed field notes, photographs and videos will be carefully kept on a password protected external hard drive. Following the completion of the study, I will send the hard drive to my supervisor, Dr. Constance Russell who will have it stored in the secure data storage area in the Faculty of Education's Bora Laskin building for a period of 5 years, after which it will be destroyed.

HOW CAN I RECEIVE A COPY OF THE RESEARCH RESULTS?

In the consent form, there is a space to indicate whether you would like to be emailed a short summary of the research and/or be kept informed of future publications. If you do, I will send these to you when they are ready.

You are under no obligation to consent to your child's participation and you are free to withdraw your consent at any time by sending me an email at eyboilea@lakeheadu.ca. Your decision will not affect your child's participation in the Forest School sessions in which they are enrolled. Each child will also be asked to personally consent to participating in this study, and I will be seeking ongoing consent from them since children can change their mind from day to day. They will always have a choice whether they want to participate or not, and they will be informed that adults such as educators or parents will not mind if they do not feel like being observed or wearing a GoPro camera.

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to my supervisor, please contact Dr. Constance Russell at 807-343-8049 or crussell@lakeheadu.ca. If you would like to speak to someone outside of the research team, please contact Sue Wright of the Lakehead University Research Ethics Board at [807-343-8283](tel:807-343-8283) or research@lakeheadu.ca.

Thank you for your interest in my research.

Sincerely,

Elizabeth Boileau

N.B. Please note that because of COVID-19, our research team will be required to keep logs of who is present each day for the purpose of contact tracing beyond our social circle. We will request the name of your child and your telephone number for this purpose. If a research team member or research participant(s) contracts COVID-19, the log would be shared with health authorities if requested. Only your child's name and telephone number, along with that of everyone else present, would be shared with health authorities, not that they are part of a research study. Contact logs are kept for 30 days only and then will be destroyed.

Appendix F: Parent/Guardian Consent Form

Project Title: *Affective connections at a Canadian Forest School: Children's experiences of empathy with the more-than-human world*

Researcher: Elizabeth Y. S. Boileau

No, I do not consent to have my child participate in the research.

Yes, I agree to have my child participate in the research as outlined in the parent/guardian letter. Specifically (please select all that apply):

- I have read and understood the Information Letter regarding the study.
- I agree to have my child to participate in the research as described.
- I understand that my child's participation will consist of: being observed at a distance and being recorded in photographs, audio, or video recordings while they are participating in regular Forest School activities, having the opportunity to wear a GoPro camera while engaging in regular activities, and occasionally being asked questions related to the research topic and their answers being potentially audio or video recorded.
- I agree to my child being identified in photographs that may be published (if not checked, photographs will have blurred faces in publications/presentations).
- I understand that neither my nor my child's identity will be shared and that the Forest School and the neighbourhood will not be identified in any publication or presentation.
- I understand that I can withdraw my child from this study at any time prior to the end of the data collection period, that I or my child may decline to participate in any aspect of the research if I or they are uncomfortable, and that I have the right to withdraw my consent for the use of any portion of data prior to the end of data collection.
- I understand that my privacy and the privacy of all data will be protected and that only Elizabeth and her PhD committee (Drs. Constance Russell, Debra Harwood, and Sonia Mastrangelo) will have access to the information gathered and that all data will be kept secure for a minimum of 5 years, at which time it will be destroyed.
- I understand that no potential risks are anticipated for me or my child.
- I understand that my child and I will not receive financial or other compensation for participation.
- I understand that the research team will take my child's name and telephone number for contact tracing purposes, and that this information will only be disclosed to health authorities (if requested) should a research team member or participant(s) contract COVID-19
- I would like to be given a short summary of the research when it is completed.
- I would like to be informed of all publications that come out of this research.
If you have indicated that you would like a research summary and/or to be informed of future publications, please provide me with your email address here:

Name of Parent/Guardian: (Please print): _____

Name of Child: _____

Family phone number for covid-19 tracing purposes: _____

Signature of Parent/guardian: _____ Date: _____

(Please retain one copy of this consent letter for your records and return one copy to Elizabeth.)

Appendix G: Child Assent Form

Project Title: *Affective connections at a Canadian Forest School: Children's experiences of empathy with the more-than-human world*

Researcher: Elizabeth Y. S. Boileau

Hi my name is Elizabeth. I want to explain why I am here today with your teachers. I am doing a research study. I want to find out more about your time here at forest school. If it is okay with you, I will sometimes be watching you, writing some notes down, taking pictures or videos of you while you play and do activities with your teachers. I might ask you some questions. I also have some special cameras that you can wear if you want. I am doing all this because I am curious to know how you are going to play and explore with nature and all the other creatures here at the park. So I will be at forest school with you today, next week and other weeks after that doing the same thing. I'm not a teacher but I can play and help you if you need me. Mostly I will just hang out and watch what happens at forest school. I am going to ask you if you want to be in my study soon. No one has to be in the study, you can decide for yourself. Your parents or people taking care of you already told me that it is okay. Can you please put your hand up if you understand what I am saying? Does anyone have any questions?

Would you like to participate in my research study?

End of verbal script. To be completed by person obtaining verbal assent from the participant:

Child's/Participant's response: Yes No

Check which applies below:

The child/participant is capable of understanding the study.

The child/participant is not capable of understanding the study.

 Child's name (printed by researcher)

 Name (printed) and Signature of Person Obtaining Consent _____
 Date