

**From Alpinism to Activism: Outdoor Athletes' Perspectives on Ecological and
Climate Learning Through Their Sport**

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Education

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Abstract

While climate change education has been studied extensively, the process of environmental and climate learning outside of a structured educational context has seen little study. Previous research has shown the efficacy of outdoor, experiential, and place-based education in facilitating ecological literacy, ecological consciousness, sustainable behaviours, and climate change awareness in school-based and public education; however, little research has been conducted to understand the development of this process outside of an educational context, nor in high-level outdoor athletes whose hobbies and/or careers often demand that they spend considerable time in nature. This exploratory qualitative study uses semi-structured interviews in a limited athlete sample (n=7) to explore the perspectives of high-level outdoor athletes on the influence of their involvement in outdoor sport on the development of their ecological consciousness, ecological literacy, sustainable or responsible behaviours, and climate activism. Findings suggest that connection to nature through sport may have a profound influence, impacting how these athletes conceptualize the environment, climate change, and their place in human-ecological systems, guiding their learning and actions. This aligns with goals of environmental and sustainability education, climate change education, and place-based education by providing insight into ways that outdoor sport may provide opportunities to engage with nature in a meaningful, authentic, and environmentally sustainable way while also enabling a deeper understanding of the potential of outdoor sport to motivate individuals to climate action.

Keywords: climate change, climate change education, ecological literacy, ecological consciousness, sustainability, environmental responsibility, outdoor athletes, climate activism, climate action, outdoor sport

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Chapter One: Introduction

Climate change is the largest global threat to human civilization in the modern era. As a human civilization, best estimates suggest that we have until 2030 to drastically reduce our carbon emissions to avoid catastrophic global climate disaster (IPCC, 2017). Though this fact is ubiquitously supported by the scientific community, implementation of measures to prevent a climate disaster have been insufficient on a global scale. As a result of slow government adoption of climate mitigation policy, a growing climate activist movement has emerged to both encourage individual adoption of climate friendly behaviours and pressure institutions to adopt policy that will make a meaningful and positive impact on reducing climate change (Martiskainen et al., 2020). In recent years, climate activism has become widespread, as individuals have rallied in support around an environmental ethic that recognizes the responsibility of the human species to protect and conserve that which we have devastated ecologically and advocates for policy and action. This activism has manifested in a variety of ways, including through outdoor athletes' environmental activism, as these individuals are often immersed in nature and thus understand what it at risk of being destroyed by both extreme weather disasters and slow-moving climate changes (Maltarich, 2020).

High-level outdoor athletes spend considerable time in nature—often, their careers quite literally depend upon it. These athletes are first-hand witnesses to the ecological changes that have occurred both from human mismanagement of the environment and from climate change. Their position has prompted some of these athletes to participate in climate activism, as they work to deconstruct entrenched paradigms that espouse human separation from and objectivation of the environment

and use their platform to encourage individuals to recognize humans and the environment as interconnected (Maltarich, 2020). In my own experience, I have found that education alone is rarely sufficient to truly change entrenched attitudes of human apathy towards the environment. Without an emotional connection to nature, individuals rarely feel compelled to act. Outdoor athletes are likely to have this emotional connection.

My interest lies in understanding the perspectives of outdoor athletes on the influence of their involvement in outdoor sport in sparking changes to their knowledge, habits, beliefs, and actions, and the implications of this for public climate change education. As an outdoor athlete, I spend considerable time in natural environments that are at significant risk from detrimental climate impacts in the near term. I have experienced first-hand the effects of climate change on places with which I have a deep connection and it saddens me to see some of these spaces lost or irreversibly altered by anthropogenic climate change.

As an educator, I believe that every individual has the capacity to learn, grow, and alter their entrenched habits to better align with a global vision of ecological sustainability (Duchi et al., 2020), as well as to lobby for broad political and structural change. I see global sustained change through climate action as the only solution to break the cycles of consumer capitalism that promote monetary gain at the expense of environmental exploitation and degradation. Central to this belief is the need for a widespread understanding of the importance of one's emotional connection to nature (Hanna, 1995; Hinds & Sparks, 2007; Restall & Conrad, 2015), and the centrality of these emotions in provoking individuals to act.

Within this thesis, the term *ecological consciousness* is used to describe individual perceptions about the interconnections of humans and nature, rejecting the ideology of anthropocentrism that places the human species above nature and defines the value of the environment primarily in its usefulness to humans, instead embracing eco-centric values that understand the intrinsic right of nature and humans to exist within a system that attends to the equal needs of both parties (Miroshkin et al., 2019). *Ecological literacy* is used to refer to knowledge about the environment that “understands environmental realities by ... identifying cause and effect relationships,” as well as the systems thinking that enables identifying the intersections of biological and sociocultural factors in a given environmental context (McBride et al., 2013, p. 13). *Climate action* is used to refer to sustainable, large scale structural, political, economic, and social actions that are specifically aimed at solving the climate crisis, reducing greenhouse gases, and mitigating or adapting to climate disasters (IPCC, 2018). The term *individual climate action* is used to refer to strategies and behaviours that individuals can employ to reduce their carbon footprint (Wynes & Nicholas, 2017). *Climate activism* is used to refer to collective mobilization to raise awareness and pressure political entities to reform policies, adopt legislation, and enact action that is widespread in nature, environmentally and socially responsible and sustainable, and has a direct impact on reducing greenhouse gas emissions and mitigating climate change (Bomberg, 2012). *High-Level Outdoor Athlete* is used to define athletes who participate in nature-based, non-motorized, lifestyle sport (see page 26 for a more robust definition).

The perspectives of high-level outdoor athletes as they develop a connection to nature and engage in climate activism is an important but often overlooked area of study, as evidenced by the lack of academic literature on the topic. This population spends considerable time in nature because of their chosen hobbies or careers, and thus may have the opportunity to develop ecological literacy and ecological consciousness in a different manner than those who are not outdoor athletes. Insights from the perspectives of these athletes as they develop ecological consciousness, ecological literacy, sustainable behaviours, and climate activism may enable a deeper understanding of how a connection to nature develops without the influence of structured education, and why some individuals are motivated to climate action and activism. I am intrigued by the possibilities that may arise from utilizing the learning and development process of outdoor athletes in the general population and in schools. Thus, my research question is: *What are the perspectives of high-level outdoor athletes on the influence of their involvement in outdoor sport on the development of their ecological consciousness, ecological literacy, sustainable or responsible behaviours, and climate activism?* This study focuses on both the affective/emotional and intellectual influences on outdoor athletes with the goal of better understanding the factors that provoke shifts in outdoor athlete mindsets towards sustainability and environmental stewardship.

Chapter Two: Literature Review

Climate change is a real and pressing threat to human civilization. Recent reports suggest that the severity and frequency of human-induced climate and weather events has increased between 2017 and 2022, which has caused “widespread, pervasive impacts to ecosystems, people, settlements, and infrastructure” (IPCC, 2022, p. 11). Climate change has had substantial global impacts on human systems and ecosystems, including, but not limited to, increased water scarcity, increased volatility in food production, large-scale displacement of individuals, decreases in mental health and wellbeing, decreased biodiversity in terrestrial, freshwater, and ocean ecosystems, and shift in species range across all ecosystems (IPCC, 2022). The impacts of climate change create both immediate and long-term vulnerabilities to human and planetary health. While the listed climatic impacts are current issues, the long-term ecological impacts of biodiversity loss, societal impacts of unsustainable resource production and consumption, and economic impacts of extreme weather events will be felt for decades (IPCC, 2022).

Current research demonstrates with very high confidence that near-term (2021-2040) warming of 1.5 degrees Celsius “would cause unavoidable increases in multiple climate hazards and present multiple risks to ecosystems and humans” (IPCC, 2022, p. 14). While actions taken to limit global temperature rise in the same time frame can reduce the severity of the projected loss, experts indicate with very high confidence that there is no action that can be taken to entirely eliminate the projected damages and losses to human and ecological systems (IPCC, 2022).

Further, experts predict that the long-term impacts (beyond 2040) of climate change will lead to further risks to human and ecological systems (IPCC, 2022). The 2022 IPCC report identified 127 key risks of climate change, many of which have mid- and long-term impacts that are multiple times more damaging than currently observed. The scale of these long-term impacts of climate change will depend strongly on actions taken in the near future to mitigate and adapt to the threat and reduce the magnitude of future warming (IPCC, 2022).

Current best practices of climate change adaptation to reduce risks and vulnerabilities lie mainly in the adjustment of existing systems (IPCC, 2022). Increasing public and political awareness is essential to this task and has already resulted in many countries and cities adopting adaptive measures (IPCC, 2022). Despite this, research has found that “most observed adaptation is fragmented, small in scale, incremental, sector-specific, designed to respond to current impacts or near-term risks, and focused more on planning rather than implementation” (IPCC, 2022, p. 22). Current and potential future adaptive measures include ecosystem restoration, sustainable and targeted ecosystem management to reduce the vulnerability of biodiversity to climate change, policies to increase food stability such as urban agriculture and farm diversification, climate change driven urban and rural planning and infrastructure development, and a transition to renewable energy (IPCC, 2022). While the implementation of these measures is, in theory, possible, the need for “effective partnerships between governments, civil society, and private sector organizations” has limited the feasibility and efficacy of these potential adaptive measures as implementation is constrained by financial, governmental, institutional, and political

factors (IPCC, 2022, p. 26). Political will and action at all levels of government is required for the implementation of adaptive measures, as are frameworks and policies that target all sectors and clearly define responsibilities and commitments to sustain climate action (IPCC, 2022). However, this action is hindered by a “lack of climate literacy at all levels and limited availability of information and data pose further constraints to adaptation planning and implementation” (IPCC, 2022, p. 28). To combat this, education is required to increase “knowledge on risks, impacts, and their consequences, and available adaptation options ... [which] can facilitate awareness, heighten risk perception and influence behaviours” (IPCC, 2022, p. 30).

Education around climate change is necessary to build this knowledge and awareness, as well as to develop climate and sustainability literate citizens who lobby for broad, sustained global climate action. It is clear that the continued lack of large-scale action by governments, industries, and corporations has led to an unavoidable dance with climate change (Martiskainen et al., 2020). The continuation of business as usual will lead to further damages, loss, and suffering. A reversal of course now to take meaningful, impactful, and immediate action to mitigate and adapt to climate change is necessary to avoid the worst of long-term climate impacts.

In this chapter I will outline common educational pedagogies for combatting climate change. I will discuss possible remedies to common issues in climate change education through pedagogies that support the development of one’s ecological consciousness, ecological literacy, and climate change awareness. I will emphasize possible connections between these nature-connective pedagogies and the outdoor athlete experience to highlight aspects of these pedagogies that may be pertinent to an

outdoor athlete population. I will explore the affective experience of high-level outdoor athletes as they participate in their sport. Research demonstrates that some individuals in this population may feel a close connection to nature and understanding how this connection develops may provide insights applicable to established curricula and climate activism. Further, I will outline my theoretical framework and contextualize these theories within the scope of this study.

Climate Change Education

Pedagogy & Issues

In the context of North American K-12 schooling, climate change education is primarily centred within the science curriculum, which presents several challenges to true climate change instruction, as it focuses solely on the scientific and cognitive aspects of the issue (Drewes et al., 2018; Siegner & Stapert, 2020). Knowledge alone has shown to be ineffective in eliciting pro-environmental behaviours and engagement in climate action; rather, personal connection to climate change and a sense of responsibility for nature is necessary to connect environmental knowledge and action (Khadka et al., 2020; Moser & Dilling, 2004; Ojala, 2012). Recent literature has argued the importance of addressing climate change from a cross-curricular, holistic, and intersectional approach to address the scope of the issue from both a cognitive and affective lens (Siegner & Stapert, 2020). Intersectional climate change education encourages climate engagement through climate literacy, climate action, and an understanding of both the anthropogenic impacts on climate change and the impacts of climate change on humans (Climate Generation: A Will Steger Legacy, 2018; Siegner & Stapert, 2020).

This model of climate change education repudiates the information-deficit model, which presumes that knowledge alone will empower the individual to act; without an emotional connection to the issue knowledge may have the opposite effect, as it often instills fear, overwhelm, or denial rather than action (Schweizer et al., 2013; Siegner & Stapert, 2020). Both Schweizer et al. (2013) and Cordero et al. (2008) found that attempts to provoke climate engagement and climate action through information alone were ineffectual, as scientific learning has not proven to lead to prolonged retention and deep learning about climate change.

Climate framing through a lens of hope has proven effective in boosting levels of pro-environmental behaviour in both children and adults. The Snyder psychological Theory of Hope demonstrates the impact of hope on an when complementing already entrenched or understood values, knowledge, and social influences (Ojala, 2011). As climate anxiety may cause individuals to reject troubling information, feel powerless to act, or “pretend that there is too much to do to solve these problems ... [or] accuse authorities or certain targeted groups or claim that they will take care of it later” (Seider, cited in Pruneau et al., 2010, p. 18), employing emotion (hope) for environmental engagement can be an effective way to change “individual and collective behaviours” (Pruneau et al., 2010, p. 18). Climate engagement mediated through emotion and hope may be effective in deconstructing the disconnect between climate change knowledge and climate engagement, especially considering the often abstract, remote, and othering nature of climate change (Khadka et al., 2020; Lorenzoni et al., 2007). Recent studies have demonstrated the efficacy of a holistic, humanities-based, and place-based framework for climate change engagement, calling for an exploration of

anthropocentrism, noting the importance of affective climate change engagement, and rooting information in culturally relevant learning, which aids in deep learning and sustained climate engagement (Schweizer et al., 2013; Siegner & Stapert, 2020).

A place-based, intersectional framework for climate change engagement enables learners to engage in meaningful climate action through community initiatives, personal connection, and intellectual understanding (Siegner & Stapert, 2020). This framework of learning fosters place attachment, whereby the individual cultivates a sense of personal responsibility for the environment and can better understand the effects of climate change on a local, personal basis (Schweizer et al., 2013). Studies show that place-attachment theory—the development of an individual’s bond to a particular location—can be influential in eliciting an emotional response that results in the formation of pro-environmental and pro-climate attitudes (Altman & Low, 1992; Khadka et al., 2020; Scannell & Gifford, 2013). Further, pedagogies of place promote place-consciousness, which facilitates the rediscovering of the self in relation to place to increase engagement and knowledge of ecological issues (Greenwood, 2013; Ontong & Le Grange, 2014; Schweizer et al., 2013). Place-consciousness aids in the development of sustainability as a frame of mind and of sustainable behaviours, as individual attitudes and proclivities are premised on concern and respect for nature (Ontong & Le Grange, 2014; Schweizer et al., 2013).

The field of climate change education provides many pathways for teaching and learning about climate change. While the literature describes some ways that individuals learn about and engage with environmental issues and climate change in isolation from the natural world, it clearly demonstrates that the development of one’s emotional

connection to nature through experience in nature can be crucial for sustained engagement and action. Pedagogies of outdoor, adventure, place-based, and sustainability education seek to develop this connection to nature through structured time in nature. While these may not directly relate to high-level outdoor athletes, and may not have been tested in unstructured, non-educational settings with them, they nevertheless provide a framework for the way that connection to nature, climate change, and climate activism *may* be learned by outdoor athletes.

Pedagogies for Connection to Nature

Pedagogies Supporting Ecological Consciousness & Literacy

Several nature-based pedagogies support the development of an emotional connection to nature through the development of ecological consciousness and ecological literacy. Pedagogies of outdoor, adventure, place-based, sustainability, and climate change education support the enhancement of ecological knowledge, place consciousness, environmental stewardship, and “the importance of the human-nature relationship” as key aims of each practice (Asfeldt et al., 2020, p. 8). While critiques of outdoor and adventure education experiences may focus on the pedagogical aims of personal growth, participants who engage with these pedagogies often report the significance of their outdoor and adventure education experiences as influential in transforming behaviour in meaningful pro-environmental ways (D’Amanto & Kransy, 2011; Ingman, 2017).

Outdoor and Adventure Education. D’Amanto and Kransy (2011) argue that while personal growth may be the focus of many outdoor education programs, living in pristine nature is often reported as personally significant to participants. These

participants report that the “awe-inspiring” nature of their experience influenced pro-environmental behaviours, as they have the opportunity to become nature-attentive—whereby they feel and reflect on what it means to be a person in the world—which requires recognition of the inherent value of nature (D’Amanto & Kransy, 2011, p. 244; Nicol, 2014). Similarly, Schwass et al. (2021) found that outdoor journeys, such as Outward Bound Canada trips, provide meaningful experiences that enable participants to deepen their connection with nature, which fosters a desire to protect these natural spaces and behaviour alterations toward environmental stewardship.

Hanna (1995) suggests the importance of developing ecocentric attitudes through both cognitive and affective channels in order to develop comprehensive and holistic understandings of the environment. Further, she asserts the importance of “providing children and young adults with direct experiences in outdoor-adventure activities and an early introduction to ecological concepts ... [to promote] a personal relationship with nature and a positive, ecocentric attitude towards wilderness and the environment” (p. 9). Nicol (2014) echoes this sentiment, as he argues for relational thinking within pedagogies of outdoor and adventure education, in particular the importance of understanding nature as an interconnected whole. This lens highlights the importance of intersectional and interconnected nature-based experiences that centre environmental and sustainability considerations through immersion in the outdoors (Nicol, 2014). While these do not explain how this process develops in outdoor athletes who do not experience nature in structured educational settings, the learning development exhibited through outdoor and adventure education suggests the potential for a similar learning process in athletes (Brymer & Gray, 2009).

Place-Based Education. Pedagogies of place-based education provide a similar framework for understanding the development of ecological literacy and consciousness. Pedagogies of place include learning centred on a place through meaning of the place, experience, environmental sustainability, and one's relationship to the place that "suggests a deeper relationship between the physical location and the social values and norms that people associate with it" (Littrell et al., 2020, p. 81; see also Semken, 2005; Semken et al., 2017; Woodhouse & Knapp, 2000). These pedagogies are instrumental in environmental, sustainability, and climate change education, as they enable individuals to connect in authentic and meaningful ways to issues in their immediate geographic location (Corker, 2017; Littrell et al., 2020; Sarkar & Frazier, 2008; Semken et al., 2017). Pedagogies of place are intrinsically tied to ecological literacy, sustainability, and climate action, as the literature demonstrates that environmental learning is more meaningful when built upon local knowledges and experiences (Littrell et al., 2020). Moreover, this connection to place facilitates the development of ecological consciousness that leads to sustainable behaviours, as it forces the individual to reconcile their personal experiences with local and cultural knowledge (Coughlin & Kirch, 2010; Gruenewald, 2007; Littrell et al., 2020).

Schweizer et al. (2013) proposed understanding place-based climate change engagement as based on place-attachment, whereby individuals develop emotional relationships with specific landscapes to "develop a deeper understanding about ecology and social interrelationships and impacts on the ecosystem" (p. 47). This framework argues for "the power of landscapes to assist in telling the story of climate

change,” (p. 47) as the authors suggest a barrier to climate change engagement lies in the abstract nature of climate change in, as-of-yet-relatively-unaffected environments.

Place-attachment has “the potential to deepen public understanding of and engagement with the complex processes of climate change” (Schweizer et al., 2013, p. 43) by facilitating both affective connections to place and ecological literacy, as individuals may better comprehend the effects of climate change on a given landscape. Schweizer et al. demonstrate the importance of a connection to place in facilitating ecological literacy as it pertains to climate change, as they found that many individuals “need to see the effects of climate change before they can believe it is real and make sustainable decisions and behavioural changes” (p. 59).

The importance of nature-based experiences to pedagogies of place-based education demonstrates the potential for ecological literacy and ecological consciousness to emerge from these practices. Investigating athlete perspectives on how their involvement in outdoor sport may lead to their connection to place is important as a step in understanding how that connection to place influences ecological consciousness, sustainable behaviours, and climate action. The athlete perspectives explored in my study examine the connections between these phenomena to better understand how outdoor sport may influence pro-environmental thought and behaviour and its possible implications for climate change education.

Sustainability Literacy and Sustainability Education. Pedagogies of sustainability education and sustainability literacy provide several important contributions to understanding how individuals adopt sustainable behaviours and may provide insights into how this process occurs in outdoor athletes. Lugg (2007) and

Parkin et al. (2004) define sustainability literacy as the skills, knowledges, and understandings necessary to integrate relationships between the environmental, social, and economic spheres of modern life. Pedagogies of sustainability education suggest that the development of sustainability literacy and sustainable behaviours can be taught, through a climate change lens, by education that emphasises strategies to alter lifestyles, economies, and social structures to reduce reliance on greenhouse gases (Anderson, 2012). Anderson (2012) found education that promoted critical individual engagement with climate change to be most effective in facilitating individual sustainable action and activism.

This potential is reinforced by Nicol (2014), as he asserts nature-based experiences to be essential to sustainable living and the potential of outdoor immersion activities to attain this goal; however, these activities must be coupled with reflexive practice that encourages exploring the implications of the experience within the context of environmental learning in order to consolidate the engagement into lasting knowledge. Through individual attention towards ecological phenomena, the individual gains the opportunity to become nature-attentive, whereby they may feel and reflect upon what it is to be a person in the world, which requires recognition of the inherent value of nature (Nicol, 2014). The potential transferability of pedagogies of outdoor education to outdoor athletes must be considered in the context of Brymer & Gray (2009), who assert:

outdoor education has a role to play in fostering this experience [of connection between humans and the natural world] ... [as] rather than cultivating an atmosphere of fearful disconnect and reckless conquest in the natural world, we

can work with extreme athletes to foster an intimate relationship by enhancing opportunities for students to [metaphorically] dance with the natural world. (p. 145)

Experiences in nature, such as those offered through pedagogies of outdoor education, that emphasize the integration of personal, social, and environmental literacy promote sustainability literacy through critical reflection (Lugg, 2007). Environmentally focused experiences allow for intersections between the cognitive and affective systems, thereby demanding that one integrate both socioemotional and intellectual learning through increased environmental attitudes and metacognitive skills (Lugg, 2007; Rickenson et al., 2004). Though developing connection to nature is not an outright goal of outdoor athletic pursuits, the experience of extended periods in nature, which are enabled through these sports, coupled with mindful reflection on these experiences, has proven effective in fostering environmental empathy (Brymer et al., 2009). Brymer et al.'s (2009) description of this reflection in extreme sport athletes, which focuses primarily on the athlete's feeling of total connection, oneness, and vulnerability with and in the environment while engaged in extreme sport, suggests that the nature of one's experience outdoors, as well as the framing of the experience, may be essential in developing ecological consciousness and an understanding of the need for sustainable behaviours (Lugg, 2007).

These findings are in line with research presented in earlier sections of this literature review, as critical climate engagement and reflection on nature experiences proves effective in altering individual thought towards personal environmental sustainability (Lugg, 2007). While this engagement has been shown to increase

environmental proclivities, the perspectives of outdoor athletes on the development of this process is not well described, as this population engages with climate change in an educationally unstructured manner.

Little research exists to suggest the similarities or differences that may occur during the development of ecological consciousness and literacy in outdoor athletes. Understanding the perspectives of outdoor athletes on this development is important, as it enables a deeper comprehension of the role of unstructured nature-based experiences, emotional connections, and inherent motivation in climate learning. Not only does this allow for a more nuanced understanding of how climate change education occurs across populations and subcultures, it also provides some thoughts about ways this learning may be applied to public and school-based education to drive higher climate engagement and action. My research details the perspectives of outdoor athletes on *how* the connection between these athletes and ecological consciousness may be influenced by their involvement in outdoor sport, which deepens our understanding of the factors that lead to environmental proclivities and climate activism, as well as their potential applications to general education.

The Outdoor Athlete Experience

Background Research

As ecological literacy, ecological consciousness, and athlete environmental activism are new and emerging fields, little research exists on the perspectives of outdoor athletes on the influence of outdoor sport on the development of these attributes. While some research has been conducted on the ways that these concepts develop within the confines of structured-school or general public-based education (e.g.,

Reid, 2019), very little research has been conducted on the way this process occurs in outdoor athletes in an unstructured, non-educational context. To ascertain the scope of existing literature, I searched Taylor and Francis Online, JSTOR, the Lakehead University Database, and Google Scholar using the following keyword terms: 'athlete environmental activism', 'environmental activism outdoor athletes', 'athlete climate activism', 'athletes and climate change', 'protect our winters', and 'ski activism'. The search terms yielded limited results and I expanded my search to include EBSCOhost Open Dissertations and EBSCO Green File and added search terms 'athletes and sustainability', and 'athlete ecological literacy'. Except for the few studies specifically focused on athlete environmental activism described in this literature review, these search terms yielded 'no result' returns. Some 'popular' websites (e.g., Callaghan, 2017; Chrobak, 2020; Mules, 2019) have collected non-peer reviewed, anecdotal narratives on athletes and climate activism; however, these snippets of information do not provide a comprehensive overview of the issue.

Athlete Connection to Nature

While there is little research explaining the ways athletes develop a connection to nature, literature exists that documents the existence of the connection and its significance to athlete climate activism (Brymer & Gray, 2009; Brymer et al., 2009; Maltarich, 2020; Mihala, 2019; Wheaton, 2007). Brymer & Gray (2009) argue that many extreme outdoor athletes find a deep connection to nature through their activities, as, while their interests in the pursuits may begin with shallow personal motives, they often grow to recognize the intrinsic value of the environment. Their study, which was guided by the question, "what is the extreme sport experience?" (Brymer & Gray, 2009, p. 5),

used semi-structured interviews, videos, academic papers, biographies, and autobiographies with 15 extreme outdoor athletes from around the world. They addressed critiques of outdoor athletes as thrill seekers with socially unacceptable learned behaviours, as historically, society has viewed these athletes as desiring to battle with, conquer, or vanquish the natural world. In contrast, their findings suggested that the relationship between the athlete and the natural world is built upon a recognition of an integrating process or journey, whereby a fluid, responsive interplay between athlete and environment exists (Brymer & Gray, 2009). Further, their athlete participants reported understanding that nature did not care about their personal successes or achievements, which they described as a humbling experience that led to a recognition of the power of nature and the ability to be in tune or connected to one's natural environment (Brymer & Gray, 2009).

Brymer et al. (2009) found that engagement in "extreme sports facilitated an engagement with the natural world, which in turn triggered a change in behaviour" towards environmentally friendly action; for example, environmental and climate consulting (p. 199). Participants reported the experience of engaging in their outdoor or extreme sport activity as being 'at one' with nature or dissolving the boundary between nature and themselves (p. 200). An anthropogenic lens would suggest that the athlete utilizes their chosen sport as a vehicle through which they may conquer nature; in actuality, the literature suggests that engaging in outdoor or extreme sport enables the athlete to feel completely immersed in, connected to, and small in relation to nature, and thus to gain perspective on one's place in the world (Brymer et al., 2009).

Wheaton (2007) details the importance of this connection, as she asserts the primary motivation for membership in British watersports advocacy group Surfers Against Sewage is concern for the ocean and the environment born through a connection to nature. It is this connection that fundamentally enables outdoor athletes to become aware of environmental issues and develop “the key ecological knowledge necessary for informed decision-making, acquired through scientific literacy and systems thinking” necessary to develop ecological literacy (McBride et al., 2013, p. 3). Similarly, Mihala (2019) and Maltarich (2020) argue that connection to nature is a fundamental precursor to environmental advocacy in outdoor athletes, as these athletes spend considerable time in ecologically sensitive areas and witness the effects of climate change first-hand. Mihala (2019) employed participant observation and semi-structured interviews with eight outdoor athletes and Maltarich (2020) utilized semi-structured interviews with seven outdoor athletes. Both studies recruited athletes who are active within the athlete activist group Protect Our Winters.

While these studies suggest a causal relationship between athlete connection to nature and the development of ecological literacy and environmental advocacy, perspectives of outdoor athletes on the role of outdoor sport in this development, characteristics of athlete ecological literacy, as well as factors that lead to connection to nature, are unclear in the outdoor or high-level athlete population. This area requires further study to best understand how these athletes develop ecological literacy and climate activism. These insights may reveal opportunities to adjust school-based curricula to improve connection to nature and facilitate deeper engagement with climate change learning.

Early Outdoor Athlete Environmental Activism

Environmental issues have become increasingly contentious (Orr, 2020). Access to education, political affiliation, and the differing impacts of climate change have resulted in disproportionate rates of environmental literacy and climate change understanding across the globe (Bedford, 2016). Though climate activism has become commonplace worldwide, athlete environmental activism occupies a powerful niche in the activist space, as these individuals, such as climbers Alex Honnold and Tommy Caldwell, ski mountaineers Cody Townsend and Hilaree Nelson, and ultrarunner Clare Gallagher, not only share from their immediate experience, but they also hold considerable influence by virtue of their elevated status in their communities (Anderson, 2011). Though the potential for widespread influence exists with mainstream sports (i.e., hockey, football, baseball, basketball, track and field), athlete environmental activism has largely existed within the fringe of outdoor sports, as evidenced by the lack of academic literature and research on mainstream athlete environmental activism. For this study, I define 'outdoor sport' as a lifestyle sport that is non-motorized and occurs primarily in a natural outdoor setting (i.e., trail running, mountain or trail biking, rock or ice climbing, surfing, windsurfing, skiing/snowboarding, mountaineering, white water canoeing/kayaking/rafting), and 'outdoor athlete' as a participant in one of these sports. The definition of outdoor athlete was crafted intentionally to eliminate motorized sports (i.e. snowmobiling, dirt biking) to define an athlete as an individual whose primary mechanism of engagement with their sport requires self-powered strength and/or technical skill.

While organized Western environmental activism has occurred since the early 1960s (and Indigenous land protection has been ongoing for centuries), athlete environmental activism rose to prominence in the mid-1990s with the United Kingdom based Surfers Against Sewage movement (Urry, 1995; Wheaton, 2007). Surfers Against Sewage was founded out of concern about raw sewage dumping on United Kingdom beaches, and, that being the case, had a membership base derived primarily from those who had first-hand experience with the sea, mediated through sport (Wheaton, 2007). This first-hand experience was cited as being instrumental to facilitating engagement with environmental activism, not just in athletes involved with Surfers Against Sewage, but also with big wave surfer Laird Hamilton, as “his participation ‘with’ the ocean through surfing led to his own environmental awakening, and to his use of surfing ... to try to affect changes in the attitudes of others” (Brymer et al., 2009, p. 199; see also Wheaton, 2007).

The importance of utilizing “the ‘cool’ image associated with the surfing lifestyle” (Wheaton, 2007, p. 285) cannot be overstated, as Surfers Against Sewage employed the ‘cool factor’ to raise funds and drive engagement in their cause. Moreover, the emergence of Surfers Against Sewage coincided with the rise of widespread internet use, and thus the athletes involved in Surfers Against Sewage employed social media in their campaigning and lobbying tactics to further extend their reach (Wheaton, 2007).

Similarly, British watersport activism in the late 1990s employed sport media to campaign for its cause. Wheaton (2007) notes the prevalence of environmentalist ideals in British windsurfing magazines through the late 1990s, as they utilized athlete environmental advertisements to draw upon the windsurfing community’s love of the

ocean to facilitate engagement with environmental activism. This was made possible in part by the creation of an “imagined community” where the language employed in advertisements, articles, and media “emphasise a community based around a particular space: ‘our’ beaches,” which enabled the subculture and counterculture that has become prevalent in outdoor and lifestyle sports (Wheaton, 2007, p. 293). Within the subculture of outdoor and lifestyle sports, using the rhetoric of environmental activism and engaging in advocacy for the protection of spaces has become necessary to be designated as an ‘insider’ within the subculture boundary, as language is the primary mechanism through which the parameters of a subculture are enacted (Wheaton, 2007).

Modern Athlete Environmental Activism

The emergence of athlete environmental activism was heavily centred both on surf activism and ski activism. In recent years, ski activism has emerged as the dominant form of athlete environmental activism, due largely to the development of Protect Our Winters, which was founded by a professional snowboarder and is invested in encouraging professional winter sports athletes to use their platform to raise environmental awareness (Protect Our Winters, 2020).

Brymer et al. (2009) studied a skier who “developed a connection to the natural world through extreme skiing” (p. 199) and used her experiences to consult and inform on issues surrounding climate change. Similarly, Mihala (2019) found that winter sport allowed athletes to connect to nature and gain a sense of freedom. Spending time in the mountains enabled them to gain a better sense of the effects of climate change, as they observed its consequences over a period of time. Mihala argues that winter sport

athletes sought out membership in Protect Our Winters to link “climate change concerns to winter sport passion,” (p. 21) as connection to nature through skiing or snowboarding led them to gain a better awareness of ecological problems.

Protect Our Winters (POW) has leveraged winter sport athletes to facilitate climate change engagement through various media, events, and initiatives that utilize the ‘cool’ factor of professional athletes. POW has created several short films showcasing elite level winter sports athletes sharing their passion for winter sport, the outdoors, and environmental/climate awareness, with epic footage overlaid of these athletes engaging in their sport (POW, 2020). This strategy is effective as the fame accompanying the professional athlete designation enables these athletes to gain a large outreach on social media (Anderson, 2011; Mihala, 2019). Further, POW has developed a school-based program, ‘Hot Planet, Cool Athletes,’ which utilizes athlete activism for a school-aged population to teach about climate change (POW, 2020).

These athletes showcase their outdoor pursuits during school visits to drive impactful conversation about climate change amongst students, and they engage in political lobbying and social media campaigns, as the literature highlights the effectiveness of social media as “a powerful tool for organizations to spread their messages and unite individuals toward a common purpose” (Terrancia-Hartman et al., 2013, p. 143; see also Mihala, 2019). This is consistent with findings from Maltarich (2020), who determined that athlete identity as professional winter athletes played a large role in the athletes’ position as climate activists. Similarly, Brymer et al. (2009) found that outdoor or extreme sport athletes are likely to engage in environmental advocacy because of their connection to the natural world.

While limited literature supports the importance of one's identity as an outdoor athlete as a precursor to environmental engagement and advocacy, little is known about the perspectives of these athletes on the role of outdoor sport in influencing how or why they develop their connection to the natural world or a sense of responsibility for the environment. Nor is there a comprehensive understanding of the factors that lead to pro-environmental or climate activist behaviour.

Influences on Athlete Climate Activism

As previously noted, many outdoor athletes are strong advocates of climate action to conserve natural spaces; however, much of this area of limited study has focused on ski or winter sport activism by professional winter sport athletes, perhaps because of the proximity of winter sport athletes to climate impacts (Maltarich, 2020; Mihala, 2019). While the motivations for these athletes to engage in climate activism may be more easily understood since the world is melting quickly, this should not discount the potential learning that may arise from understanding the motivations of other outdoor athletes to engage in similar forms of climate advocacy.

Maltarich (2020), who theorized that many professional winter athletes engaged in climate activism as a result of their intimate connection to nature, their passions, and their career dependence on winter, provided the primary influence on my thinking about athlete motivation to engage with climate action. Many of these athletes were heavily focused on ski activism as the winter sports industry is hard hit by the impacts of climate change (Maltarich, 2020; Mihala, 2019). These athletes use their platforms and wide audience reach to engage in environmental activism as they share information and encourage others to become involved in similar activist pursuits by linking climate

change to winter sport passion to facilitate a personal understanding of the impacts of climate change (Anderson, 2011; Maltarich, 2020; Mihala, 2019).

Both Maltarich (2020) and Mihala (2019) found that athlete identity as professional winter sport athletes was a large factor in encouraging these athletes to engage in climate activism. Mihala (2019) argued that lifestyle sports are seen to belong to neotribalistic categories of identity politics and subcultures that are based on shared values like freedom, a sense of control, and connection to nature. Moreover, this shared identity includes biospheric values, an ecological worldview, and pro-environmental personal norms¹, which further facilitate engagement in climate activism from members of these spaces. While these athletes embody and espouse personal action, they acknowledge its relative inefficacy as compared to engagement with government lobbying, education, a transition to clean energy, and widespread change (Maltarich, 2020; Mihala, 2019). The athletes involved in both studies expressed an understanding of their influence over their audience and a desire to use their platform and voice to help others find a way to be active in their communities.

While the literature demonstrates a connection between identity as an athlete, time spent outdoors, and climate activism (Maltarich, 2020; Mihala, 2019; Wheaton, 2007), the factors that lead to the formation of this identity and these values are unclear. Though the literature on this topic focuses primarily on winter sport athletes, the mechanism of activism across outdoor athletic pursuits (i.e. how these athletes engage in activism) may be similar, though athlete motivations (the why) may differ by sport.

¹ While outdoor athletes may hold pro-environmental personal values and engage in climate action, their lifestyles can also be highly consumptive, as participation in outdoor sports in a carbon-based society does have environmental impacts (i.e., the travel needed to access some spaces for these activities, the production of gear required for participation in these activities, etc.), and these environmental impacts can vary greatly.

Moreover, while Maltarich (2020), Mihala (2019), and Wheaton (2007) suggest childhood experiences, time spent in nature, and identity politics as factors for engagement with climate activism, further research is required to understand athlete perspectives on the influence of their involvement in outdoor sport on *how* and *why* these factors, and others, contribute in the context of high-level outdoor sports.

Theoretical Framework

Several authors inform the theoretical framework of my study. My understanding of place-based environmental learning and place-based climate change engagement is based on the theory of place-attachment (Altman & Low, 1992; Schweizer et al., 2013), whereby an individual develops an affective or emotional relationship with a particular natural space. They are thus able to see and understand the effects of climate change on that specific locale, which removes the abstract nature of climate change and may facilitate ecological literacy and action. In an athlete population, place-attachment could present as attachment to extreme, remote, or unusual spaces (e.g., a remote peak, a glacier, a specific ski line or climbing route). Further, the influence of place attachment in removing the abstract nature of climate change may prove more impactful in an athlete population, as the remote, extreme nature of their experiences may enable them to engage more immediately with effects of climate change. While outdoor athletes may anecdotally note connections to place, the importance of this connection in influencing behaviour is unknown. Investigating the factors that lead to athletes' connection to place is essential to better understand how that connection to place influences ecological consciousness, environmentally friendly behaviours, and climate action.

My model for athlete connection to nature was shaped by Brymer et al., (2009), who argue that athlete engagement with nature through sport facilitates a personal, intimate connection with the natural world. Brymer et al. (2009) suggest that the athlete-nature relationship must not be viewed as exploitive or gratuitous, but instead must be conceived of as a sort of 'dance' whereby both parties are equal partners in the relationship. This connection to nature through sport may impact athlete perspectives on climate change and climate action, as they may feel more motivated to take action to prevent the loss of spaces they frequent through their participation in sport. While this engagement has been theorized to increase environmental connection, the development of this process is not well documented, nor is the link between this environmental connection and climate activism well described. Athlete perspectives on this process are needed to better understand how they develop this connection to nature, and how this connection to nature leads to climate activism.

Brymer & Gray (2009), Brymer et al. (2009), Mihala (2019), and Maltarich (2020) informed my understanding of the link between athlete connection to the environment and athlete climate activism. Brymer & Gray (2009) and Brymer et al. (2009) document the importance of the athlete relationship to nature in sparking environmentally friendly behaviours and actions. Mihala (2019) and Maltarich (2020) argue that this connection is essential to the outdoor athlete's climate activism, as outdoor sport is the way that these individuals contextualize their lives and understand themselves in the world. Moreover, Mihala (2019) and Maltarich (2020) argue that the connection between winter sport athletes and their snow-based environments may prompt climate activism, as they are tangibly engaged with the effects of climate change like snowpack recession. This

understanding helped me contextualize the approach to outdoor athlete climate change engagement presented in this study.

Summary

Literature in the fields of ecological literacy, sustainability, climate change education, place-based education and athlete climate activism suggest the positive relationship between connection to nature, individual ecological consciousness, pro-environmental behaviours, and climate action. The research claims that these pedagogies do exert a positive influence in aligning individual beliefs and behaviours with environmental and climate friendly lifestyles and activism. Though these pedagogies focus primarily on structured educational experiences to drive this shift in mindset, the limited research on these phenomena in outdoor athletes suggests that a similar process may take place during unstructured time in nature through sport. This suggests the importance of better understanding the ways that this process may develop in outdoor athletes, which in turn may support environmental and climate change education initiatives in school-based and public education. While the reviewed research has postulated ways that athletes might engage in these lifestyles and in climate action, there is a gap in the literature on the factors that explain *why* and *how* high-level outdoor athletes develop ecological consciousness, sustainable behaviours, and climate activism.

My research helps fill this gap in the literature by documenting the perspectives of high-level outdoor athletes on the influence of their involvement in outdoor sport on the development of their ecological consciousness, ecological literacy, sustainable or responsible behaviours, and climate activism. This aligns with goals of environmental

and sustainability education, climate change education, and place-based education by providing insight into the ways that outdoor sport, by providing opportunities to engage with nature in a meaningful way, may motivate individuals to climate action.

Chapter Three: Methodology

Introduction

This is an exploratory qualitative study (Stebbins, 2001), a foray exploring the outdoor athlete perspective on the development of ecological literacy, ecological consciousness, sustainable behaviours, and climate activism in this population. I sought to understand and describe the process of high-level outdoor athletes as they develop a relationship with nature and engage with environmental issues. The study is rooted in inquiry into: the perspectives of high-level outdoor athletes on the influence of their involvement in outdoor sport on the development of their ecological and climate learning, the perceived causal mechanisms of ecological literacy, ecological consciousness, sustainable behaviours, and climate activism in high-level outdoor athletes, and the steps or stages of this learning process. The results of this study provide a snapshot of this process, which could be used as a future entry point for more comprehensive study. This chapter will outline and justify this study's methodology, research design, data collection and analysis, rigour, and researcher positionality.

Methodology

This exploratory qualitative study employs an interpretivist ontological paradigm that is rooted in social constructivism. Qualitative study is chosen to understand how these athletes² construct meaning about their experience in nature, as well as how they interpret that experience in a way that propels them to sustainability and climate action (Creswell & Creswell, 2018). A social constructivist framework allows for exploration of

² The terms 'athlete,' 'athletes,' 'all athletes,' 'athlete participants,' and 'participants' are used interchangeably in this thesis.

the lived experiences of high-level outdoor athletes as it enables an understanding of how these athletes have made sense of their world through their lived experiences (Merriam & Tisdell, 2016).

Social constructivism attends to the “multiple realities [that] are constructed through our lived experiences and interactions with others” (Chumney, 2015). Moreover, a social constructivist framework honours individual values while acknowledging that values are culturally and socially mediated among individuals and communities (Merriam & Tisdell, 2016). A social constructivist framework empowers the emergence of context-bound realities in a way that supports a nuanced exploration of the conceivably socially unconventional experiences of high-level outdoor athletes. This methodology is grounded in “understanding the experience” of developing ecologically responsible behaviours, as well as the factors that contribute to that development (Merriam & Tisdell, 2016, p. 13).

Research Design

This study employed an exploratory qualitative design using semi-structured interviews. Swedberg (2018) asserts the use of the exploratory study is “to increase the knowledge of a topic that is little known but needs to be known better” (p. 13).

Exploratory research is best when the researcher has “little or no scientific knowledge about the group, process, activity, or situation they want to examine but nevertheless have reason to believe it contains elements worth discovering” (Stebbins, 2001, p. 11).

It is relevant here due to the lack of previous academic investigation on the topic.

Exploratory research is undertaken with the goal of producing “inductively derived generalizations about the group, process, activity, or situation under study”

(Stebbins, 2001, p. 11), which “include the descriptive facts, folk concepts, cultural artifacts, structural arrangements, social processes, and beliefs and belief systems” of the group (Stebbins, 2001, p. 9). The purpose of this study aligns with the mechanisms of exploratory design, as an investigation into the factors that underlie the development of ecological literacy and consciousness, sustainable behaviours, and climate activism in high-level outdoor athletes places emphasis “directly on the causal mechanisms that underlie and produce social phenomena ... [which] allows the researcher to achieve a learning process based on the “why” and “how” something happened” (Reiter, 2017, p. 140).

Recruitment and Sample

This study employed purposeful sampling to select participants. As purposeful sampling assumes the intent of the researcher to gain insight, a population through which the most information can be learned is crucial (Creswell & Creswell, 2018). I used sampling “based on unique, atypical ... [or] rare attributes or occurrences of the phenomenon of interest” to filter for the athlete participants best suited to explore the mechanisms that underlie the phenomenon of study (Merriam & Tisdell, 2016, p. 97).

Participants (n=7) were recruited based on acquaintanceship to the researcher and fitting the criteria of the study. Criteria for inclusion involved self-identification as a *High-Level Outdoor Athlete* with high-level denoting measurable accomplishments such as athlete sponsorships or high difficulty and/or complexity of objectives completed (i.e., routes/walls climbed, lines skied, peaks summited). A high level of sport proficiency meant participants with a demonstrated record of commitment to their athletic craft. Moreover, participants were required to self-identify as a climate activist and

demonstrate engagement in climate action or activism to demonstrate an understanding of climate change and commitment to dismantling the systems that have enabled the severity of the issue.

Six participants (n=6) were approached through email and/or social media. One participant (n=1) was recruited through snowball sampling, whereby the initial participants were asked to refer other participants who may provide information-rich cases (Merriam & Tisdell, 2016). A sample of seven participants was selected, as exploratory research is “typically ... conducted with smaller samples of ... no more than 10 or 12 cases” (Stebbins, 2001, p. 30). Four participants identified as male, three as female. Participants included skiers (n=3), rock climbers (n=3), and a ski mountaineer (n=1). Participants self-identified as white (n=6), and Asian (n=1). Participant ages ranged from mid-twenties to early-fifties. Participants were in western Canada or western USA. I endeavoured to recruit participants from multiple sports to reflect varied athletic experiences. Similarly, I recruited an equitable number of male and female participants. While fame in the athlete’s community was not a criterion for selection, most athletes (n=4) had between 50,000-75,000 Instagram followers, and one athlete had over 100,000.

Table 1

Participant Engagement in Sport

Name or Pseudonym	Sport	Years Engaged in Sport
Mike	Skiing	41
Ben	Skiing, Ski Mountaineering, Ultra Endurance	26
Cindy	Skiing, Ski Mountaineering, Ultra Endurance	Professionally, 17
Curtis	Skiing	Professionally, 19

Todd	Rock Climbing, Ice Climbing, Freediving	32
Allison	Rock Climbing	18
Hannah	Rock Climbing	7

Data Collection

Participant experiences were explored through a semi-structured interview process, which sought specific information without predetermining the order or number of the questions (Merriam & Tisdell, 2016). Interviews explored participant behaviour, feelings, and interpretation of the world (Merriam & Tisdell, 2016), and were conducted both in-person (n=4) and via Zoom (n=3).

In accordance with conventions of semi-structured interviewing, an interview guide (see Appendix A) was used; however, interviews were guided by the issues explored (Merriam & Tisdell, 2016). The interview guide was piloted on an individual who fits the research criteria but was not included in the study. This helped to ensure that questions were relevant to the athlete population to provide deep insight. Interviews lasted between 45-90 minutes and were audio recorded and transcribed verbatim using Otter.ai, an online transcription software. Data were coded and analyzed upon completion of each interview to enable “*flexibility* in looking for data and *open-mindedness* about where to find them” (Stebbins, 2001, p. 11, emphasis in original; see also Merriam & Tisdell, 2016).

Data Analysis

Data analysis was a concurrent process with data collection to both align with the emergent nature of qualitative research and to allow for collected data to inform future direction (Creswell & Creswell, 2018). Audio recordings of interviews were transcribed

before being subject to line-by-line inductive and thematic coding. I coded by hand to allow for the emergence of nuanced insights and hunches (Merriam & Tisdell, 2016).

Data were organized with subject labels, names (n=1), and pseudonyms (n=6) and each interview was labelled accordingly. Data were analyzed through open coding to “[identify] any segment of data that might be useful” and codes were selected based on repeated or surprising phenomenon, or information that was explicitly stated as important (Merriam & Tisdell, 2016, p. 204; see also Löfgren, 2013). Codes adhered to a heuristic criterion whereby they were relevant to the study, facilitated thinking beyond the code, and were interpretable in their smallest component without additional information (see Appendix B) (Merriam & Tisdell, 2016).

Interview transcripts were coded with open coding and then axial coded (Merriam & Tisdell, 2016). Constant comparative analysis was employed to cross-reference each transcript to find similarities and differences in participant responses (Creswell & Creswell, 2018; Merriam & Tisdell, 2016). Code lists were combined into a master list that “constitutes a primitive outline or classification system reflecting the recurring regularities or patterns in [the] study” (Merriam & Tisdell, 2016, p. 206). The master list was used to create categories or themes that were labelled according to grouped coded data and constituted the basis of casual mechanisms from which I derived generalizations. Category names were derived from me, the researcher, and participants’ words and/or ideas (Merriam & Tisdell, 2016). Categories were created to be “*responsive to the purpose of the research ... exhaustive ... mutually exclusive ... sensitizing ... [and] conceptually congruent*” (Merriam & Tisdell, 2016, pp. 212-213, emphasis in original) and were continually analyzed to “*link the conceptual elements ...*

together in some way” (Merriam & Tisdell, 2016, p. 216, emphasis in original) to align with the aim of exploratory research to best understand the causal mechanisms that produce the phenomena (Reiter, 2017).

Trustworthiness

This study was approved by the Research Ethics Board at Lakehead University (see Appendix C). Several strategies were employed throughout this study to ensure trustworthiness of the research. Rich description and detail were used to present participant ideas, observations, and analysis to best demonstrate the logical progression of ideas and findings and “contextualize the study such that readers will be able to determine the extent to which their stations match the research context” (Merriam & Tisdell, 2016, p. 259). Similarly, as with all graduate theses or dissertations, this study was peer reviewed by my supervisor, committee member, internal examiner, and external examiner for feedback, revisions, comments, and to assess the plausibility of the findings based on the data (Merriam & Tisdell, 2016).

Trustworthiness was enhanced with a clear audit trail that details the methods, procedures, and decision-making processes of the study (Merriam & Tisdell, 2016). As this is an exploratory study that sought to provide generalizations, rather than define a theory or conclusive process, external validity resides primarily within a detailed, rich description of the setting, participants, and findings, including participant quotations (Creswell & Creswell, 2018; Merriam & Tisdell, 2016). Member checking was not employed, as many athletes interviewed were traveling or about to travel in difficult to access locales, which resulted in difficulties in communication (e.g., rural El Salvador, Antarctica) where attempts to schedule follow up interviews would have been

technologically inaccessible or, for the athlete participant, extremely inconvenient. Further, as the researcher, I assessed the rigour of the findings by reflexively appraising my own positionality toward the study, the specifics of which will be explored in the following section (Creswell & Creswell, 2018). Additionally, any negative or discrepant information that was “counter to the themes” is presented and explored in the Findings and Discussion to provide a “realistic and more valid” account of the phenomena (Creswell & Creswell, 2018, p. 201).

Researcher Bias and Assumptions

As a rock climber and trail/mountain runner, and thus a member of the athlete community of study, I have a personal connection to both the experiences of the participants and the research itself. I entered this study with the assumption that engagement with outdoor sport facilitates one’s relationship to nature and climate activism; however, I was open to this assumption being disproven through the course of this research. The potential for researcher bias lies in my connection to and involvement with the athlete community of study. I had a preconceived idea that athlete perspectives might indicate that the development of ecological consciousness (i.e., an emotional connection to nature) and ecological literacy through outdoor sport participation preceded the development of sustainable behaviours and climate activism (intellectual understanding) in outdoor athletes, as this is the way in which this process occurred for me, as well as anecdotally for several of my peers.

To combat this potential bias, I made notes during the data collection and data analysis phases to analyze my engagement with the data, be aware of the ways I discern importance from the data, and help identify thoughts, feelings, or impressions

that could lead to bias in the research (Chenail, 2011; see also Merriam & Tisdell, 2016). Further, I asked questions to specifically test the developing understanding that things worked as I expected (see Appendix A).

Limitations

While this research provides general insight into the perspectives of outdoor athletes on the influence of their involvement in outdoor sport on the development of ecological literacy, ecological consciousness, sustainable behaviours, and climate activism in outdoor athletes, the small sample size does not provide conclusive results, and consequentially these findings are not generalizable to all outdoor athletes. This study was limited by the location of participants in Western Canada and Western USA, as well as the small sample of represented outdoor sports (primarily skiing/ski mountaineering and climbing). As transferability is not the goal of exploratory research, this study does not seek to decisively define the perspectives of outdoor athletes on the influence of their involvement in outdoor sport on the development of ecological literacy, ecological consciousness, sustainability, and climate activism in outdoor athletes; rather, this study generates a tentative process that could be further explored in future research (Stebbins, 2001).

Chapter Four: Findings and Discussion

Four distinct stages emerged from the data: Experience, Observation, Learning, and Action. Athlete stories indicate that all athlete participants experienced each stage. Further, athlete responses suggest that stages may emerge sequentially and may be contingent on the prior development of previous stages (see Figure 1). This chapter will explore these stages.

Figure 1

Possible Pathways of Athlete Climate and Ecological Learning

Experience: Ecological Consciousness



Observation: Ecological Literacy



Learning: Influence & Education



Action: Activism

Experience: Ecological Consciousness

Athlete narratives suggested a shared perspective that time in nature through sport enabled them to develop an emotional connection to nature, which subsequently led to the development of ecological consciousness, as this semi-structured time in nature fostered an understanding of the interrelated nature of humanity and the

environment and enabled eco-centric values that recognise the importance of attending to the needs of both nature and humankind. Athlete responses suggest that, for this sample, various mechanisms led to the development of ecological consciousness, including adventure, connection to nature, connection with others, enjoyment outdoors, first experience, remote/hard to access, and mental and physical wellbeing. The role of each mechanism varied by athlete; however, sport-based experience in nature was central to each process. All athletes demonstrated ecological consciousness in various ways.

Participant perspectives suggested that their involvement in their chosen outdoor sport was influential in forming their ecological consciousness because of the amount of time they spent in nature through sport. Spending a lot of time in nature enabled a deep sense of connection to the natural world that was essential for the development of future stages of learning and activism. Three participants noted a first experience in their sport that became the largest impetus for the development of their connection to nature. For example, Mike, a backcountry skier, explained:

I have a moment from literally the first day I ever skied that really stuck with me ... there was a beginner trail, you know, I'd done the rope tow and kind of made it down in control. And I remember going off the bottom of the rope to a trail [that] went down to the chair But that trail did this long curve, you couldn't see what was on the other side. And I remember thinking, I really want to go down there and see what's on the other, like see what's around that corner. And that's, you know, something that I think has stuck with me through my whole life is I want to

go down this valley and I want to see what's on the other side or over that ridge.

And that curiosity has sort of kept me going for a long time.

For Mike, skiing created a sense of wonder that facilitated his connection to the environment. He described skiing as:

a sensation that's really hard to get anywhere else. It's almost like you're flying without leaving the ground ... you can jump off things and you're out in this beautiful environment. And the snow is such a magical medium to work within. It changes and is adjusting, and it can be ... deep powder one day and then icy hard the next day.

Todd, a rock and ice climber, described a similar first experience from his childhood:

I distinctly remember the first time I went climbing. I was like, 'oh my god, this is beautiful. I really love being out in nature, this is great'. It was really challenging to try and get to the top, but I distinctly remember how beautiful it was in this place.

For both athletes, the embodied experience of their first time participating in their sport helped shape their engagement in and with nature.

Ben, a ski mountaineer and endurance athlete, echoed this sentiment, as he recounted his "first avalanche class ... [in] freshman year of university." He explained:

I remember going into the backcountry, which is pretty much right next to the ski resort. But I had never even thought about doing that because I was a freestyle skier. I just hit jumps and rails and stuff. And I went to the backcountry right next to the ski resort and we're snowshoeing up or however I was going uphill. And I

asked the instructor, I'm like, 'wait we can ski up here?' And he's like, 'yep, sure can. It's a mountain and there's snow on it.' And I'm like, 'no way,' because I thought we could only ski right there where there's chairlifts I just remember that specifically that day.

Ben's first experience in backcountry terrain allowed him to experience a sense of adventure and curiosity that "really drove the rest of my life and steered me into backcountry skiing, which is now my entire life, work and play."

Athlete perspectives on the significance of their initial experience in nature through outdoor sport suggests the importance of this formative experience to their connection to, and understanding of, the environment, which resonates with findings from both D'Amanto and Kransy (2011) and Nichol (2014) regarding the personal significance of awe-inspiring experiences in nature, as this connection appears to have shaped these athletes' ideological formation regarding nature and their place within it. These experiences may be essential to athlete development of ecological consciousness as defined by Miroshkin et al. (2019), as all athletes in this study described their importance to the continuation of their engagement in sport.

Athlete stories suggest the influence of time in nature through sport on the development of ecological appreciation, and later, of concern for the environment. Though Mike stated that he likes "to get out in the summer [and] mountain bike almost every day, and ... go and hike in the mountains and whatever," he was adamant that "skiing is the connection I have, is my primary connection to the environment." Ben echoed this statement, as he stated:

There's a reason I don't do the same trail every day. There's a reason today I went and ran up a mountain that I haven't run up for a couple of months for the change of scenery, because it turns out, I'm there for the fitness and the scenery. And the leaves that change and some of the trees that change, and I noticed those things in it ... there's a reason I don't run on the treadmill every day, I run outside.

Both Mike and Ben understand their connection to the environment through the lens of sport. For both athletes, their understanding of nature was fundamentally predicated on sport-specific engagement in the environment.

Curtis, a professional skier, explained his connection to nature as:

those awe-inspiring moments that you have in the backcountry or in the mountains ... maybe you're ski touring or something on a foggy day, and then all of the sudden you break through the clouds, and you just end up having these perfect, perfect moments.

Like Mike and Ben, Curtis' perspective on the environment has been shaped by his experiences that have left a sense of reverence for the natural world. Mike, Ben, and Curtis' responses indicate that, for these athletes, this sport-mediated experience in nature not only leads to an emotional connection to the environment, but also to pro-environmental personal attitudes towards nature, as all three athlete responses contain some level of reverence or respect for the environment. This suggests that connection to the environment through sport may support the development of ecological consciousness for these athletes.

The development of athletes' emotional connection to the environment was not limited to snow sport athletes. Todd, a climber, commented that because he spends "most of this life outside ... ice climbing in the winter, rock climbing in the summer ... out in the mountains like walking, hiking, running," he feels "very close to nature, indeed ... I spend more time surrounded by nature than anything else really." Similarly, Allison, a competition and outdoor climber, noted:

when I'm high up on a climb and you're exposed, like there's just a lot of air underneath your feet and behind you, you're probably above the tree line or above the tops of the trees that are at the crag and you're getting tired and you're still trying to climb despite that. That's probably one of my favourites.

Athlete perspectives indicate the influence of embodied experience in the outdoors through sport and the length of time spent outdoors as a result of participation in sport on their connection to nature. This finding adds nuance to Brymer and Gray (2009) who wrote that many extreme athletes develop a deep connection to nature. Hannah's words suggests that this is, in part, due to the dependency that these athletes have on their environments for relative safety in their sport. She noted:

you have to rely on nature so much when you put your trust that the rock is going to hold and the tree is not going to break that you're building an anchor off and really trusting that process and that the weather is not going to go bad.

This reliance on nature for safe participation in her sport, which appears to be an addition to the established literature, informs her ecological consciousness, as she must understand her dependence on the natural world. Hannah commented that she is "trying to make [my connection to the environment] one of reciprocity. The land gives

me so much.” For Hannah, participation in outdoor sport has helped her to recognize her privilege and place in the world, as she questioned, “how do [I] connect to the natural world in a way that’s like, I don’t know, not selfish?”

Hannah’s narrative demonstrates an implicit understanding of the intrinsic right of nature to exist outside of its value to humans, as, though she depends on the natural world for participation in her sport, she also understands her inability to control natural systems, and thus that she is subject to random occurrences in the environment that regulate its balance. Her sense of gratitude towards the environment stems from her engagement in outdoor sport, as her passions, as well as her safety, are inextricably tied to nature. Hannah’s narrative indicates that the development of her ecological consciousness was supported by her connection to nature, which has increased her awareness of the interconnections between human and ecological systems.

Athlete perspectives suggest that the way they understand themselves as humans has been fundamentally influenced by the intersections of athletics and nature through experience as outdoor athletes. Ben asserted this: “I think people will say that we’re part of the environment, we’re part of nature, we’re not bystanders. And I do feel pretty strongly that that connection is pretty deep rooted.” All athletes’ statements speak to their feelings of interconnectedness with the environment during participation in their respective sport. This finding suggests that connection to the environment through sport may support ecological consciousness in an athlete population, as this connection fosters a sense of ecocentrism that understands the reciprocal relationship of humans and nature, as well as the right of both to exist (Miroshkin et al., 2019).

Athlete responses indicate that the sense of adventure provided by experience in remote, hard to access spaces³ facilitated a sense of enjoyment in nature that drove their desire to be in and engage with the environment through sport. Mike described his motivation as:

the sense of adventure that I get from what's around the next corner, what's over that ridge, what's down the chute, those kinds of things. And then that leads into travel and adventure and experiencing skiing in different cultures and different parts of the world.

Allison shared a similar sentiment, as she described a pivotal experience "at the beginning of university ... [where] I did some bigger hiking, climbing, camping trips in different parts of the world, saw different places and got really much more inspired and humbled by nature." Similarly, Ben stated:

I think I'm pretty fortunate I have that [experience in remote, hard to access spaces] literally every single day. Tomorrow marks 10 months of me doing something outside every single day like ... running, skiing, biking, or climbing. And none of those are done in urban environments. They're all done in the mountains.

For these athletes, the experience of adventure heightened the enjoyment they feel during participation in their sport. Ben noted the importance of this sense of adventure, as he commented, "I always liked skiing because I loved like the thrill of going downhill";

³ For this study, "remote, hard to access spaces" is defined as "out-of-the-way" spaces that are not immediately accessible by vehicle, to individuals who do not possess the technical skills or training to safely complete their intended objective, or in areas that would require specialized training (i.e. a Search and Rescue team) to perform a rescue (Merriam-Webster, n.d.). For example, skiing at a resort or running in a park are not considered remote, whereas backcountry skiing, which requires specialized avalanche training, or mountain running, which occurs "out-of-the-way" of most other individuals, are considered remote (Merriam-Webster, n.d.).

however, he also made clear the importance of “the whole thing [of skiing] other than just the whoo sound of the snow under my skis and my hair blowing back.” Athlete proclivity for the extreme should not be misunderstood as gratuitous exploitation of the natural world in pursuit of adventure. Ben asserted the importance of time in nature to his personal relationships, as he described:

All my relationships in my life pretty much revolve around being outside, including my family relationships. That’s what we do. When I go home, we go hiking together, we go kayaking. And I just don’t have much in my life beyond that.

Moreover, Ben noted the importance of outdoor sport to his wellbeing, as he described having to get exercise in the outdoors “every day. Or I go crazy.”

Cindy, a ski mountaineer, expressed a similar perspective, as she stated: “if I were just to sit in meetings all day, I would be so unhappy ... I feel like I’m meant to be in nature.” Having adventurous experiences outdoors through sport is a fundamental mechanism for the development of these athletes’ ecological consciousness, as the experiences have shaped how they understand the world and their place within it. Perceiving themselves as part of, rather than separate from, the environment is indicative of a high level of ecological consciousness, as defined by Miroshkin et al. (2019).

Additionally, athlete responses reveal the significance of time in remote spaces in informing their perspective, connection, and sense of responsibility. While experience in remote, hard to access spaces is vital to these athletes’ participation in their sport, and thus to their respective careers, time spent in these spaces facilitates a sense of enjoyment for these athletes, which impacts the relationship they have with nature. All

seven athletes described experiences in spaces that are inaccessible to those without extensive skill, training, and/or experience. Ben's experience demonstrates the need for these skills, as he described:

I had been learning about rock climbing and stuff. And so I kind of wanted to combine these kind of backcountry skiing skills that were being introduced to me with these rock climbing skills that I was getting trained on. And I ultimately combine those in ski mountaineering, which is kind of a combination of those skills.

Similarly, Cindy commented:

Skiers are a really interesting group because we wait for the worst weather conditions and then we go out and try to get fresh powder and we put ourselves in some really extreme environments, and it's pretty normal as a skier to be out in sub-freezing temperatures for a long time ... skiers go to great lengths to be out in some of the worst weather.

Athlete responses indicate that they feel that time in remote, hard to access spaces was influential in informing their ecological consciousness, as these spaces provided perspective on their ecological responsibility. Hannah noted:

Climbing kind of puts everything in perspective in nature. When you're out there climbing a big wall and you're at the fate of the weather or the natural elements, you kind of realize like how insignificant you are. And I think that's really important for humans to not be so egotistical when it comes to the environment and thinking we can control everything and realizing how small we are in it.

The formation of Hannah's views on the environment has fundamentally been influenced by her experience climbing and has allowed her to conceptualize the interconnections of humans and the environment. Moreover, Hannah's statement suggests that she perceives her climbing experiences in remote, hard to access spaces as influential in the development of her ecological consciousness. Allison also expressed this statement, as she described knowing "that I'm very small, and I love that being in very natural wild spaces makes me feel very small. And I hope to try to preserve some of that." This adds nuance to Mihala (2019), who wrote that experience in the mountains enabled winter sport athletes to better observe the impacts of climate change, as it suggests that time in remote spaces may also allow these athletes to foster an ecocentric worldview that is based in respect for the magnitude of natural spaces.

The development of athletes' ecological consciousness was nurtured by time spent in these wild, remote, or hard to reach spaces. Curtis stated,

I'm just so lucky through skiing. I've spent so much time in the mountains, which I think anybody that spends a lot of time in nature, it impacts them a lot. They have a high degree of respect for it.

Curtis' response indicates the influence of length of time in nature on the development of respect for the environment. The level of engagement demanded by the remote, and often risky, nature of outdoor sport facilitates ecological consciousness in these athletes, as they are forced to understand their reliance on the natural world, which fundamentally rejects the anthropocentric ideology that places humans as superior to nature, and instead compels them to adopt eco-centric values that recognize the

intrinsic value of the natural world. This may foster an emotional connection to nature that informs the formation of their ideologies about and conceptualizations of ecology and climate change, which I describe below.

Athlete narratives suggest that experience in nature through sport is influential in their development of ecological consciousness, as they perceive these experiences to foster an understanding of the reciprocal, and dependant relationship between humans and the environment, encourage the adoption of eco-centric values that recognize the intrinsic value and right of nature to exist outside of human usefulness, and support the development of an emotional connection to nature that leads to deep respect and reverence for the natural world. Athlete stories suggest that while the outcome of this process occurs for each athlete, the mechanisms through which this process transpires varies by athlete. Athlete narratives suggest that first experience, connection to nature, adventure, connection to others, enjoyment outdoors, remote/hard to access spaces, and the importance of time in nature on mental and physical wellbeing are the primary mechanisms through which this process occurs. However, all athletes shared the perspective that sport-specific experience in nature was central to each mechanism and to the development of ecological consciousness.

Observation: Ecological Literacy

Athlete stories suggest that sport-mediated experience in nature leads to the development of environmental responsibility and ecological literacy, as defined by McBride et al. (2013). Responses also suggest that the prior existence of ecological consciousness may positively influence the development of ecological literacy, as athletes' connection to the environment may predispose them to noticing ecological

changes and environmental issues. Regardless, responses indicate that participants perceived their intellectual understanding as mediated through observation, as the length of time in nature allowed these athletes to notice minute details and ecological changes that might otherwise be imperceptible to those less connected to a particular space. The observation of these details is indicative of athlete development of the systems thinking that enables recognition of environmental issues and the intersections between ecological and sociocultural factors in the environment. Further, athlete responses suggest that they perceive their ecological literacy as emerging primarily from observation, personal experience with climate change, their careers as professional athletes, and the increased risk to their career and passion posed by climate change.

Athlete narratives indicate that, much like their development of ecological consciousness, experience in nature through sport was a crucial influence on the evolution of their ecological literacy. Mike described his perspective on the importance of sport to this process, as he explained, “it’s really skiing, because I pay a lot of attention to it, where I really started to see the changes.” Mike’s awareness of ecological issues has fundamentally been shaped by the places he experiences while skiing. He noted:

It was really the glacier here at Blackcomb, the Horseman Glacier, that really brought it front of mind to me, because for 15 years straight, I spent my entire summer on that glacier. And I got to know it really, really well. And I knew every little detail and I knew where the ice came to on every part of the glacier. And sort of through the late 90s and into the early 2000s when we started hearing

more about climate change, I felt like I was watching it happen in front of my eyes because every summer I'd be like whoa, whoa you know this is changing fast.

Mike's emotional connection to the glacier, as well as the length of time spent on the glacier, allowed him to observe and recognize slow changes to the glacier across several years. This aligns with findings from Mihala (2019), who suggested that living close to and spending time in the mountains enabled winter sport athletes to gain a better understanding of the effects of climate change, as they observed its impacts over a long period of time.

Mike's depth of observation demonstrates an understanding of environmental systems, which suggests evolving ecological literacy. Personal experience with climate change in a place Mike felt connected to enabled him to understand the interconnection of ecological systems in a transferrable way. He commented:

My way I think about the world is shaped by my experiences. And I definitely feel like the more I'm out [in nature], the more I see. These things [environmental changes] are so obvious to me and I pick up on new things all the time. Like, all this talk about old growth forest over the last couple years, I've started to understand what's going on in these hills right here. I mean ... I live right over there. And these hills back here have a mix of second growth and old growth and it's become so striking to me once I knew what to look for, the changes between the two, and the ecosystems and all this kind of stuff.

Mike's narrative indicates his understanding of the intersections between ecological and human systems in each environmental context. Moreover, his lived experience with effects of climate change in areas he frequents facilitated the development of his

awareness of other ecological issues, as he noticed that “the more I was out there, the more I saw, the more I would see.”

For Mike, an understanding of the complexities of ecological systems arose out of his own observations while immersed in nature through sport. Mike commented on this process, as he described himself

as someone who’s out in the mountains a lot and out in nature, be it the mountains or the ocean, or wherever, I feel like I’m a fairly observant person. So I’m always picking up on these cues. And when you spend a lot of time in a familiar set of mountains, for example, you can see change over time. And so, I feel pretty in tune with things like even to the point where after the hot spell this summer, the heat dome, I started to notice individual trees around my neighbourhood; I was like, that tree is really suffering from the heat. Like that tree, all of the sudden, just went orange. And what’s going on? And so, I feel like I’m fairly sensitive to those things because I’m not just out there ... walking around or listening to music. I’m often, when I’m out there, I’m looking around at the things that I’m observing and maybe even to a certain degree even measuring, you know, when I’m travelling on glaciers, I’m always looking, like wait a sec, there ... used to be a crevasse over there and it’s not here anymore, now there’s a rock there, that kind of stuff. So, I feel pretty in tune with nature. And I feel similarly about the ocean and some of the places I’ve been to where I see changes in reefs or in shoreline structure over time.

Mike’s ecological literacy arose out of the amount of time and observations he made, principally while engaged in skiing. Though his awareness of ecological issues now

extends beyond those he encounters while engaged in sport, the impetus for this understanding is firmly rooted in his lived experience as a skier. This experience has allowed him to observe the cause-and-effect relationships that have led to various ecological issues, as well as their intersections with human activity. The stated importance of observation to Mike's understanding of environmental cause and effect relationships and systems environmental thinking—or ecological literacy, as defined by McBride et al., 2013—suggests that observation via sport may be a foundational mechanism through which ecological literacy develops in an athlete population.

Allison shared Mike's perspective of the importance of this sport-directed time in the environment, as she described:

climbing ... [as] this a way to be in nature and not really have to be doing something. Very often I'm, quote unquote, climbing outside and very often I'm happy to just go and sit in the forest for a day. Not really do anything but just be and look at things closer. The way you do when you're climbing you look, you see a cliff, but you look very specifically for the holds, the handholds and footholds, the movements, and I'm happy to also just sit in the forest and look very specifically at parts of trees, dissect things a little further, look closer.

The essential nature of fine details in climbing has trained Allison to observe details in the environment that are not immediately obvious. While she described this skill as first emerging within the scope of climbing, her response exhibits the transferability of her learned ecological attention. Like Mike's experience skiing, Allison's ecological literacy relates to her lived experience as a climber.

Allison exhibited a high degree of awareness regarding sport-specific ecological issues as she described the destruction of a bouldering area in South Africa. She stated,

a lot of those boulders actually were destroyed by some raging wildfires there and then some raging wildfires combined with really, really unseasonably heavy rains. Because they were sandstone ... all the water and the heat destroyed a lot of them.

Allison's understanding of the fragility of sandstone rock, as well as the factors that led to the destruction of sandstone, exemplifies the sport-specific nature of ecological literacy development in athlete participants.

Athlete responses indicate that the development of ecological literacy through observation occurs across outdoor sports. Curtis commented, "you really have to listen to what the mountains and the environment is saying." For Curtis, this observation, in part, developed out of necessity, as he described the need to "[be] aware of your surroundings and listen to [them] instead of trying to force your way into it ... [because] whenever you force your way into those situations bad things generally happen." As a backcountry skier, the ability to understand the environment and the ecological factors that lead to a (relatively) safe versus dangerous skiing situation is a necessary skill to mitigate risk. Curtis elaborated on this notion, as he stated:

ski touring ... really slows everything down. And you really see these [snow] things change. And it really helps you gain, especially like backcountry skiing, you're basically making an educated guess the whole time with stability, stuff like that. So, you really want every little detail possible to make that decision. So,

you're making the best decisions possible, because it is like you're taking all these things that you've observed throughout a day to make that decision.

Curtis' narrative suggests that observation, developed through experience in nature via sport, enables systems environmental thinking that allowed him to make thoughtful, educated decisions while in the backcountry. This methodical approach learned through skiing is indicative of emergent ecological literacy, as McBride et al. (2013) assert that systems thinking that identifies the intersections between various environmental and social factors is symbolic of ecological literacy development. Though Curtis's observational skills developed out of his experience as a skier, they were equally transferrable to his emerging pursuit as a small-scale organic farmer. Like skiing, Curtis noted that within farming:

trying to work within the laws of nature is super, super fun, because generally forcing it doesn't work. You have to do a lot of learning to figure out the problems and not just be trying to make a quick buck or something. Quick, quick solutions to problems generally don't work. It's like finding the root cause and going back and figuring out how we can make this a better way to do things.

Here, Curtis's ecological literacy skills have transferred from skiing to farming, as he utilizes similar language to describe the process of observing and synthesizing information. Moreover, he explained:

with the diversity of crops that we grow, that's kind of your insurance policy, depending on your summer. So, if you have a cooler summer, your cool crops will do better. And then if you have a hot summer, your hot crops will do better. But it kind of evens out across the board because of having this diverse farm,

which I think is kind of interesting, like not putting all your eggs in one basket. It's an interesting way to kind of live in nature like that.

Curtis's ability to understand the consequences of weather on his crops, as well as his ability to integrate information into his decision-making process while farming can be traced back to his experiences skiing. He described the importance of this observational process to skiing as:

when you're really patient and listening to the mountains and observing correctly, and, I mean, part of it is for sure experience, but when you really find out, when you're like today is the day, this is perfect to go and do whatever it is you want to do.

Curtis's understanding of ecological systems, the interplay between various ecosystems, and the relative impacts of several factors on both snow and crops is indicative of a high degree of ecological literacy. His responses demonstrate the development of this ecological literacy because of his time in nature through skiing, which has since proven transferable to his venture as a farmer. This finding supports Schweizer et al.'s (2013) notion of the role of landscapes in developing an understanding about ecology, as well as reinforces findings from Brymer et al. (2009), who suggested a causal link between an athlete's connection to nature through extreme sport and their knowledge of ecological interconnections. Moreover, these findings reinforce Mihala's (2019) findings, which suggested that winter sport enabled athletes to observe the effects of climate change over a long period of time, and thus to gain a better understanding of its consequences.

While Mike, Allison, and Curtis shared the perspective of the importance of sport on their personal observations of climate change and ecological issues, Ben also commented that both sport and the outdoor industry help bring attention to the immediacy of climate change. He described “very much a concerted effort to care about climate issues in the outdoor industry ... [that is] pretty hard to ignore, especially as an athlete working with these brands.” Though Ben concedes that other athletes “don’t have to take it [environmental activism] to the extent that I’ve taken it,” he contends that “it’s just not something that can be ignored”. Ben’s narrative aligns with findings from Mihala (2019), who suggested that identity politics may influence outdoor athletes to environmental activism, as the subculture of outdoor sport is based, in part, on shared values of environmental care and conservation. Further, he asserts the role of outdoor sport and the outdoor industry in calling attention to these concerns, as:

you can’t go to a ski resort and just go skiing and go home and not have some experience where there was a booth set up or you realize, hey the snow line is like 20 feet higher than it was last year ... it’s going to be in your face.

That being the case, Ben believes that “as time progresses, both with like the environmental movement and with climate change, it’s going to become increasingly in the face of everyone who spends time outside,” and thus, that outdoor sport is primed to call attention to these issues. For Ben, the observations that one can make through participation in sport, in this case skiing, will “[cause] more people to have some alarm and to hopefully do something about it ... including our policymakers.”

Here, Ben describes his belief in the importance of the observation to the development of ecological literacy. His perception of the obvious nature of climate

change to those who spend time outdoors, and thus of the role of observation in developing one's understanding of the climate emergency, reinforces the notion of development of ecological system awareness through observation. Athlete responses attribute the impetus for this observation to their personal experiences with climate change as a result of their involvement in outdoor sport and careers.

All athletes interviewed shared stories that indicated that their personal experience with climate change and environmental issues through sport was a mechanism through which they developed ecological literacy and an understanding of interconnected systems. This finding resonates with Schweizer et al. (2013), as it reinforces their notion that individuals need to see the effects of climate change in order to take ecologically responsible action. As a result of their personal experience with these issues, athletes were motivated to learn more about ecosystems and find ways to become involved in environmental solutions. Hannah's story of her first-hand experience with climate change while on a climbing trip demonstrates the importance of both sport and personal experience to stimulating ecological literacy. She commented:

When I was in Peru, we were in this town where the water source was drying up. And you're like, what the? How can I just go on a climbing trip and just go home like everything's normal? How do we get more involved in more things?

Hannah's experience with climate change in Peru is a completely different type of encounter than observing changes in a place she knows well. Nonetheless, her observations led her to better understand the complexities of ecological issues, as well as the human factors that contribute to the immensity of these issues. She noted that a large part in her understanding of ecology and climate change has been:

understanding the reciprocity of that [human-nature] relationship. I think as humans ... we see ourselves at the top of the chain, and then everything else is for us to take and to use. Understanding that that's actually not how it works. And when we're a closed part of a closed system that we all rely on each other.

Hannah demonstrates her comprehension of cause-and-effect ecological relationships and the environmental-sociocultural intersections of environmental issues.

Similarly, Mike noted that his awareness of environmental issues derived from "the overwhelming obvious sense of change that I was having," as "through the late 90s and into the early 2000s when I started hearing more about climate change, I felt like I was watching it happen in front of my eyes." Moreover, Ben's "really in your face" personal experiences with climate change and environmental issues deepened his observations and understanding of ecological issues. He described

moving to Utah, in Salt Lake City, [which] will sometimes have the worst air quality in the entire world We've all moved here for the mountains and stuff and yet we're living in like this freaking terrible air quality ... that's one thing that's really been in my face.

Ben's understanding of "the difference between weather and climate," which he described as "climate is what you expect, weather is what's happening," is indicative of his awareness of human and ecological systems, as he noted that "[the climate] has changed enough we're like, that is what we expect back home in Ohio, to just like not be able to ski for the entire winter."

Ben's description of the difference between climate and weather through skiing and outdoor sport exhibits the importance of sport to his ecological literacy

development, as his reference for and understanding of the world is fundamentally shaped by his experiences as an athlete. This aligns with findings from Brymer et al. (2009), who found that engagement in extreme sport while immersed in nature enables the athlete to gain perspective and understanding of their place in the world. Todd echoed this sentiment, as he “got this really distinct and obvious awareness that the climate is changing.” Todd noted that he felt his awareness of climate change stemmed from “ice climbing and being surrounded by glaciers a lot of the time in the winter and watching them change and recede in many parts of the world.” His experiences with climate change through rock and ice climbing has caused him to question, “why is that happening?”:

As an ice climber, I’ve seen the glaciers recede dramatically, and ... from the rock-climbing spectrum, have just been in Squamish looking at The Chief that has had a dramatic change⁴ recently.

Athlete descriptions of their personal experiences with the climate crisis show the importance of these events to fostering their awareness of, and interest in, environmental systems and issues, as these experiences have forced athletes to understand the causal impact of climate change on the spaces they frequent for sport. Athlete responses suggest that this awareness leads to the necessary systems thinking described by McBride et al. (2013) as indicative of ecological literacy. For example, Cindy noted:

⁴ The Stawamus Chief, a popular rock-climbing location in Squamish, BC, has had several, large, independent rock falls in 2021, which are believed to be caused by the unusual warming/cooling cycles in British Columbia (Brend, 2021).

I think we've all become more aware of these connections [between human actions and environmental consequences] because of the climate crisis. Because our snowpack is so much less than it used to be, and we're seeing these big droughts, and the drought in Utah and across the Mountain west has really worsened. And we're seeing the wildfires. And so, I think that that's the way that it's become. It [athlete interest in the environment] started just from the fun, but now it's the crisis.

The immediacy and prevalence of climatic and environmental issues is felt through outdoor sport, as the increased risk posed by climate change has forced these athletes to alter the ways they approach their sport and their careers.

This finding resonates with both Maltarich (2020) and Mihala (2019), who found that winter sport athletes were heavily focused on ski activism because of their career dependence on snow, as well as the impacts of climate change on the winter sports industry; however, my findings suggest that this career and passion dependence on nature also fosters ecological understanding and literacy in these athletes, as the increased climatic risk is a mechanism through which athletes intellectually conceptualize climate change. Moreover, this dependence is not limited to winter sport athletes, but can also be extended to rock climbers, who are primarily summer sport athletes.

Athlete observations of climate change, environmental issues, and ecological systems were made personal through their experience as high-level outdoor athletes, as well as the increased risk that climate change posed to their respective careers. Cindy noted the increased risk that accompanies her career, as she stated:

Skiing has become more difficult to do, I think because of climate change ... a lot of the lower elevation trailheads that we used to be able to ski tour from, they just don't get the same snow as the upper elevations. And so everyone is kind of pushed together into this smaller part of the mountain range here. And it puts a lot of people on top of each other, and it creates more risk⁵ when you have a lot of people backcountry skiing in a small area.

Moreover, Cindy noted that her awareness of climate change grew as she:

used to be able to depend on certain things like certain lines, certain times of year being a bit more stable than they are and I think there's just a lot more uncertainty in terms of conditions. You just really don't know what you're going to get.

The increased uncertainty and risk placed on these athletes as a function of the intersections between their careers and climate change demands that they develop a complex understanding of the interplays between human and ecological systems. In turn, this reinforces the notion that increased climatic risk in high-level outdoor sport, and the observations that this risk necessitates, are a mechanism through which ecological literacy may develop. Todd's experiences support this idea, as he commented that "to be able to get to places to go ice climbing is more challenging or can be more challenging than it used to be." In addition to the threat posed to athlete physical safety, athlete responses indicated that they have become trepidatious about participation in their careers, as climate change has threatened the longevity and security of their professional athletics. Curtis stated:

⁵ Of avalanche.

If you're a skier in California these days, I'd be kind of worried about my job security personally. Just in terms of snow conditions, it's really challenging, and they really have to travel a lot to get what they want.

Moreover, Curtis noted that "we're talking about climate change because our jobs depend on it. I think there's more to it on our [pro-environment] side; I think we care more about the environment changing than just our jobs. But it is true."

Curtis' statement reinforces findings from Maltarich (2020) and Mihala (2019), both of whom suggest that professional winter sport athletes engage in climate activism in part as a function of their career dependence on winter. Similarly, Ben commented that professional athletes' "lifestyle and livelihood are wrapped up in this [climate change]. It's their lifestyle in jeopardy ... they can no longer avoid it and ignore it." The enmeshment of career and passion in professional outdoor athletics presents a unique threat to these athletes, as they risk losing not just their jobs, but also their way of life. Sport-enabled athlete observations of environmental issues and climate change impacts appeared to have had a transformative effect on athlete interest in and motivation to learn about ecological issues.

Athlete perspectives of the importance of sport in enabling observations and personal experiences with climate change to their intellectual understanding of the interplay between human and ecological systems suggest that these experiences contribute to the development of their ecological literacy, as defined by McBride et al. (2013). These observations led athletes to understand environmental issues, ecological cause-and-effect relationships, and the intersections of ecological and socio, cultural, and economic factors in environmental issues.

These personal experiences with climate change have often threatened not only the career stability of these athletes, but also their personal safety, as several athletes commented on the increasing climate change-related risk that they face while engaged in their respective sports. However, further research that focuses on the perceived influence of sport on these observations in a larger athlete sample across a range of summer and winter sports is needed to explore the importance of this personal experience across all outdoor athlete populations. Athlete narratives demonstrate that observation, personal experience with climate change, the increased risk to personal and job security, as well as their experiences as professional athletes has led to the systems thinking defined by McBride et al. (2013) as symbolic of ecological literacy, as these mechanisms enable athletes to intellectually conceptualize causal relationships in, make decisions about, and responsibly respond to, ecological issues and climate change.

Learning: Influence & Education

Athlete stories highlight the importance of external influence in the process of their learning about climate change and environmental issues. Athlete responses suggested that their intellectualization of climate issues was a result of the education they sought or received, as well as the influence of key figures in their lives. Though athletes had a broad range of educational experiences, responses nonetheless indicated the importance of some form of external learning on their understanding of climate change. Athletes indicated that their learning was heavily centred on learning to be more environmentally sustainable, or responsible in the case of several athletes who described their dislike of the word sustainability. Athletes attributed the development of

this learning to a mix of formal education, family influence, mentor influence, and/or peer or athlete influence, which led to an understanding of human systems and relative impact, an essential concept for their perception of their relationship to climate change. While athletes did not perceive all mechanisms of their environmental learning as directly tied to experience in high-level outdoor sport, all nonetheless asserted that these sport-specific experiences provided their foundational connection to nature and were the catalyst from which their desire to learn about sustainability or responsibility derived.

I asked athletes to describe their perspectives of influencing factors on their intellectual understanding of sustainability; however, most athletes indicated that they prefer to eschew the word 'sustainability' in favour of the term 'responsibility,' as they find 'sustainability' to be a greenwashed buzzword. Cindy commented that she does not

really like the word sustainability because ... a lot of my views about how to be an activist have been shaped from the past decade that I've been a Patagonia ambassador ... the Patagonia founders wrote about a responsible company. And one of the quotes that they say that has really shaped my view about sustainability is that there is no human economic activity that is truly sustainable. And so instead I like to think about the word responsibility, because sustainability is just a buzzword that's kind of thrown around, but I don't know that it's truly possible to live completely sustainability. Everything we do has an impact.

This view has shaped Cindy's approach to minimizing her impact on the planet. She explained: "I think that knowing what the impacts are and taking responsibility is more of the way that I like to approach my work and career."

Cindy's preference for 'responsibility' over 'sustainability' indicates her belief that while sustainability may be an unattainable goal in its most literal sense, human activity can and must be altered to become more responsible to the Earth and its inhabitants. Ben echoed this preference for the term responsibility when asked about his views on sustainability, as he stated "I think responsible is the word that comes to mind. Obligated is another word that comes to mind." For Ben, the term responsibility represented striving "to have a more positive impact or less of a negative impact on the planet," whereas he felt sustainability represented a term "that I'm not even interpreting ... or using in the way it should be interpreted." Still, some athletes had no preference for either term, as they felt that they were synonymous for the same target behaviour.

Hannah described "sustainability, responsibility, for me, is being honest with your actions, and being honest with what you're taking." She also felt that "sustainability ... kind of means taking ownership for my actions. Not being apathetic towards what's going on, doing my best to learn and be a better person on this planet." Similarly, Allison described sustainability and responsibility as "being aware of one's carbon footprint. And what aspects of your life have more or less impact on that. What you can personally do to reduce your carbon footprint ... trying in a little bit of researching and learning." Regardless of preferred terminology, athletes indicated that the process of learning to be more sustainable or responsible included becoming aware of one's carbon footprint, one's impact on the Earth, as well as how they could each reduce human impact on the Earth, both personally and professionally. This aligns with descriptions of sustainability literacy from both Lugg (2007) and Parkin et al. (2004), both of whom defined sustainability literacy as the requisite skills and knowledges to

conceptualize the intersections between the environmental, social, and economic spheres of society.

Though each athlete indicated that external influence was essential to their learning, their relationship to these external influencing factors varied widely. Four of the seven athletes perceived the importance of formal education and research on their learning, as well as seeking opportunities to learn from experts in the climate and environmental science fields, which reinforces Anderson's (2012) notion that sustainable, or responsible, behaviour can be taught through a climate change lens by pedagogies that emphasize environmentally responsible lifestyles, economies, and social structures that reduce reliance on greenhouse gas emissions. Hannah's formal learning came from her background in university "for environmental economics," where she "was super involved with a lot of projects around [the] Enbridge pipeline." Similarly, Allison's undergraduate experience led her to learn about "technologies that people are trying to use for direct air capture or something of carbon."

Cindy's initial formal learning came from:

high school ... [where] I took environmental science and ... competed in environmental science competitions I learned a lot. And I saw how everyday people can come to the table as citizen activists and use the government as a problem-solving tool. And so, I learned about how to be a citizen activist, a better citizen activist, and I would say that's really helped to inspire what I do now.

For Cindy, formal education not only provided the opportunity to begin to learn about climate change and environmental issues, but also provided valuable experience in activism that has informed her approach to her career as an athlete activist. While she

asserts that her experience as an outdoor athlete is essential to her current participation in climate activism, her formal education nonetheless enabled her understanding of the importance of collective, political action, which has become her primary focus throughout her activist career.

Hannah, Allison, and Cindy pointed to formal educational experiences as crucial to their understanding of climate change. Similarly, though Ben's academic background was not in the field of environmental studies, he described "understanding that there are experts on this [climate change] [and] we need to listen to them." Ben noted his experience attending COP21 in Paris as an athlete delegate for the outdoors industry, where he "attended a bunch of informational stuff there with a bunch of scientists on panels." He described his role in learning as:

[understanding] the thesis of what's being said. And I think that's really where my understanding can stop. It doesn't need to stop there, but it can stop there.

Because again, I'm not the scientist. I didn't study these things. But what I can do is listen to those who did ... [so that] the stuff I can remember is important to me ... and I can talk to a legislator regarding these things that actually might make a difference.

As Ben's formal education was not in the field of environmental studies, he sought opportunities to learn from experts in order to better understand how he can be a responsible citizen and athlete, as "it was really just education that ... taught me that these are the things that matter, like policy changes." For Ben, semi-formal education delivered by experts provided meaningful learning about climate change, sustainability/responsibility, and climate action.

Both athletes who indicated that formal education and research was influential to their learning, as well as those who did not, noted that personal influence in the form of a mentor, a peer or athlete peer, or family was crucial to their environmental learning. Hannah and Cindy, who had the experience of formal environmental education, noted the importance of mentorship in informing their learning. Hannah “did a bunch of research with my professor against [the Enbridge Pipeline],” in addition to “living with David Suzuki’s family” while in university, which allowed her to “[see] everything through a different lens ... [and realize] I need to be better I really need to change.” Similarly, in her last year of college, Cindy “had a professor and ... took a class in American national government. And ... learned from [the] professor really a lot more about how to get engaged as a citizen activist.” Both Hannah and Cindy described the importance of mentor influence in furthering their intellectual understanding of environmental issues. For both athletes, while mentorship was important in their environmental learning, it was crucial in their formation and enactment of activism, as it enabled them to learn impactful methods for involvement in climate activism.

Other athletes perceived peers and fellow athletes as the influential figures who aided their learning. Allison commented that “it was really getting involved with or talking to other athletes who are involved in POW [Protect Our Winters] and other environmental organizations that kind of pushed me to get actually involved.” Allison also described:

talking to some of my friends, and they had started to do this, to try to combine as many airplane trips as possible, so that you’re not just flying somewhere for a weekend. The idea is to not fly anywhere that would be less than a five-day trip,

that would need to be a five-day trip. So not flying to Mexico for a weekend vacation kind of thing. It's like, you're going somewhere for a work trip—it needs to be in person.

Allison's action demonstrates her perspective on the importance of peer influence and accountability, both in learning and action, as this influence fosters pro-environmental conversation, ideas, and action. While this aligns with findings from Mihala (2019), as it reinforces the importance of subcultures and identity politics in influencing one's behaviour, my findings demonstrate that belonging to a group may not be sufficient to influence thought and behaviour; rather, direct influence from members of the group who are already performing the desired thought or action may be more influential in informing behaviour than group affiliation alone. Ben noted that his learning was also heavily influenced by the climatologists and glaciologists of the Protect Our Winters Science Alliance. Mike pointed to meeting environmentalist Bill McKibben at a film fest as something that “certainly had a bigger effect on me,” as “I read his stuff every day pretty much. He's a person that has a big effect on the way I think about these things.”

As indicated by athlete descriptions, peer influence was one mechanism through which athletes learned about environmental responsibility and climate change. This finding adds nuance to Wheaton (2007), as it suggests that rather than the importance of an 'imagined community' alone, direct influence from a member of one's subculture group may be crucial in influencing environmental activist behaviour as individuals are influenced by others within the group and work to stay on the 'inside' of the subculture.

Some athlete stories indicated that family influence was an additional mechanism that facilitated ecological learning. Ben noted the importance of this familial influence, as he commented that “I was kind of raised to be connected to the environment, which I think is a pretty common sentiment among people who are now advocating for our planet and its people.” He perceived this early influence as particularly significant, as he commented that environmentalism has “just kind of always been part of my ethos. I was raised understanding what climate change is,” and “it was just something about where I was raised or the way I was raised. I just feel this responsibility [to the environment].”

Curtis cited a similar influence, as he recalled:

my parents did a very good job of giving a good understanding of consumerism, and that you don't need all these things and buying the things that are important to you ... more on a moral level of my upbringing.

This sentiment was again reflected in Cindy's description of her childhood, as she described:

a spirit in my family about frugality, and just trying to have a lighter impact on the Earth too I mean, my parents, I wouldn't say they're environmental activists; however, we would just go on these backpacking trips, and I'd learn about Leave No Trace Ethics.

Athlete descriptions of influential figures in their learning demonstrate the importance of surrounding oneself with environmentally minded individuals. The importance of external figures on *athlete* ecological learning appears to be an addition to the established academic literature. Importantly, athlete stories described influences on learning that accompanied, were derived from, or followed the establishment of their

connection to the environment, as athletes perceived the importance of this connection to spurring an ethos of care that sparked their interest in environmental and climate learning. Though some athletes had connective experiences that pre-dated their involvement in sport, all asserted that connection to nature through sport was the catalyst for sparking their ecological learning and climate activism. This is discussed in further detail in the section *Action: Activism*.

Athlete narratives indicate that their ecological learning has led to a strong understanding of the complexities of climate and environmental issues, as responses demonstrate an awareness of the intersectionality of human social, political, and cultural systems with the climate crisis, as well as the relative impact of inequity in climate action. Athletes indicated the importance of sport to broadening their perspective on this issue; for example, Hannah commented that “getting into sports, spending more time outside, travelling and seeing different parts of the world and realizing [my] impact” was influential in helping her understand her place in the environmental crisis. Hannah noted that these experiences made her:

a more cognizant, sensitive person, especially when you're travelling to new areas [for sport]. And just the environmental concerns there. I think always these environmental concerns come with a human element too and making sure that the actions you take are trying to minimize these impacts on not only the environment but the communities they surround as well.

Hannah's response indicates depth of critical understanding of the intersections between humans and ecological systems. Though she acknowledges her impact on local communities and ecology, she notes the relativity of this impact, as she describes

feeling “like we’re fed into these kinds of greenwashed lies, like what we should be doing [personally] just to help the planet when there’s so much going on behind the curtain. That’s a way bigger issue going on.” Hannah demonstrates an understanding of the relative impact of any personal action she could take in relation to the inaction of large-scale corporations. She further commented that this realization “really changed my lens of what’s really important.” Her understanding of the enmeshment of human and ecological systems has led to her supporting “frontline movements, pipeline protests and different old growth stuff,” as, though she realizes the importance of “trying to be the best you can in everyday life,” she understands that there are “way bigger factors” to the environmental movement.

Mike expressed a similar understanding of the impact of human systems on the environmental crisis. He noted:

sustainability to me means that whatever you’re doing can go on indefinitely. And I see very little in the world today of what I would consider to be sustainable ... our system that the world operates on, a capitalist monetary system, is all based on growth, and it’s completely unsustainable ... sustainability to me would be stop the growth. It can’t grow indefinitely.

Both Hannah and Mike describe the impact of human-generated social and political systems on the environment crisis.

Curtis also espoused this understanding, as he noted the inequity of focusing on individual action. He described the need to be “fairly well off financially” to take most individual actions, as:

you can do the diet thing [reducing meat consumption] and you can do the travel thing [less air travel], but once you start getting into electric cars and different ways to build and stuff like that, they're definitely for the people with deeper pockets.

While he believes in the potential of individual action, Curtis recognizes the inequities that accompany a focus on individual action alone, as well as the relative lack of impact of individual action on a large scale. Instead, he asserted the importance of systemic change, which he described as, "we need corporations and governments, we need to get off the fossil fuels and stop subsidizing them."

Similarly, Ben described realizing that "this whole personal carbon footprint thing just doesn't matter. Doesn't mean we shouldn't do anything, but certainly means that it's not going to make a difference." As a result of his learning, he realized that "we need government policy changes. For the big corporations, we need regulation. For the big governments, we need regulation and treaties and agreements," which led to him becoming "a political guy." Ben's understanding of the relative inefficacy of individual action in comparison to large-scale regulation exhibited a high degree of awareness of his role in the human-ecological system.

Cindy expressed an understanding that personal actions "are all great, but they really, at the end of the day, are a drop in the bucket when we're looking at the emissions for our city, state, and country." Five of the seven athletes indicated that their understanding of human systems and relative personal versus political, corporate, or industry impact on environmental issues has informed their activist perspective. This understanding reinforces notions of sustainability put forth by Lugg (2007) and Parkin et

al. (2004), both of whom asserted the importance of an intersectional framework for sustainability that attends to the environmental, social, and economic domains of modern life.

Athlete stories indicate that they perceived that environmental and climate learning, or learning to become environmentally sustainable or responsible, was made possible by the external influence of formal education and/or family, mentor, or peer/athlete influence. These external influences on *athlete* environmental learning appear to be an addition to established literature on this topic, as the importance of these factors did not appear in the literature reviewed for this study. This learning led athletes to understand the impact of human systems on the environment, as well as the intersections between the two, especially as they relate to human social, economic, and political (in)action. This perspective shaped the way these athletes approach climate activism, as many athletes described learning about the relative inefficacy of individual climate action, in comparison to collective or political action, which fundamentally influenced the way they engaged with activism. Though athletes perceived that not all mechanisms for learning were directly connected to embodied experience in nature, athlete responses assert their perspective of the importance of their prior connection to nature via sport in both enabling their learning and motivating them to take meaningful climate action.

Action: Activism

Athlete stories indicate that, in addition to the importance of prior environmental learning, several factors contributed to their views on and engagement with climate activism. Athlete narratives suggest that sport-mediated time in nature, a connection to

nature, and engagement in outdoor sport were mechanisms through which they were motivated to become involved in climate action and activism. The expression of this involvement differed by athlete, as participants engaged in some of, or all of, individual efforts to reduce or mitigate their carbon footprint, individual action directed at influencing corporations or governments, collective and political action, and/or using their position as professional athletes to influence others to take environmentally responsible action. Importantly, six of the seven athletes interviewed for this study noted that they felt that they would not have become climate activists without first being outdoor athletes, as their connection to, and length of time spent in nature as a result of their sport fundamentally shaped their awareness and understanding of the need for climate action.

Athlete responses indicated the importance of time outside and connection to nature to informing activism. Hannah noted:

Climbing has really changed my perspective because you connect so much with the natural world. And it gives you so much in return that not doing anything is so hard. It's so heartbreaking, going out to the mountains and seeing this, like the snowpack recede.

For Hannah:

A connection with nature, and [understanding] how much that it can give [you] ... is the number one most important thing, getting people outside, getting kids involved in gardens, whatever. People are not going to want to save something they don't know about.

Similarly, Ben commented that “a lot of people say like the best way to care about a place is to experience it. I do think that’s true.” Cindy shared this perspective, as she noted:

when you feel that joy and nature and that happiness that can come from those experiences [in nature] ... for a lot of people it can lead to them becoming great activists to protect that ... it’s hard to care about something you don’t love.

All three indicated the importance of both time outside and connection to nature in informing and influencing their climate activism. The stated importance of these experiences reinforces arguments from Brymer et al., (2009), Mihala (2019) and Maltarich (2020), which suggest that, for some athletes, connection to nature is a necessity precondition to motivate them towards climate action and activism.

Athlete responses further suggest the importance of sport in informing their environmental activism. When asked if they connect their involvement in outdoor sport with climate consciousness and activism, or if it might work the other way around (asked, for example, ‘Do you think your connection to nature led you to becoming an outdoor athlete, and would the connection to nature have led you to ecological consciousness and climate activism even if you hadn’t become an outdoor athlete?’), athlete responses overwhelmingly supported the perspective that involvement in outdoor sport was the mechanism through which they became climate activists. All athletes, apart from Allison, indicated that they felt that they would not have become a climate activist without first being an outdoor athlete, as participation in sport facilitated their connection to nature and enhanced their awareness of ecological issues.

When I asked Curtis if he felt he would have become a climate activist without first being a high-level outdoor athlete, he stated that his “initial reaction to that would be no, I don’t. It’s so in your face [as an outdoor athlete].” Curtis perceived that his involvement in outdoor sport has enabled him to experience climate change and environmental issues in a tangible way, which has impacted his understanding of the need for meaningful action. Todd also noted the importance of these lived experiences with climate change, as his response to my question was:

No. The bottom line is that climbing immersed me in nature, and it made me more aware of nature and the importance of it So climbing has definitely had an impact on my awareness with nature. And that’s definitely brought me closer to being an activist, for sure.

Similarly, Cindy commented, “I definitely think that I’m much more vocal and committed as an activist because of my connection to nature as an athlete,” and “I don’t think I could do my activism without the time of joy and connection to nature and time as an athlete.”

All seven athletes note time in nature through sport as foundational to their conceptualization of the environment, and thus the importance of its protection. The stated importance of time in nature to athlete understanding of the need for environmental protection highlights a possible connection between the outdoor athlete experience and findings from Nicol (2014), which assert that nature-based experiences are essential to becoming nature-attentive, whereby individuals recognize the inherent value of nature, and thus the need for its conservation. Mike stated that his experience as a skier is “important,” as he feels:

the connection that skiing has given me to nature has informed who I am and why I speak for these things ... because I think there's a lot of things that I pay attention to in the news or whatever, that I'm into, or agree with. But this one's more than that. To me, it's like personal, it's something that is visceral, I can touch it, and I can feel it, and I can see it happening. And it makes me that much more passionate to dig in on it.

Mike's connection to nature through skiing has fundamentally informed not only his ecological consciousness, but also his activism, as this connection motivates him to protect the spaces and experiences he is passionate about.

Hannah repeated this view, as she explained:

Yes, climbing probably did inform how I see the environment and environmental issues because I've changed my lifestyle; climbing caused me to change my lifestyle in a way that I wanted to be in outdoor spaces, I wanted to be in the forest and the trees, in the mountains. Whereas before I probably would have followed more of like a career-based education, where now I see the importance of nature in my life in pursuing that kind of a lifestyle. In that way that it has become so much of a bigger part of my life. If you're outdoors every single day, you can't deny how important these things are.

Ben reinforced this idea, as he stated, "I do think that like skiing or running, biking, climbing have led me to believe or to care more about the planet." He noted:

I don't think I would care about it the same way if I wasn't doing these outdoor activities all the time. I could see like an alternative life ... just like doing city stuff all the time and just not really caring [about the environment].

Ben's insistence on the importance of sport to his activism supports the idea that involvement in outdoor sport can motivate and increase engagement in climate activism. Ben's assertion of the importance of his sport to his environmental activism add nuance to Schweizer et al. (2013), who found that place attachment fostered a sense of personal responsibility for the environment, which enables the individual to better understand the effects of climate change on a specific locale. Ben's experiences suggest that this notion may be applicable to an athlete population who have a breadth of experiences in a multitude of outdoor environments, which nevertheless enable them to develop a deep attachment to the outdoor spaces they frequent.

Allison was an outlier. She said: "if I had seen an avenue for getting involved, I would have been able to kind of find that way to be a climate activist before or without necessarily being an outdoor athlete," as "I was interested in climate change and learning about it and doing something about it when I was much younger, before I was anywhere close to being a professional athlete. I just didn't really know how to get involved."

While Allison felt that she could have become an activist without first being an athlete, she noted that:

climbing has made me or allowed me to experience so many amazing natural places that I want to help protect ... climbing allowed me to experience these places. And that makes me want even more to be a climate advocate, activist.

Though she felt that her involvement with climate activism was inevitable, her experiences climbing nonetheless fundamentally influenced her mechanism of climate activism, as she joined the activist group POW as an athlete ambassador. Moreover,

Allison's response suggests that her experiences climbing have provided motivation for her activism, as she is driven to protect the wild and natural spaces in which she climbs, which aligns with findings from both Siegner and Stapert (2020) and Schweizer et al. (2013), who assert the importance of place and place-attachment for facilitating engagement in climate action.

All athlete responses indicate that they perceive involvement in sport as an important mechanism for their engagement in climate activism, as their experiences as outdoor athletes provide opportunities for them to develop a connection to nature, awareness of ecological issues, and environmental learning. These factors led to athletes' altering their daily lives and behaviours to better align with environmentally responsible action, including, but not limited to, reducing meat consumption, converting home energy to solar, driving an electric vehicle, and offsetting travel, which aligns with Brymer et al. (2009), who found that engagement in extreme sport facilitated pro-environmental personal action.

Six of seven athletes in the study overwhelmingly supported collective action over individual change; however, all took steps to reduce their personal impact on the environment. Curtis, the lone athlete who stated his preference for individual change, noted:

I find that there's a lot of people that are advocating and lobbying for governments and corporations to change, but I think that unfortunately, we're still at the level where we need individuals to change so as we can impact the corporations and governments.

He suggested the potential power of “voting with your dollar,” and expressed his belief that “all of the sudden it’s becoming more economic to be green. It’s like people are using their dollars to go out of their way to support a company that has green technology.” To align with his views on individual change, Curtis changed his “diet and then travelling I just started saying no to airplanes as much as I could ... And then the next big thing was my truck ... it’s the perfect vehicle to convert to veggie oil.”

Though Curtis’s primary mode of action differed from the other athletes, his understanding of environmental issues led to changes in his behaviour that better aligned with his beliefs about climate action and his chosen method of activism: individual change. While his conviction in the power of individual change differed from the others, all agreed that individual action was important and took steps to mitigate their impact in their daily lives.

Todd noted that his individual efforts ranged from “offsetting my carbon,” to “[going] to reuse shops and [trying] not to use my car if I can get my bike.” Cindy noted that she “[does] the small things, like we have an EV ... and we have solar, we installed rooftop solar on our house ... and we try to eat local and eat organic and eat food with a lower footprint.” Similarly, Hannah stated that she carries reusable utensils with her and buys carbon offsets when she travels. Mike expressed similar personal efforts in “trying to reduce [air travel],” as well as “trying to be a vegetarian ... an environmental vegetarian.” Moreover, Mike noted, “even though we’re on hydro power here, our house is fully electric. So, there’s no gas or anything. But I’m still trying to optimize, like, how can I reduce energy production.”

These athletes' understanding of ecological issues led to personal action taken with the aim of reducing their individual carbon footprint to help protect the spaces their sport relies upon. Though athletes note their individual efforts, most athletes stated their support and preference for collective, and often political, action, as they found this form of activism to be more effective, which aligns with findings from both Maltarich (2020) and Mihala (2019) that suggest that outdoor athletes may prefer collective action as they feel it has the potential for more large-scale impact.

Athlete stories indicated that the complexity of information associated with environmental learning impacted their approach to climate action and activism, as they sought opportunities for impactful involvement. As athlete stories of their learning centred heavily on the importance of large-scale, governmental action, the majority of athletes aligned their mode of action to reflect this understanding and sought opportunities to become involved in collective action. Mike described this approach, as he noted, "I am trying to optimize my personal carbon footprint. However, I'm not naive enough to think that this is going to solve climate change." Because of this understanding, Mike joined the activist group Protect Our Winters, as he believes that "we only have so much power as individuals, but when we come together as a group, we can multiply that power by 100-fold." He asserted his belief that the most important thing one can do is:

join a group, because then you can help. You don't have to feel that this weight is on you, you can share with other people, and you become much more effective, because 50 people working together are far more effective than 500 people working as individuals.

Hannah echoed this sentiment, as she noted the importance of

having a connection [to nature], that education, and then also the community part so that people can fall back and have friends or people around them that are experiencing the same emotions and fears and working through that together in a small way. Because we're obviously not one person; not to be a pessimist, but realistically one person is not going to solve this thing.

Both Mike and Hannah's perspectives on the importance of collective action exhibit the significance of their prior learning on their activism, as both note the influence of their environmental learning on their understanding of, and method of involvement with, effective climate action and activism.

Similarly, Allison shared that prior to learning about climate change and environmental activism, she thought "climate activism was making a cardboard sign and going to march in the street ... but it didn't seem like it was doing anything to me." After talking with a particularly influential athlete peer, Allison became

involved with POW Canada ... as an athlete ambassador ... spreading awareness through my channels about the different campaigns Sharing and trying to encourage people to write letters. Again, try to get involved, talk to their MPs, tell them they're not happy with this.

Ben noted that he chooses "to volunteer with organizations versus do it all on [his own] ... because I think the orgs can throw their weight around a little bit more and make a pretty big difference." While the mode of activism differed amongst athletes, all athletes were motivated to become activists, or to increase their activism, as a result of their environmental learning and connection to nature. Moreover, environmental learning

foundationally impacted the mode of activism for the majority of athletes in the study, as most cited the increased efficacy of collective, political, or social activism, and relative inconsequence of individual change alone. This finding adds nuance to Maltarich (2020) and Mihala (2019), who both suggested that athletes appear to prefer collective action, citing its potential for larger-scale impact. However, the importance of prior environmental learning on athlete preference for collective action appears to be an addition to the established literature.

Athletes indicated that through their work in organizations and activist groups, they frequently engaged in social and political activism, often by using their status to influence others towards supporting environmentally responsible action. Mike noted that his involvement with POW began,

as just me being an ambassador so I would share the messaging through my social media platforms and go and speak [I've] done a bunch of speaking at schools. I've probably spoken to over 10,000 students about climate change.

He directly ties this activism to his experience as a professional skier, as he feels skiing is “where I have the biggest box to stand on; I guess it’s given me a platform to speak from. And so I’m just trying to use it, use it as much as I can to do something positive.” Moreover, he voiced that he “became way more political over the last few years because I’ve always avoided politics like crazy, but now I realize we need to pull every lever we have.”

Similarly, Curtis noted, “I have a voice because of skiing or a platform. Like a social media platform, a name.” He noted that, in part, his conviction about individual change stems from the potential for peer influence, as he believes:

when people see us making changes, like I see friends around me making small changes too, so I think that that has that snowball effect, and are they going to save the world? I don't know, you never know. That snowball effect ... you affect 10 people, and they affect five people each and they affect two more people, and all of a sudden your spider web gets pretty wide pretty quick.

His beliefs in individual action notwithstanding, Curtis nonetheless voiced, "I think that we just need to really start making changes as individuals and holding our government accountable." While Curtis places no faith in governments and corporations, he nevertheless understands the importance of government action and accountability.

Allison also noted the importance of peer influence and commented that while she prefers speaking with people in person because she "finds that a lot more powerful," that "people will listen a lot more in person than if you just have something on your social media," she understands that "on your social media you can reach a lot more people." Moreover, she reiterated the importance of political activism, as she stated, "I hope that I have made a difference in helping write letters to my MLA or MP ... Minister of the Environment, Minister of Natural Resources, Prime Minister, to help maybe push certain environmental policies to strengthen them or reject them." She voiced that this action comes from her belief that "it still takes people talking directly to policymakers, to lawmakers, people who actually have influence in the government to be able to create change. I think it still takes those people to create real change."

Todd mentioned that climate activism through social influence:

made total sense to me, because I've got the ability to be able to bring awareness to other people ... and I really want to pass it on to my son and the younger generation, globally, and try to make as much difference as I can really.

This desire to effect change through influence was predominately social media based, as these individuals' positions as elite outdoor athletes enabled them to grow large followings on various social channels. However, Ben noted that his efforts in interpersonal environmental influence began when "I started a recycling program at my elementary school, and I started a free bike rental program at my university."

As he now has a platform, he stated his desire to "use the megaphone that I have to hopefully inspire some of the change that we need."

Further, Ben described his experience with:

a pretty big reckoning to realize that [individual action] just doesn't matter; like, I'm not a politically minded person. I don't like politics at all. But I have been taught now through people who are smarter than I am, who I respect, and who I listen to that that is where the, if we truly want to see some progress here, that's where the actions are actually made on a more systemic, systematic level. And if that means me going to Washington DC every year, unfortunately, that's what it's going to be. I'm going to have to wear a suit and talk to these super bland politician old white guys about things that they just don't care about. But I'm going to have to do it because that's where the dent is going to be made.

Similarly, Cindy commented, "I would say political activism is my main form of activism," as she said:

I really prioritize ... voting, getting other people to vote, electing climate champions. I'm going to city, state, and federal government medians to advocate for renewable energy goals, and decarbonizing our economy so that everybody, whether they can afford rooftop solar or not, can have access to clean, renewable energy.

While the mode of athlete activism has manifested in diverse ways, all athlete participants understand the importance of using their influence to persuade others socially and politically towards responsible climate action, which confirms findings from Maltarich (2020) and Mihala (2019), both of whom noted the influence of professional outdoor athletes on their audiences and the efforts of these athletes to use their platforms to help others become more environmentally responsible. It also aligns with Anderson's (2011) notion of the influence of athlete celebrity environmental advocacy.

Participant narratives indicate that the majority of athletes interviewed shared the perspective that experience as outdoor athletes was a necessary precondition for their involvement in climate activism. Athlete activism primarily manifested in larger-scale group social and political activism, as athletes described their understanding of the increased efficacy of this form of activism; all athletes additionally took steps to reduce their personal environmental impact. Further, all athletes espoused their belief in the need for governmental action through policy and legislation, as they indicated the ineffectiveness of individual carbon reducing actions when compared to the emissions of corporations. Though one athlete indicated his preference for individual action, citing his lack of faith in corporations or the government to become truly environmentally responsible without pressure on their economic bottom line, he, like all athletes

interviewed, espoused a belief in the need for government and corporations to change their behaviour in order to bring about lasting, impactful climate action.

Chapter Five: Conclusions

This study documents the perspectives of high-level outdoor athletes on the influence of their involvement in outdoor sport on the development of their ecological consciousness, ecological literacy, a sense of responsibility to nature, and climate activism, as well as the possible stages through which these athletes developed these attributes. Athlete narratives demonstrate that these athletes perceive experience in nature through sport to facilitate an emotional connection to the natural world, which in turn enables ecological consciousness, as they understand the interrelations of human society and the natural world and develop pro-environmental thought and behaviour. Further, athlete perspectives indicate that this time in nature facilitates observation of ecological issues and climatic events, which fosters ecological literacy, as they develop systems thinking that enables an understanding of ecological issues and their intersections with sociocultural factors. Athlete responses suggest that environmental learning was heavily centred on learning to become more environmentally sustainable or responsible. While the mechanisms for learning were not directly tied to experience in outdoor sport, athletes asserted the significance of their involvement in outdoor sport in catalysing their environmental learning, as outdoor sport provided the connection via which they developed a sense of responsibility for nature and became concerned about environmental issues and climate change.

Athlete perspectives indicate that while several factors contribute to their involvement in climate activism, their involvement in outdoor sport was the most influential factor, as all but one athlete stated their conviction that they would not have become engaged in climate activism without first being engaged as an outdoor athlete.

Moreover, athlete perspectives indicate that this experience as an outdoor athlete, a prior connection to nature from sport, and the length of time spent outdoors as a result of their sport were the mechanisms through which athletes became climate activists. While the mechanisms for engagement were fairly consistent across athletes interviewed, their mode of activism varied, as athletes were engaged in a mix of individual, collective, social, and political action.

Athlete responses suggest that each stage of learning may arise from a combination of several mechanisms, though engagement with each individual mechanism does not appear to be necessary to the overall process. For them, ecological consciousness can be formed through adventure, connection to nature, connection with others, enjoyment outdoors, impactful first experiences, being in remote / hard to access areas, and mental and physical wellbeing from pursuing outdoor sport. While it may not be possible or even desirable for students in formal educational settings to experience remote and hard to access areas, others such as connection to nature, connection with others, enjoyment outdoors, and impactful first experiences, can be incorporated into an educational curriculum.

The athletes' ecological literacy may benefit from the prior development of ecological consciousness and can be broken down into personal experience with climate change, observation of ecological issues, a career as a professional outdoor athlete, and the increased risk to personal safety and job security posed by climate change. Athlete environmental learning arises through education, influence from family, mentors, or peers, a sense of responsibility to and for the natural world, and an understanding of human-ecological systems and the relative impact of various forms of

climate action (i.e., individual vs. collective vs. governmental, corporate, industry). Lastly, for this population, the process of action occurs through sport-mediated time in nature and involvement in outdoor sport, which results in individual carbon reducing actions, individual and collective action, athlete influence on others, and political activism. Moreover, athlete responses suggest a shared perspective on the importance of their connection to nature, which, for them, has developed from time in the outdoors through sport, to each stage, as these spaces inspire awe, foster perspective on athletes' place in the global ecosystem, and enable athletes to observe tangible effects of the climate crisis that may be inaccessible to many individuals.

This study suggests possible stages through which athletes develop ecological consciousness, ecological literacy, responsibility for nature, and climate activist behaviours. While the actions of this population require highly specialized skills and gear, I speculate that the findings may apply to a general public or school-based population, albeit in a modified different manner.

First, these findings suggest the importance of engagement with nature, as athlete responses indicate that this is an important factor in influencing their relationship to the natural world. In schools, this may be accomplished through structured or unstructured outdoor time, which may include outdoor/experiential education, an outdoor classroom, nature-based learning, or place-based learning. While the stimuli of more extreme outdoor sport like skiing or rock climbing are not realistic in most school environments, mechanisms for engagement with nature may be found in school environments. Student engagement with, and connection to, nature could be increased by engaging students in nature-based pedagogies that provide learning opportunities

through personally meaningful or impactful activities around the school grounds.

Encouraging the development of a sense of awe and wonder for nature may also be influential in informing pro-environmental and eco-centric values. My findings suggest that engaging students in these types of connective activities prior to teaching about climate change or environmental issues may increase student engagement with later learning and increase the likelihood of students engaging in climate action.

Second, while athlete narratives indicate the role of formal education in providing environmental learning, their assertions of the significance of their prior connection to nature in motivating this learning suggest the possible importance of teaching public or school-based environmental and climate change education through a lens of connection to nature, which aligns with current pedagogies of environmental and climate change education. This may most easily be accomplished through place-based education, as individuals can develop a deep connection to their local environment. While athlete experiences cannot be likened to place-based education, some athletes described a connection to place or places they frequent through their sport (e.g., Mike and the Horstman Glacier) as being important to their learning. This strengthens the case for facilitating experiences with nature and connections to place for the way they may help ground environmental and climate learning in concrete examples from direct personal experience, thus encouraging students to engage more deeply in the material.

Lastly, these findings suggest the potential of outdoor sport in fostering meaningful experiences that connect individuals with the natural world, though these experiences will likely look different from those described by the athletes in this study due to the complexity and scale of risk involved in some outdoor sport. However,

engagement in lower-risk outdoor sport, such as cross-country or downhill skiing, trail running, paddle sports, mountain biking, or hiking may provide similar connective and observational experiences to those described in this study, especially if facilitated by knowledgeable mentors.

The perspectives documented in this study provide a tentative process through which ecological consciousness, ecological literacy, sustainable or responsible behaviour, and climate activism develop based on a limited athlete sample population, which support the research questions outlined at the beginning of this study. However, as this study is exploratory in nature and employs a limited sample population, further research with a larger sample size, across a larger sample of outdoor sports is required to increase trustworthiness of the data and increase confidence in its applicability to more high-level outdoor athlete climate activists. Future research could additionally explore *if* and *how* this process may develop through outdoor sport in participants who have not previously engaged in outdoor sport or identify as outdoor athletes. Further, future research might seek to understand how this process may emerge in a formalized education environment to understand how participation in outdoor sport may catalyze environmental care and climate activism in a school-based setting.

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Appendix A

Interview Guide

1. What sport do you engage with? What level do you compete/performance at? How long have you been engaged in this sport?
2. Why do you like X sport? What does participation in it mean to you?
3. Tell me about a time you experienced a feeling of connection with the environment.
4. What motivated you to learn more about the environment and sustainability?
5. How do you describe your connection/relationship to the environment?
6. Tell me about the evolution of your relationship to nature.
7. Tell me, in some detail, about the kinds of things that have led you to learn more about environmental issues.
8. Tell me about a time when something you learned had an impact on the way you approached sustainability.
9. How has participation in your chosen sport impacted the way you engage with nature?
10. How has your connection to the environment evolved since you began X sport?
11. What impacts do your daily actions have on the environment?
12. How do you define sustainability?
13. What kinds of things have you changed in your life as a result of your learning/connection to nature?
14. What kinds of things have you changed to account for this impact?
15. What types of climate activism are you involved with?

16. What motivated you to become involved in climate or environmental activism?
17. How has your sport informed your activism?
18. How has your relationship to nature informed your activism?
19. Some elite outdoor athletes connect their involvement in outdoor sport with climate consciousness and activism, but I wonder if it might work the other way around? Do you think your connection to nature led you to becoming an outdoor athlete, and would the connection to nature have led you to ecological consciousness and climate activism even if you hadn't become an outdoor athlete?
20. What do you think is most important to engaging others in climate activism? How would you suggest others become involved in climate activism or action?

Appendix B

Code Group	Code	Frequency
Experience	Adventure	4
	Connection to Nature	30
	Connection with Others	3
	Enjoyment Outdoors	5
	First Experience	6
	Remote, Hard to Access	9
	Well-Being	5
Observation	Increased Climactic Risk	3
	Job	8
	Observation	24
	Personal Experience with Climate Change	19
Learning	Education	10
	Family Influence	8
	Mentor Influence	3
	Peer/Athlete Influence	5
	Responsibility	14
	Understanding of Human Systems & Relative Impact	20
Action	Importance of Time Outside to Caring	5
	Importance, or lack thereof, of Sport to Activism	15
	Individual Carbon Reducing Actions	20
	Individual Action	5
	Collective Action	18
	Influence on Others	31
	Political Activism	18

Appendix C

Research Ethics Board Approval Letter



Research Ethics Board
t: (807) 343-8283
research@lakeheadu.ca

September 22, 2021

Principal Investigator: Dr. R. Paul Berger
Student: Julia Lawrence
Education
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1

Dear Dr. R. Paul Berger and Julia

Re: Romeo File No: 1468831

On behalf of the Research Ethics Board, I am pleased to grant ethical approval to your research project titled, "From Alpinism to Activism: An Exploration into The Development of Ecological Literacy, Ecological Consciousness, Sustainable Behaviours, and Climate Activism in Outdoor Athletes".

Ethics approval is valid until September 22, 2022. Please submit a Request for Renewal to the Office of Research Services via the Romeo Research Portal by August 22, 2022, if your research involving human participants will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Access the Romeo Research Portal by logging into myInfo at:

<https://erpwp.lakeheadu.ca/>

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Best wishes for a successful research project.
Sincerely,

A handwritten signature in black ink, appearing to read "C. Pousa", enclosed in a rectangular box.

Dr. Claudio Pousa
A/Chair, Research Ethics Board

/sa