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Antioch New England Graduate School

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ANTIOCH UNIVERSITY
NEW ENGLAND

Department of Environmental Studies
DISSERTATION COMMITTEE PAGE

The undersigned have examined the dissertation entitled: "The Power of a Profound Experience with Nature" presented by Becky N. Mathers, candidate for the degree of Doctor of Philosophy and hereby certify that it is accepted*

Committee Chair: Alesia Maltz, Ph.D.
Core Faculty, Antioch University New England
Director, Program in Interdisciplinary Studies

Committee Member: Jimmy Karlan, Ph.D.
Core Faculty, Antioch University New England

Committee Member: Louise Chawla, Ph.D.
Professor Emerita, University of Colorado Boulder

Defense Date: January 27, 2020
Date Approved by all committee members: TBD
Date Submitted to the Registrar's Office: TBD

*Signatures are on file with the Registrar's Office, Antioch University New England.

The Power of a Profound Experience with Nature

Becky N. Mathers

Antioch University New England

April 22, 2020

Advisor: Alesia Maltz, Ph.D.

Committee Member, Jimmy Karlan, Ed.D.

Committee Member, Louise Chawla, Ph.D.

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They say it takes a village to raise a child and I believe this to be true for a dissertation as well. Over the past five-and-a-half years, I have birthed this dissertation from a sincere interest to a full-fledged research project. But I have not done it alone. I have many who helped me along the way. I offer thanks to my dissertation committee: Alesia Maltz, Jimmy Karlan, and Louise Chawla. I am forever grateful for your support, guidance, wisdom, and patience. I have learned so much from each of you. I especially want to thank Alesia for being my advisor and committee chair. You consistently challenged me to think deeper and as a result, I have grown tremendously as a researcher and a writer. To the many scholars who have mentored me over the course of the journey: Eric Brymer, Dan Caston, Mindy Merrick, and Jeffrey Perrin. Thank you taking the time share with me about your own dissertation process, answer any questions I had, and offer your support. You each taught me what it means to be a mentor. Eric and Dan, I would like to offer you an additional thanks for sharing your wisdom and experience with qualitative data analysis with me. You were instrumental in my growth as a researcher and scholar. I would also like to thank my cohort of doctoral students at Antioch University New England for your encouragement and companionship along this journey. To my twenty-one study participants, thank you for sharing your profound experiences with me. It was an honor to hear your stories and learn how much the experience meant to you and how it changed you. To Micha Rahder, you came into my life at a time when I needed the external motivation to keep going. Thank you for your consistent positive support and for your amazing editing skills.

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Abstract

This dissertation explores the long-term influences of a profound experience with nature—an experience that shifts an individual's view of or relationship with the natural world. Significant life experience research investigates the associations between formative experiences in nature and resulting environmental concern and action, including both singular events and repeated experiences. In the case of a single, memorable experience with nature, little is known about the long-term effects of these experiences or how individuals use the associated memories in their lives. This research investigates these questions through semi-structured interviews with twenty-one adults who had a profound experience with nature, exploring how they make sense of their experience, the meaning they attribute to it, and the role it served in their lives. Thematic analysis was used to identify, analyze, and interpret the interview data. The findings demonstrate that a single profound experience with nature can have long lasting and significant effects on an individual. The associated memories serve self, social, and directive functions, including strengthening a sense of self, redefining relationships with people and nature as a whole, and promoting environmental decisions and behaviors. Findings also reveal a potential fourth use of memory: developing and appreciating relationships with other-than-humans. Understanding these long-term influences and uses of a profound experience with nature have implications for environmental educators, ecopsychologists, and memory scholars.

Keywords: profound nature experiences, significant life experiences, memory function

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Chapter 1: Introduction

Many times in my life I have found myself in awe of the natural world—captivated by the beauty of nature, enamored by the grandness of my surroundings, and deeply connected to something bigger than myself. My deep and intimate relationship with the natural world stemmed from a moment in the rain almost 20 years ago. I remember the moment like it was yesterday. While on a short walk, rain began to fall and, instinctively, I stopped walking and stood motionless. As I watched the raindrops splatter around me, I felt as if time stood still. Immense joy and love flooded my body, resulting in an inner peace I had never felt previously and have only felt a few times since. My body felt simultaneously calm and alive. I was awakened to the beauty of the natural world and the interconnections of all living things.

The memory of my moment in the rain is present within me, and I have told the story countless times. By sharing my story, I have learned that others have had similar experiences. It was this realization that led to my yearning to understand this phenomenon, especially its lasting effects. Before beginning this dissertation research, I turned to popular environmental literature to learn from some of the great environmentalists and conservationists who wrote about their memory of a profound experience with nature. The lasting effects and influences of these experiences are evident in their writing.

Aldo Leopold, a naturalist, forester, and the "father of ecological science," recalls an encounter looking into the eyes of a dying wolf in his 1949 book, *A Sand County Almanac, and Sketches Here and There*. He writes,

> We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes—something known only to her and to the mountain. I was young then, and full of trigger-

> itch; I thought that because fewer wolves meant more deer, that no wolves would mean hunters' paradise. But after seeing the fierce green fire die, I sensed that neither the wolf nor the mountain agreed with such a view. (pp. 129–130)

The full implications of Leopold's experience were not revealed until many years later. In the fall of 1936, Leopold and a friend spent two weeks in the Sierra Madre Occidental in northern Mexico where he first encountered wilderness untouched by humans. He observed a healthy ecosystem with flora and fauna in balance and game and predator populations thriving (Leopold, 1937). The time in the Sierra Madre solidified his changing view of wildlife management that had started years earlier when he looked into the eyes of the dying wolf. Leopold's profound experience with nature ultimately transformed his understanding of healthy ecosystems, his career as an educator, and how he managed his family farm.

Another example comes from writer, naturalist, and activist Janisse Ray. In her book, *Ecology of a Cracker Childhood*, Ray (1999) shares her life story of growing up in South Georgia. She writes fondly of her fifth and sixth-grade science teacher, Lucia Godfrey, who nurtured Ray's love of the natural world. Ray recalls one experience on the playground when Mrs. Godfrey introduced her to beautiful pine trees:

> Out of all her science lessons, that one on the playground, not only did I never forget but remember as vibrantly as if it happened last week. I learned that nature wouldn't ridicule you, would let you play. Oblivious, it went about its business without you, but it was there when you needed some gift, a bit of beauty: it would be waiting for you. (p. 214)

Here, Ray's respect for, connection with, and love of nature are evident in her writing as she vividly recalls a specific moment that forever deepened her appreciation for the natural world.

In her book *H is for Hawk*, Helen Macdonald (2014) shares her story of heartbreak over the unexpected death of her father. She describes how she felt more hawk than human while hunting with her goshawk, Mabel. Macdonald (2014) writes, "Hunting with the hawk took me to the very edge of being a human. Then it took me past that place to somewhere I wasn't human at all" (p. 195). Recounting her internal struggles with taking a life when hawking, Macdonald (2014) writes:

> But the regret wasn't that I had killed an animal. It was regret *for* the animal. I felt sorry for it. Not because I felt I was better than the animals. It wasn't a patronizing sorrow. It was the sorrow of all deaths… And a sharp, wordless comprehension of my own mortality. *Yes I will die.* (p. 197)

Macdonald's (2014) experience taught her not only about death, but also about life:

> Of all the lessons I've learned in my months with Mabel this is the greatest of all: that there is a world of things out there: rocks and trees and stones and grass and all the things that crawl and run and fly. They are all things in themselves, but we make them sensible to us by giving them meanings that shore up our own views of the world. In my time with Mabel I've learned how you feel more human once you have known, even in your imagination, what it is like to be not. (p. 275)

Through their medium, these environmental writers have demonstrated the sustaining effects of a meaningful and memorable experience with nature.

Understanding Profound Experiences with Nature

At this time in human history, it is important to understand how individuals come to value their relationship with the natural world. Significant Life Experience (SLE) research, grounded in the field of environmental education, is one area where scholars investigate how

time spent in nature contributes to the preparation of individuals who "take action for the environment" (Chawla & Derr, 2012, p. 527). This research has gathered and analyzed multiple experiences in nature: those that occur during informal play and exploration, environmental education programs, or wilderness programs, and both singular events and repeated experiences. Although scholars have recently begun to investigate a single, memorable experience with nature (Caston, 2014; Merrick, 2008), little is known about the long-term effects of these experiences or how individuals use the memories in their lives. SLE research would benefit from understanding how such a single event has the potential to encourage care, concern, and action for the planet.

This dissertation research addresses this issue, seeking to better understand how a singular, meaningful experience defines an individual's self-awareness of his or her relationship with nature, changes social relationships, and directs environmental decisions and behaviors. In this dissertation, I will refer to these experiences, which shift an individual's view of or relationship with the natural world, as *a profound experience with nature*. This term builds on others used to describe similar experiences by scholars of religion, psychology, philosophy, recreation, and environmental education. I chose to use a new umbrella term in order to encompass the variety of transformative nature experiences previously researched by others, while also leaving open the possibility of new forms of profound occurrences experienced by my study participants. A profound experience with nature and a profound experience will be used interchangeably in this dissertation.

This open definition encompasses both direct and indirect experiences with nature. In this study, direct experiences encompass activities occurring outdoors in a natural setting in which an individual is experiencing nature directly with their senses. Indirect experiences include those in which an individual is exposed to nature in an abstract way, such as indoors in a classroom,

through a film or book, or via other forms of media with an environmental theme. While direct experiences with nature are more often reflected in the literature, indirect experiences are also present and warrant further exploration. For example, Merrick (2008) documented three experiences she referred to as intellectual epiphanies; these were each a "non-place-based progression in which participants were exposed to new information (in these cases, text) that allowed them to adjust the way they viewed nature and their relationship with nature" (Merrick, 2008, p. 43). These indirect experiences led to changes in environmental perceptions and behaviors (Merrick, 2008). Similarly, SLE research documents how indirect experiences with nature shape environmental attitudes, values, and behaviors (Chawla, 1999; Gunderson, 1989; James, 1993; Palmer, 1993; Peters-Grant, 1986; Sward, 1996). This study is inclusive by allowing participants to reflect upon the memories of both direct and indirect experiences with nature. This decision is strengthened by the three participants who described indirect experiences with nature, yet also expressed the profound and lasting effects of their experiences.

The profound experiences recounted in this study are unique, personal, and become a memorable part of each participant's life experience. In other words, they are autobiographical memories (Kihlstrom, 2009; Kopelman & Kapur, 2001; Tulving, 2002). Historically, memory research focused on how memory worked rather than understanding its usefulness (Bluck & Alea, 2002; Bluck, 2009). In the late twentieth century, however, scholars began to delve into memory function research and have identified three functions of memory: self, social, and directive (Bluck & Alea, 2002; Kihlstrom, 2009; Pillemer, 1992). This broad area of research investigates how individuals use memories of past events in their lives.

My research introduces the memory function framework into SLE, considering how individuals use the memory of a profound experience with nature in their lives. No previous

study has used the memory function framework in such a way and my research aims to address this critical knowledge gap by revealing how a profound experience with nature influences people's lives, with special attention given to the three functions of memory. While grounded in the functions already defined by the memory function literature, my analysis remains open to discovering other possible ways in which people use their memories of a profound experience.

Purpose of Research

To explore how individuals make sense of their profound experience, the meaning they attribute to it, and the role it served in their lives, I interviewed twenty-one adults who had a profound experience with nature. Specifically, the purpose of my research is to explore the following questions:

1. How do individuals describe the influences of their profound experience with nature?
2. How have individuals used their memories of their profound experience with nature?
3. What functions do these memories serve?

My findings will contribute to SLE research by considering if and how a singular memorable experience can encourage environmental care and concern. The findings may also inform memory function scholars about how memories of a profound experience with nature can be used beyond the three established functions.

Structure of Dissertation

In chapter 2, I explore the literature concerning profound experiences, significant life experiences, and memory function. I begin by discussing phenomena researched in the disciplines of psychology, philosophy, and environmental education that have similar characteristics to a profound experience with nature. I consider how the various terms used to describe these experiences are defined, how they relate to and differ from each other, and why I

use a new umbrella term in this study. I provide an overview of SLE and posit my own research in this field. Next, I discuss memory, focusing specifically on autobiographical memories and the various functions that they serve. I close the chapter by bridging research on profound experiences, SLE, and memory function to address how each helped to inform my research.

Chapter 3 focuses on my research design. I discuss my data collection methods, including how I solicited and selected participants for the study, the interview protocol used, and how I determined data saturation. I describe the process of inductively analyzing the interview data using Braun and Clarke's (2006) thematic analysis method, combining this with deductive analysis to determine how my data fit into the memory function framework. I close chapter 3 by describing the validity of my research methods and ethical considerations.

In chapter 4, I offer the results of the study, beginning with brief summaries of each profound experience with nature recounted by participants. Next, I describe the impacts of these experiences as reported by participants. I identify four major themes that emerged from inductive analysis of the data, using segments from the interviews as illustration. I also present the data in the context of memory function to describe how participants have used the memory of their profound experiences with nature in their lives, and discuss other findings that emerged from my analysis.

In the last chapter, I situate my findings in the current literature, theory, and research. I organize this discussion in terms of the four major themes identified in Chapter 4, comparing these themes to the three functions of memory. Based on this discussion, I argue that a profound experience with nature can serve self, social, and directive functions, including strengthening a sense of self, redefining relationships with nature and others, promoting decisions and behaviors, and a potential fourth use of developing and appreciating relationships with other-than-humans. I

address the implications of this finding, as well as the limitations and biases I encountered during the course of my research. Finally, I offer suggestions for future research in this area in hopes of garnering a greater understanding of lasting effects of a profound experience with nature.

Chapter 2: Literature Review

To address my research questions, I conducted an extensive literature review to explore the intersection between profound experiences and memory function. Grounding my study in memory function offers new insights into how a profound experience can define an individual's self-awareness, encourage social relationships, and direct future decisions and behaviors, while also allowing me to remain open to new ways in which people use the memories.

This chapter contains four sections. First, I delve into the multidisciplinary literature on related experiences to situate my research within the broader field of profound experiences. Next, I ground my work within SLE research and the memory function literature, the avenues through which I explore profound experiences with nature. The final section describes how I integrate these three areas of literature into my research framework.

Profound Experiences Research

In my quest to understand the lasting influences of a profound experience with nature and how individuals use the memory of the experience in their lives, I conducted a multidisciplinary literature review. What I found is descriptions and characteristics of phenomena similar to those of a profound experience with nature.

An early account of a phenomenon with similar qualities to a profound experience was James's (1929) description of conversion. James described conversion as an experience in which an individual felt a sense of personal transformation and illumination, virtually a rite of passage, "from the child's small universe to the wider intellectual and spiritual life of maturity" (p. 196). James also wrote of mystical experiences, which he described as states of consciousness with characteristics of ineffability, noetic quality, transiency, and passivity. For an experience to be ineffable, it must be directly sensed, rather than imparted or transferred. The noetic quality refers

to the sense of enlightenment and significance felt by the individual, while transiency refers to the experience passing quickly. Finally, during a mystical experience, an individual feels as if an outside force acted upon them.

James's (1929) description of personal transformation during conversion and mystical experiences is similar to Miller and C'de Baca's (2001) description of quantum change, which is characterized by vividness, surprise, benevolence, and enduring change. While the authors did distinguish between two types of quantum change, insightful and mystical, both result in enduring personal transformation.

Related to personal growth and transformation, Maslow (1964) used the term peak experience to describe moments in which individuals reach their highest individual potential or self-actualization. Maslow sought to understand what triggers peak experiences, what happens during the moment itself, and the after effects, describing 25 aspects of peak experiences related to psychological growth, motivation, and values. Maslow's characteristics of seeing the universe as a unified whole and feelings of wonder, awe, reverence, humility, surrender, and even worship before the greatness of the experience are similar to James's (1929) descriptions of conversion and mystic experience. Likewise, the after effects of a peak experience include a new view of self, a desire for more peak experiences, openness to greater spontaneity, and a renewed belief in a purpose for living (Maslow, 1968).

Another form of personal transformation described in the literature is an epiphany (Jauregui, 2007; McDonald, 2008). Similar to the above terms, epiphanies are unexpected personal and enduring transformations. Individuals can experience a sense of transcendence during an epiphany, resulting in a transformed sense of self, often in the presence of new insights (Jauregui, 2007; McDonald, 2008).

While nature may trigger the experiences in the above studies, it is not an essential component as it is with a profound experience with nature. Other researchers have explored similar phenomena associated with the natural world to understand the triggers and after effects of such experiences (Brymer, Downey, & Gray, 2009; Caston, 2014; Cohen, Gruber, & Keltner, 2010; Davis, 2016; Keltner & Haidt, 2003; Merrick, 2008; Perrin et al., 2018; Williams & Harvey, 2001).

Transcendent experiences are one such experience that can be triggered by the natural world. A transcendent experience is "a moment of extreme happiness; a feeling of lightness and freedom; a sense of harmony with the whole world; and moments, which are totally absorbing and which feel important" (Williams & Harvey, 2001, p. 249). A study of people who live or work in or visit forests addressed the forms of transcendence that occur in this natural setting and the role of the physical environment in influencing these experiences (Williams & Harvey, 2001). The findings reveal two forms of transcendence in forests: diminutive and deep flow experiences. Diminutive experiences were less relaxing and involved fascination with a single compelling element of the environment. Deep flow experiences were more relaxing and associated with multiple foci rather than a single element of the environment. The physical environment of a forest ecosystem is significant in shaping transcendent experiences, yet further research needs to explore other natural settings and the after effects of such experiences. Similarities exist between diminutive experiences and deep flow experiences and a profound experience with nature, yet the studies of these two forms of transcendence have been limited to forest ecosystems. Readers will find profound experiences with nature occurring in terrestrial and aquatic ecosystems.

A recent study (Davis, 2016) empirically tested for a link between transcendent nature experiences and positive environmental engagement. An online survey first assessed whether and how nature-based transcendent experiences and associated qualities, such as awe, contribute to environmental behaviors based on personal values. Next, the effects of emotional responses to awe-inspiring nature videos on environmental behaviors after reading a climate change message were determined. The initial findings indicate that transcendent nature experiences, especially those with a quality of awe, can contribute to positive environmental behavior (Davis, 2016).

The link between awe and positive environmental behavior furthers the work of earlier studies of awe (Keltner & Haidt, 2003). Awe was found to consist of two central themes: perceived vastness and a need for accommodation. Vastness is defined as "anything that is experienced as being much larger than the self, or the self's ordinary level of experience or frame of reference," whereas, accommodation "involves a challenge to or negation of mental structures when they fail to make sense of an experience of something vast" (Keltner & Haidt, 2003, p. 304). Of significance to my study, Keltner and Haidt (2003) suggest that natural objects can elicit awe, and individuals who experience awe in nature feel a sense of diminished self, a letting go of preconceived notions, and the possibility of a higher power.

Both transcendence and awe (Davis, 2016; Keltner & Haidt, 2003) are limited because they only encompass positive moments, while some moments with the potential to change an individual's view of or relationship with the natural world can be negative (see Joseph's description of his witnessing the destruction of a baby bird nest in chapter 4). I wanted the participants in my study to express their own emotions related to their experience.

Two other highly emotional experiences—spiritual transformations and experiences of profound beauty—were the focus of Cohen et al.'s (2010) study. Analysis of written narratives

reveals several similarities with previous work, including a sense of awe, emphasis on "circumstances" rather than self, and a desire for understanding. However, distinctions also exist. Spiritual transformation included "greater uncertainty, obstacles, problems, and turmoil" and "more negative effects, such as guilt, pain, sadness, and worry" (Cohen et al., 2010, p. 134). Participants also gained an understanding of "self, the world, and a sense of purpose," resulting from a spiritual experience, but not from experiences of profound beauty (Cohen et al., 2010, p. 134). Similar to profound experiences with nature and related phenomena, both spiritual transformations and experiences of profound beauty have the potential to change an individual permanently.

In the field of outdoor recreation, Brymer et al. (2009) conducted a large hermeneutic phenomenological study on how extreme sports practiced in a natural setting act as a precursor to environmental sustainability. The researchers collected data from 15 extreme sports participants in the form of interviews, biographies, videos, papers, and journals. They determined that extreme sports participants feel connected to nature, which leads to a "desire to care for the natural world and contributes to more environmentally sustainable practices" (Brymer et al., 2009, p. 193). Similarly, a transformative experience with nature (Caston, 2014) was found to significantly alter a person's life and relationship with nature, leading to behaviors more in tune with the natural world and "processes in which one is immersed" (p. 108).

The studies on extreme sports practiced in natural settings and transformative experience with nature share a similar aftereffect to one found in the present study. While none of these studies intentionally sought a link between their phenomenon of interest and changes in environmental behaviors, participants in all three studies did recount positive changes toward the environment after their experience. A requirement of the Brymer et al.'s (2009) study was that

participants must have engaged in "independent sports where the most likely outcome of a mismanaged mistake or accident is death" (p. 194). While this focus on extreme sports participants is limited and does not apply to the participants in my study, the findings support a change in the human-environment relationship similar to those of this study. Similarly, a transformative experience with nature must "significantly influence a person's self-perception in relation to the environment" (Caston, 2014, p. 3). This definition limits those potential participants who may not recognize the significance of their experience on their relationship with the natural world. It may be during the interview when they recall the memory and how it affected them that they fully grasp how the experience changed them.

With a specific focus on wild animal encounters, Perrin et al. (2018) sought to explore the emotional responses and potential lasting impacts of such an encounter. Study participants most often reported initial feelings of fear after a wild animal encounter. Yet interestingly, respondents also reported feeling a sense of interconnectedness and greater respect for the natural world after such an experience. The study of wild animal encounters (Perrin et al., 2018) is exclusive to those experiences which involve human-animal interactions, yet the findings support those of this study. In both studies, participants do report feeling a connection to and greater respect for the natural world after their experience.

Further supporting the significance of the natural world in shaping profound experiences is work on environmental epiphanies (Merrick, 2008). An environmental epiphany, an experience in which one's relationship "to nature shifts in a meaningful way" (Merrick, 2008, p. 23), has characteristics similar to those described in related phenomena. An environmental epiphany can occur over a range of ages, at all times of day, and in all seasons. It is ineffable, a fleeting moment or sense of time standing still, and is sudden and surprising. Individuals who

experienced an environmental epiphany report subsequent changes in environmental values, attitudes, or behaviors.

Five distinct types of environmental epiphanies were described in the literature: aesthetic, intellectual, realization, awakening, and connectedness (Merrick, 2008). Aesthetic epiphanies tend to be associated with a place. Common with this type of environmental epiphany is the presence of an object (or objects) of interest, and these frequently are in the presence of significant others or groups. Intellectual epiphanies are sudden, often evoking "aha" or "eureka" feelings, and are associated with an object such as part of a text or other written material. During a realization epiphany, individuals become aware of a previously known but not fully grasped concept, often while engaged in unusual activities or in novel places. Awakening epiphanies are described as an individual experiencing a "new awakening or vividness" as if he or she "had been asleep before the experience," and tend to be life changing (Merrick, 2008, p. 57). Finally, a connectedness epiphany is one in which an individual feels connected to nature or something more significant than oneself, and entails "mystical and spiritual qualities" (Merrick, 2008, p. 59).

Much overlap exists between an environmental epiphany and a profound experience with nature. Merrick (2008) did not define what she meant by "meaningful manner," and I did not want participants to feel excluded by the term "meaningful." Likewise, participants may perceive the natural world differently after a profound experience but may not recognize outward changes in their interactions with nature. Merrick's (2008) definition of an environmental epiphany may encapsulate both the view of and relationship with the natural world, yet because it is not explicitly stated, it cannot be assumed that this is the case.

Finally, in the field of environmental education, scholars have sought to understand the formative experiences occurring in nature over individuals' lifetimes that influence them to commit to care and concern for the environment (Chawla, 1998a; Chawla, 1998b; Chawla, 1999; Palmer & Suggate, 1996; Palmer, Suggate, Robottom, & Hart, 1999; Tanner, 1980). SLE research has gathered and analyzed multiple experiences in nature, both singular events and repeated experiences. As explored in greater depth in the following section, I situate my research in the field of SLE, adding a new emphasis on a singular influential experience with nature that changes an individual's view of or relationship with the natural world.

It is evident from the discussion above that much overlap exists between the terms used in the literature. While no study has yet attempted to compare and contrast the various terms, Duerden et al. (2018) created a framework to address designed or structured experiences. Designed or structured experiences have "definable beginning and ending points, durations ranging from a few seconds to a few hours, proceed uninterrupted by other activities, and are deployed (structured) through planned encounters" (Ellis, Freeman, Jamal, & Jiang, 2017, p. 4). While two of the profound experiences with nature described in this study occurred while participating in a structured experience (Erin's internship on the organic farm and Julie's group camping experience), it was not my intent to seek profound experiences that occurred during a structured activity; however, I do feel the framework proposed by Duerden et al. (2018) is worth reviewing as it is the first attempt I have discovered which attempts to categorize experiences.

Two distinct types of experiences were categorized: subconscious experiences and conscious experiences. A subconscious experience is "an experience where the objective elements fail to attract and hold an individual's attention sufficiently to produce a subjective reaction," and a conscious experience is "an experience where the objective elements attract and

hold an individual's attention sufficiently to produce a subjective reaction" (Duerden et al., 2018, p. 200). Conscious experiences can be ordinary, everyday occurrences, or extraordinary, infrequent events (Bhattacharjee & Mogilner, 2014). Three subtypes of extraordinary experiences were offered: memorable, meaningful, and transformative. Each of these subtypes of extraordinary experiences captivates an individual and produces a strong emotional response. The distinction lies in the individual learning something "significant and personally relevant" in the case of a meaningful experience, and undergoing "personal changes in values, beliefs, intentions, or self-perceptions" in transformative experiences (Duerden et al., 2018, pp. 206–208).

Reflecting on Duerden et al.'s (2018) conceptual framework and my review of literature related to profound experiences, I have gained a deeper understanding of how the previously described terms are defined and relate to and differ from one another. Table 1 outlines the key characteristics and emotions associated with previously described terms. As depicted in the table, each experience has the characteristics of the vividness of the moment and personal transformation felt by individuals. While negative emotions were observed in two of the experiences, feelings of happiness were associated with all of these phenomena. Also significant among these experiences was a sense of enlightenment and enduring effects.

Table 1

Characteristics and Emotions Associated with Related Studies

	Type	Peak experience	Mystical experiences	Conversion	Awe	Spiritual Experience	Extreme Sports in Nature	SLE	Quantum Change	Epiphany	Environmental Epiphany	Transcendent Experience	Wild Animal Encounters
	Author(s)	Maslow (1964)	James (1929)	James (1929)	Maslow (1964) Keltner & Haidt (2003)	Cohen, et al. (2010)	Brymer, et al. (2009)	Tanner (1980) Chawla (1998b)	Miller & C'de Baca (2001)	McDonald (2008) Jauregui (2007)	Vining & Merrick (2012)	Roy (2001) Williams & Harvey (2001) Davis (2016)	Perrin, et al. (2018)
Characteristics													
Personal transformation (psychological/ spiritual)		X	X	X	X	X	X	X	X	X	X	X	
Vivid/real/definite/ memorable		X	X	X	X	X	X	X	X	X	X	X	X
Profound beauty/aesthetic		X			X	X	X			X	X	X	X
Sudden onset/surprise/ unexpected				X		X			X	X			X
Fleeting/transient		X	X				X			X	X		X
Enlightening/ illuminating/insight into truths/meaning of things		X	X	X	X	X	X		X	X	X	X	
Enduring results/resolve		X	X	X		X	X	X	X	X	X	X	X
Ineffable/cannot be expressed with words		X			X	X	X		X	X		X	

High involvement/ deep concentration/ effortless/absorbing		X					X					X	
Peak/realization of one's true identity/ self-actualization/ fulfillment		X				X	X					X	
Sense of spiritual reality/transcendence		X	X	X		X	X		X	X		X	
Passivity/feeling as if being acted upon		X	X	X	X	X			X			X	
Emotions													
Happiness/positive		X		X	X	X	X	X	X	X	X	X	
Amazement/wonder/awe		X			X	X			X		X	X	
Ego-transcending/ Humility/ greater than self		X	X	X	X	X	X		X		X	X	
Peace/harmony/unified whole/ connection		X	X			X	X		X	X	X	X	X
Freedom/lightness/ loss of fear and anxiety		X	X	X			X					X	
Negative emotions			X	X	X	X			X	X			X

My research interest lies in understanding those experiences which are prompted by the natural world. While several phenomena discussed above are associated with the natural world, I wanted to use a general term that encompasses the varieties of different experiences described in the literature while also leaving open the possibility for discoveries. The term I chose to encompass the variety and abundance of extraordinary experiences occurring with nature is a profound experience with nature. As described in chapter 1, I define a profound experience with nature as an experience with nature that shifts an individual's view of or relationship with the natural world. This umbrella term supports and extends previous studies of related experiences.

I left the definition general to allow participants to define their experiences in their way. It was important to me to not set boundaries around how participants defined their own profound experience with the natural world. For some, the moment may have been intense, powerful, emotional, or new. For others, their experience could have occurred in a place they had visited many times or while doing something familiar.

I chose the term "profound" to describe these experiences because they are just that. They can be powerful, intense, enlightening, meaningful, unexpected, and memorable. The Merriam-Webster dictionary (2019) defines profound as 1) having intellectual depth and insight; 2) difficult to fathom or understand; 3) extending far below the surface; 4) coming from, reaching to, or situated at a depth; 5) characterized by intensity of feeling or quality; and 6) all-encompassing: complete. Profound can mean something different to each one of us. For the participants in this study, the memory of their profound experience with nature changed and defined the way they view themselves, their relationships with others and with nature, their behaviors, and in some cases, their entire lives.

Each of the previous studies contributed to the knowledge about profound experiences. While a few studies casually addressed the long-term implications of the experience (Merrick, 2008; Caston, 2014, Perrin et al., 2018), no study specifically explored the lasting effects of a profound experience with nature or what functions the memory serves for those individuals who experience this phenomenon. My research emphasizes a singular influential experience with nature, its long-term effects, and how individuals use the memory. I ground my work within the field of SLE to understand the potential of a profound experience with nature to significantly change an individual's perception of and relationship with the natural world.

Significant Life Experience Research

Tanner's (1980) research into the types of formative experiences in nature that led to conservation work as an adult was the catalyst for many future studies. He used what he called "a letter" to staff and officers of selected conservation groups asking for an autobiographical statement identifying formative influences, demographic information, and a resume documenting conservation work. Since this original study, researchers have engaged in various methods of inquiry and expanded the diversity of the sample populations, yet the findings have remained consistent, as described below.

Similar to Tanner (1980), Palmer & Suggate (1996) and Palmer et al. (1999) used questionnaires in the United Kingdom, and Australia and Canada, respectively, to research SLEs. These studies asked respondents to provide demographic information, details of their environmental practices and behaviors, and an autobiographical statement identifying influences and experiences on this behavior. Using a different approach, Chawla (1999) conducted a phenomenological study with 30 environmentalists in the United States and 26 in Norway to record participant's self-understanding of their significant life experiences. These foundational

studies demonstrated that early experiences in nature had a vital role to play in environmental behavior, but the mechanisms of this influence were not well established.

To understand why childhood experiences in natural places and the importance of role models who show appreciation for the natural world have lasting effects on individuals who work to promote environmental sustainability, Chawla (2007) proposed a framework based on the principles of ecological psychology and object relations theory. Four principles of ecological psychology are relevant in understanding the role of childhood experiences in creating lasting environmental concern. One is an emphasis on agency, which refers to the ability of an individual to move freely and explore the surrounding world. Perceptual learning, the idea of exploring and noticing new information in one's surroundings, is also pertinent to understanding how time spent in nature as a child affects environmental care and concern. Another principle, the value of organizations, acknowledges the importance of people gathering together in a shared space for a shared purpose. The fourth principle of ecological psychology is direct, firsthand experience in the natural world (Chawla, 2007).

To further understand the importance of time spent in nature during childhood and its effects on future environmental care and concern, it is important to understand the presence of adults during formative experiences. Adults give attention to the environment, express care for the natural world, disapprove of negative behaviors toward the environment, and express joy during time outdoors (Chawla, 2007). Furthermore, object relation theory considers when an adult shows sincere interest in the child and objects of interest such as the natural world, the child eagerly embraces it. Together, these two theories, ecological psychology and object relation theory, complement one another and offer a new framework for understanding how children develop into adults who show care and concern for the natural world.

A development model that identifies four critical periods of development offers another perspective for understanding the process in which children develop into environmentally involved people (James, Bixler, & Vadala, 2010). The first stage of development consists of direct, unstructured informal play and exploration in natural areas. Typical of this stage are unsupervised experiences, fantasy play, and searching and collecting behaviors (James et al., 2010). Adults, while not actively involved in this stage of development, are of importance because they allow children the freedom, space, and time to explore. Stage two involves less child-directed play and more traditional outdoor recreation activities with individuals beyond the immediate family and peers, and exploration expanding geographically beyond the immediate home and vicinity. During the third stage, individuals spend less time with immediate family members and instead engage in social relationships around natural history, ecology, and ethology activities. Individuals are intellectually stimulated by outdoor environments, take on more adult-like roles, such as volunteering or work, and explorations are spatially more extensive and last for longer periods of time (James et al., 2010). During the fourth stage of development, individuals solidify and embrace their identity as an outdoors or environmental person. Their social network has grown beyond family and childhood friends and has expanded to include Natural History, Ecology, and Ethology (NHEE) professionals and peers. While the focus of James et al. (2010) study was NHEE high achievers, the results do support the findings of previous SLE research, including the importance of unstructured time spent outside as a child and the presence of an environmental role model.

New directions in SLE research. Since Tanner's (1980) original study, SLE researchers have enlarged and redefined this area of research. In her 2006 review of research methods to investigate significant life experiences, Chawla (1998b) recommends ways in which researchers

could improve SLE studies. The studies below have employed some of these suggestions by expanding geographically to all parts of the globe, implementing new research methods and frameworks, enlarging the purpose of the research, incorporating comparison groups, and broadening study samples to include others besides professionals working for environmental care.

Social practice theory (Holland, Lachicotte, Skinner, & Cain, 1998) was used as a framework to explore the lasting impacts on environmental identity from former participants at three nature-based programs in Colorado. While the theory proved to be effective at understanding how individuals develop a 'social environmental identity,' or identification with an environmental group (Kempton & Holland, 2003), time in nature is also necessary to form an ecological identity (Williams & Chawla, 2016).

Offering the SLE field a unique geographic and cultural perspective, Li and Chen (2015) identified the significant life experiences of Chinese college students involved in environmental commitment: time spent in nature in childhood, involvement in organizations, witnessing environmental destruction, education, and positive role models. In a group of less environmentally active college students, Li and Chen (2015) identified participation in environmental organizations, formal educational experiences, nature experiences, and life principles as influential in the formation of environmental action, yet argue that the formation process is complex and accumulative.

The field of SLE research has begun to explore the formative experiences of climate change educators and activists (Fisher, 2015; Howell & Allen, 2016). Using internet-based research methods, Fisher (2015) engaged in exploratory life memory research to understand how young people understood their path to climate activism. Participants reported consciously

committing to engage in action for climate change, concerns for nature and social justice, and committing to the climate change movement itself. This research contributed to the SLE literature, because little research has been conducted on the life trajectories of youth climate activists. Likewise, data collection using voice chat and instant messaging is a novel method in SLE research. Lastly, Fisher's (2015) study sample included youth from 14 countries across the globe, including Minority World and Majority World countries, geographically expanding the field of SLE research. Similarly, findings of an online survey with individuals engaged with climate change education and mitigation indicated that childhood experiences in nature were not a significant influence for participants (Howell & Allen, 2016). Instead, social justice concerns were found to inspire action toward climate change.

Broadening the study samples of SLE research, Place (2016) used historical interpretive research methods to explore the impact of early life experiences in the natural world on five historical environmental/conservation figures. The findings indicate that the factors most consistent with the development of environmental and conservation views are time spent in nature in childhood, a family role model, and education. These findings are consistent with the most significant findings of previous SLE research.

A questionnaire distributed to 656 Israeli adults examined the cognitive, affective, and behavioral aspects of environmental literacy, which the authors argue focuses on "*actual environmental behavior* and not just knowledge of the subject" (Levy, Orion, & Leshem, 2018, p. 307). Environmental behavior was found to be influenced by both cognitive (knowledge components and thinking skills) and affective (attitudes and perceptions toward the environment) factors. This study is unique and contributes to the SLE literature in that it considered the role of

personal and social motives in environmental behavior and consisted of Israeli working adults, an underrepresented sample in SLE research.

Recognizing that little research explored what happens to an environmentally committed individual's relationship with nature over time, Cagle (2018) sought to understand how the nature experiences of 12 faculty members of the environment at Duke University changed throughout their lives. Cagle (2018) identified two new concepts that extend the SLE literature. Participants described a change in the amount of time spent in nature and the quality of the time spent in nature during their lives, resulting in participants feeling sadness or a desire to spend more time in nature (Cagle, 2018). This study sought to understand the differences and commonalities of experiences in nature over the lifetimes of environmentally committed individuals. The study expands the SLE field by encouraging other researchers to seek new avenues of research.

Also working within higher education, Prévot, Clayton, & Mathevet (2018) distributed a questionnaire to 919 French students of diverse academic curricula to understand the role of environmental education at university and previous personal characteristics on individual environmental identity. They conclude that time spent in nature plays an important role in the development of individual environmental identity, as well as in future life trajectories such as academic pursuits and jobs. These results support the findings of previous SLE studies. Of importance to SLE research, this study included students from different curricula with varying ecological emphasis, hence incorporating a comparison group, which Chawla (1998b) suggested was a weakness of past SLE studies.

Using both qualitative and quantitative research methods, including surveys and ethnographic observations, D'Amore and Chawla (in press) review the SLE research since its

inception, in addition to theories of child development. The study evaluates participants and leaders of family nature clubs and the short-term effects of these formative experiences with nature. D'Amore & Chawla's study offers a new insight into how a collective social experience, such as a family nature club, has the potential to "build a foundation for the next generation to form its own connection with nature and know how to act to protect the natural world" (p. 33).

Most significant findings. The goal of SLE research is to understand the formative nature experiences that are most influential in launching future environmental interests. As the research in this field has developed and expanded over the years, the findings have remained consistent. Participants describe the most influential experiences shaping their environmental attitudes, values, and behaviors, including outdoor experiences during childhood, participating in organized groups, family vacations, trips to environmental education or nature centers, memorable teachers or classes, books, and witnessing the destruction of a beloved natural space. Chawla (1998b) summarized the significance of consistent findings when she wrote, "The fact that the same cluster of results emerge under most conditions suggests that, across countries and cultures, people understand the sources of their environmental attitudes and actions in similar ways" (p. 361). Interestingly, a recent study (Howell & Allen, 2016) found the most important indicator for taking action for climate change is concern for social justice issues, rather than biospheric ones. This indicates that SLE scholars need to be open to the possibility of new formative influences on environmental action.

Critique of SLE research. Chawla (1998b) extensively reviewed the research methods used to investigate SLE and outlined numerous strengths. One strength is the qualitative nature of the research allowing scholars to explore "the emotional and interpretive side of environmental experience" to fully grasp the entirety of it (p. 361). This qualitative work include

the use of open-ended methodologies, which allow respondents the time to consider their responses. It often employs a lifespan perspective as participants are asked to recall formative experiences in nature that may have occurred decades ago. With almost 40 years of research, the SLE field has grown and expanded from Tanner's (1980) pioneering research. Studies are becoming more diverse and focusing on women, as well as people from different countries, cultures, and ethnic backgrounds (Chawla, 1998b). There is a new interest in understanding how individuals of varying age groups interpret their formative experiences in nature, and efforts have been made to design longitudinal studies.

While the strengths of SLE research are numerous, the field also has areas in which it can improve. One such area needing improvement is the inconsistency in questions, criterion measures, and categories of analysis in existing studies. To address this inconsistency, Chawla (1998b) recommends that future researchers place emphasis on responsible environmental action rather than merely concern, develop tools to measure levels of concern and activism, and, when possible, use consistent questions. Chawla (1998b) also recommends the use of consistent categories of analysis and criterion measures to ensure intercoder reliability. To account for the lack of control for multiple mentions per respondent of formative experiences, Chawla (1998b) recommends researchers report the average number of formative experiences described during the interview. Chawla (1998b) stresses the importance of recognizing the interpretive function of memory and suggests researchers integrate the research on autobiographical memory into future studies. Finally, SLE researchers need to recognize the "power of memory to interpret and construct life identities" (Chawla, 1998b, p. 370). This last point is of utmost importance to my study because the participants are the only ones who genuinely understand the profundity of their experience and the after effects of it.

Reflecting on my research and its potential contributions to the field of SLE research, it incorporates five of Chawla's (1998b) recommendations for improving SLE studies. First, this research uses consistent questions across all 21 interviews, which are based on questions used in previous studies of related phenomena (Liddicoat & Krasny, 2014; Merrick, 2008). Second, I account for intercoder reliability by including two external coders in the data analysis process. Third, unlike other SLE studies, I did not limit my study sample to include only individuals committed to environmental care and protection. My study participants work in diverse professions such as optometry, physical therapy, education, parks and recreation, clinical psychology, and self-employment, among others. Fourth, I recorded the age at which individuals recall having a profound experience with nature. Finally, unique to my study, I incorporated research on memory use and the functions of autobiographical memory resulting from a profound experience with nature.

Below, I delve into the memory literature related explicitly to autobiographical memories and memory function to garner a basis for understanding how individuals describe the long-term effects of a profound experience and how they use the memory of it in their lives.

The Concept of Memory

Memory is the act of remembering or the ability to recall previous events or experiences. Cognitive psychologists once compared memories to computer files, essentially bits of data only accessed when needed (Schacter, 1996). Now, memory is recognized for much more than the ability to remember the past. Schacter (1996) writes,

> [Memory] is composed of a variety of distinct and dissociable processes and systems... Acting in concert, these memory systems allow us to accomplish the tasks of our daily

> lives while also supplying our intellect and emotions with ideas and feelings from the past that allow us to act with purpose and live rich emotional lives (p. 5).

While an in-depth study of memory research is beyond the scope of this dissertation, it is relevant to briefly examine the different types of memories before focusing specifically on autobiographical memories and the functions memories serve.

Types of Memories. Memory scholars distinguish between two kinds of memories: short-term memories (STM) and long-term memories (LTM). Short-term memory is based on temporary electrical activity within the brain, whereas LTM is based on the development of more permanent neurochemical changes (Hebb, 1949). As research in memory progressed, LTM was further divided into nondeclarative (implicit) memories and declarative (explicit) memories. Nondeclarative memories describe implicit memories that do not require conscious thought, such as motor skills, perceptual skills, cognitive skills, habit formation, and "other knowledge that is expressed through performance rather than recollection" (Squire & Zola-Morgan, 1998, p. 233).

Similarly, Baddeley (2001) and Baddeley, Eysenck, and Anderson (2009) defined declarative memories as those memories that a person can retrieve at will, whereas nondeclarative memories are not recalled consciously. Declarative memories can be further distinguished between semantic memories, those memories about general knowledge, and episodic memories, which are tied to specific events (Baddeley, 2001; Baddeley et al., 2009).

In my research, I studied episodic memories associated with profound experiences with nature. The basis of my decision to study memories of a particular phenomenon is the fact that the experience can be considered a single experience with specific episodic memories associated with it. The memories recounted in this study are personal and unique to each individual, in essence, an autobiographical memory.

Personal memory, personal event memory, and autobiographical memory. Episodic memories related to one's personal experiences have been most often referred to in the literature as personal memories, personal event memories, or autobiographical memories. Brewer (1988) describes a personal memory as "a recollection of a particular episode from an individual's past… 'reliving' of the individual's phenomenal experience during the earlier episode" (p. 22). Pillemer (1992) prefers to use the term personal event memory to describe a memory that represents a specific event in one's life. Nelson (1993) describes autobiographical memory as a "specific, personal, long-lasting, and (usually) of significance to the self-system … it form's one's personal history" (p. 8). Kihlstrom (2009) describes autobiographical memories as not only remembered events but also episodes related to oneself ("auto") and which is part of one's life story ("biography"). For consistency, I will use the term autobiographical memory throughout my dissertation to describe those memories that are personal and tied to a specific event in one's past.

Why we remember. Memorable and impactful events are momentous, characterized as having a "sense of importance, definiteness, and brevity," and include trauma, first hearing the news of a traumatic event, critical incidents, and moments of internal illumination or sudden insight (Pillemer, 1998, p. 27).

Traumatic incidents are rare, but the effects are devastating. Some events, while not experienced firsthand, can still be momentous when an individual hears of it for the first time. These experiences are often shocking and can have enormous consequences, and can include a natural disaster, results of political elections, the death of a prominent figure, or even a highly anticipated sports event. Most momentous events are not traumatic or newsworthy but instead occur within one's normal flow of life events (Pillemer, 1998). These events are critical because

they have the potential to inspire and influence a person's life, such as through recognizing a troubling aspect of one's current life, big disappointments, and major life transitions. Insightful momentous events are times in a person's life in which new information is learned (whether about one's self or the world), are accompanied by strong feelings, and can be a turning point in one's life.

Pillemer (1998) reasoned that the personal circumstances occurring in one's life at the time of an event make the experience influential and memorable. These circumstances include when and where the event occurred, and what the individual saw, felt, heard, and experienced at the moment. He proposed that the memory representations of momentous events, which he termed personal event memories, have the core characteristics of specific, detailed, sensory, a particular moment, and truthful representation. Similarly, to understand why momentous events are influential and have lasting effects, Caston (2014) reported that contributing factors, or what was happening in an individual's life at the time of a transformative experience with nature, could help an individual understand the meaning of the experience.

Functions of autobiographical memory. Function refers to "the real-world usefulness or adaptive significance of memory mechanisms" (Bruce, 1989, p. 45). Two separate yet related meanings of "function" are discussed in the literature: adaptive significance and real-world usefulness. The *adaptive* function explains how and why human memory evolved. Brown and Kulik (1977) argued that "flashbulb" memories, those memories related to surprising and significant events, serve an adaptive function by providing necessary information for personal safety and survival. In contrast, Neisser (1988) suggested that the adaptive function of autobiographical memories provides social and personal identity benefits: individuals use flashbulb memories to understand and define their self-concept and social interactions as they

relate to the event. *Real-world usefulness* focuses on how memories influence an individual's daily life (Bluck & Alea, 2002; Pillemer, 1992). Pillemer (2009) argued that "real-world usefulness refers to the concrete memory operations performed in practical contexts and everyday tasks…by mentally reliving events of past day" (p. 1194). My research relies on the latter meaning of function, specifically how the memory of a profound experience with nature influences an individual's life.

Historically, memory research focused on how memory worked, with minimal emphasis on understanding why memory works the way it does (Bluck & Alea, 2002; Bluck, 2009). It was only in the late twentieth century that scholars began to delve into memory function research (Liddicoat & Krasny, 2014). Since that time, much has been written about the functions memories serve.

Pillemer (1992) suggested three distinct functions of memory: communicative, directive, and psychodynamic. The communicative function entails the sharing of a personal memory with another. In the directive function, memory is used as a guide in decision-making and it can affect present and future behaviors (Pillemer, 1992). The psychodynamic function refers to the emotional and psychological impact experienced by the one recounting the memory and the one listening to the recollection. With a focus on psychotherapy, Pillemer (1992) noted that remembering a past personal experience "triggers emotional expression, which provides an opportunity to master the emotion and thereby lessen its nonconscious influence" (Pillemer, 1992, p. 248). Other memory scholars did not fully embrace Pillemer's use of the term "psychodynamic" and instead chose to use the term "self," with an emphasis on self-continuity or how a sense of self changes over time.

According to Kihlstrom (2009), the most basic function of autobiographical memory is to remember individual episodes of past experiences consciously. An autobiographical memory serves both intrapersonal and interpersonal functions. The intrapersonal function of memory refers to thinking about a past personal memory to gain a better understanding of oneself, while whereas, the interpersonal function is concerned with creating social interactions through the sharing of that memory (Kihlstrom, 2009). While Kihlstrom (2009) did not explicitly state a directive function of memory, he acknowledges that a memory may serve many purposes.

While both overlap and distinctions are evident in early work on the functions of autobiographical memory, a review of the theoretical work on memory function (Bluck & Alea, 2002) concluded that most hypothesized functions fit into one of three categories: self, social, directive. Furthermore, while the three functions of memory are often referred to with "discrete labels" in the literature, "they do not necessarily represent discrete categories in everyday behavior or mental life" (Bluck & Alea, 2002, p. 6). To be consistent with the literature, I will refer to the functions of memory as discrete categories.

Self. Understanding one's self is an important function of autobiographical memory. Reflecting on past events can help individuals understand who they are today, serving an intrapersonal function (Kihlstrom, 2009). Autobiographical memories allow individuals to consider what events from their pasts shaped who they are today. People can question who they today, how they have changed, and how they stayed the same over time (Bluck, Alea, Habermas, & Rubin, 2005, p. 110). The concept of looking back on past events and considering if and how a sense of self has changed over time is referred to in the memory literature as self-continuity. (Bluck et al., 2005; Brewer, 1986; Conway, 1996; Fivush, 1998; Neisser, 1988). The literature suggests that the self function of autobiographical memories can be used to maintain a sense of

self over time or to update oneself while maintaining a sense of continuity (Bluck & Alea, 2009; Conway, 2005). Taking it a step further, some researchers attest that autobiographical memories offer knowledge of the self in the past, which is reflected in the present, and even projected into the future so as to get a sense of self over time (Bluck & Alea, 2009; Conway, Singer, & Tagini, 2004; Neisser, 1998). Hence, autobiographical memories allow an individual to gain a better understanding of self over time.

Social. The sharing of an autobiographical memory establishes an essential form of social interaction and binds individuals together (Kihlstrom, 2009). Furthermore, the act of sharing a memory is communicative and conveys meaning beyond the specifics of the particular informational content of memories, thereby serving an interpersonal purpose (Pillemer, 1992). The social function of memory serves to instill social interaction, empathy, and social bonding (Bluck & Alea, 2002). Sharing a personal event invites both the speaker and the listener to "go deeper" in the conversation, allowing the speaker to be open and show emotions, while the listener is encouraged to respond with a similar personal story. This mutual sharing creates social bonds and instills empathy in the conversation (Pillemer, 1992).

Directive. An autobiographical memory also serves a directive function by encouraging individuals to think about past events as they make present and future decisions (Bluck et al., 2005; Liddicoat & Krasny, 2014). Reflecting on a past event has the potential to influence feelings, behaviors, and attitudes (Pillemer, 1992).

Memory directives exist as memorable messages, symbolic messages, originating messages, anchoring messages, turning points, and analogous events (Pillemer, 1998). When someone speaks who is in a position of power or respect, or who is loved, the words have the potential to be memorable. Similar to a memorable message, a symbolic message is often

indirect, when the speaker's intent is not necessarily to deliver a directive yet the words are memorable to the receiver (Pillemer, 1998). An originating event is tied to a single momentous event, which inspires an individual and serves as "a source of motivation and reorientation in the pursuit of life goals" (Pillemer, 1998, pp. 70–71). While an originating event can affect a life course, an anchoring event can solidify one, serving as a point of reference for continued beliefs. An event can alter or change an individual's life course, thus becoming a turning point in a person's life, allowing them to refer back to the event for continued inspiration and guidance. Present circumstances can trigger the memory of an analogous event, similar in structure, surface details, or only abstract relationships to the previous situation and ultimately affecting current beliefs and activities by analogy (Pillemer, 1998). While Pillemer (1998) identifies six functional categories of personal event memories, he also states they are not mutually exclusive and have the potential to overlap.

Very few empirical studies have focused specifically on memory function. A Thinking About Life Experiences (TALES) questionnaire (Bluck et al., 2005) tested the three functions of autobiographical memory. The results indicate that individuals use the directive function to understand better how unexpected events fit into their lives, while the self function is used to determine whether an individual is the same person today as in the past (Bluck et al., 2005). Two social functions of autobiographical memory emerged: nurturing and developing relationships. The nurturing aspect refers to the sharing of a memory to help the listener feel better, whereas sharing an autobiographical memory can also be used to develop new relationships (Bluck et al., 2005).

Critique of memory function. The memory literature suggests autobiographical memories serve directive, self, and social purposes (Bluck & Alea, 2002; Kihlstrom, 2009;

Liddicoat & Krasny, 2014; Pillemer, 1992). However, concerns over the validity of using memory to recall past events exist. One study found that individuals often recall specific details of an event differently (Ross, 1997). However, accuracy in autobiographical memory may not necessarily be the most important function. Neisser (1988) suggests that the greatest function of memory is utility. Chawla (1998b) elaborates on the importance of utility in memory, "As we move through our lives, what matters most to us are not precise details about the past, but how we interpret and use the past in meeting the challenges of the present and in anticipating the future" (p. 364). Thus, what is most important is not the minute details of an event, but what they mean to an individual and how they affect his or her life.

Another concern with the use of memory in recalling past events is the idea of a general memory loss occurring with age or distance from the events. One study (Howes & Katz, 1992) examining the use of recall across the lifespan related to both public and autobiographical events countered the concern of memory deteriorating with age. The results of the study indicate that older- and middle-aged individuals recalled personal events across their lifetimes equally well when prompted by cue words (Howes & Katz, 1992). Even more significant was the finding that "there was a general superiority in recalling autobiographical over public events" (Howes & Katz, 1992, p. 105). This finding suggests people can recall autobiographical events from across their lifespan, even remote events, especially when provided with a cue word. The findings of similar studies (Larsen, 1988; Rubin, Wetzler, & Nebes, 1986) confirm the role of a cue word with memory recall.

While memory function literature overwhelmingly suggests three main uses of memory (directive, self, and social), the question remains whether memory can serve functions other than these three. Pasupathi (2003), for example, suggests an emotional regulation function of memory

may exist during memory sharing. My research into the lasting effects of a profound experience with nature also attempted to answer this question. I interpreted the data with themes describing how individuals use the memories of their profound experience with nature. While I ultimately compared these themes to the functions of memory found in the literature, I also remained open to the idea of participants recounting new or additional functions of their memory (Chapter 4).

Connecting Profound Experience, SLE, and Memory Research

This multidisciplinary literature review synthesized the research on profound experiences to distinguish between the definitions, descriptions, theories, and frameworks offered by others. While acknowledging the past efforts of research, I recognized the need for the creation of a new term to describe those experiences that shift an individual's view of or relationship with the natural world, which I termed a profound experience with nature. I chose to situate my research within the larger body of SLE research, a discipline that investigates the associations between incremental formative experiences in nature and resulting environmental concern and action. I believe my research can inform SLE research about the potentially lasting effects of a singular meaningful experience with nature. Consistent with previous studies of related phenomena, the stories of profound experiences shared and analyzed in this study all happened in the past. My research relies on the participants' ability to recall their memory of a profound experience with nature, its subsequent effects, and how they use the memory in their lives. Applying the memory function framework, I explore the influences of a profound experience with nature to determine whether it adequately accommodates the functions that people say their memories serve.

Chapter 3: Research Design

The goal of this research is to explore the lasting effects of profound experiences with nature and learn how participants use these memories throughout their lives. Twenty-one adults who had a profound experience with nature participated in a semi-structured interview exploring how they make sense of their experience, the meaning they attribute to it, and the role it served in their lives. Specifically, I wished to answer the following questions:

1. How do individuals describe the influences of their profound experience with nature?
2. How have individuals used their memories of their profound experience with nature?
3. What functions do these memories serve?

Study participants selection

For this research, I solicited potential participants in three ways. First, I conducted a pilot study in Fall 2017 with a local environmental commission. Five commissioners participated in the pilot study, two of whom self-identified as having had a profound experience with nature and volunteered to participate in the current study. Second, I used purposeful sampling to solicit potential participants from two groups, The Watershed Institute in Pennington, New Jersey and alumni from the Ecological Teaching & Learning (ETL) graduate program at Lesley University in Cambridge, Massachusetts. Purposeful sampling involves identifying and selecting individuals who are experienced with and knowledgeable about the phenomenon of interest (Creswell & Plano Clark, 2018). I distributed an electronic recruitment flyer (Appendix A) to the various mailing lists associated with The Watershed Institute and posted it on ETL's alumni Facebook page. Thirdly, I asked study participants to share the study with others who might be interested in

participating in the study. Interested individuals were asked to contact me via an embedded link that led to a Survey Monkey page on which participants entered their contact information. I then contacted potential participants via telephone or email and asked them to briefly describe their profound experiences with nature and if they would be willing to meet with me in person, via webcam, or phone. Potential participants had to meet the following criteria:

- 18 years of age or older
- Self-identifies as having had an experience that shifted their view of, or relationship with, the natural world
- Ability to recall and share the memory and effects of a profound experience with nature

Individuals who met the criteria were scheduled for an interview based on location and availability. I contacted participants at least two days before the interview to confirm the time and place of the interview. I interviewed 21 of the 24 people who expressed interest in participating. Three individuals who initially expressed an interest but did not participate did so either because they did not respond to attempts to arrange the interview or because they felt the memory would be too emotional to share. Each interview was audio-recorded and transcribed by the transcription service Rev.com. I listened to each interview in its entirety while going over each transcript to confirm transcription accuracy.

Participant ages ranged from 30 to 68, with a mean of 48. Seventy-one percent of participants were female, while males represented 29%, and all were Caucasian except for one who also identified as part Native American. All participants but one were college educated, with the majority of the participants (76%) also having advanced degrees. At the time of the interview, one participant was a student, one was retired (4.8%), and the remaining 19

participants were working professionals. Sixty-two percent reported supporting or being a member of an environmental or nature-based organization.

Data Collection

Twenty-one participants engaged in individual semi-structured interviews consisting of four guiding questions and eight additional questions. My interview protocol (Appendix B) asked primarily open-ended questions that "build upon and explore" (Seidman, 2006, p. 15) participants' responses to encourage their reconstruction of profound experiences with their personal nature stories.

The content of the interview questions was meant to elicit both perceived impacts and memory uses of a profound experience with nature, and was derived from Merrick (2008), Miller and C'de Baca (2001), Caston (2014), and Liddicoat and Krasny (2014). Similar to Merrick (2008) and Caston (2014), I began interviews by asking participants to recount their profound experience with as much detail as possible. Next, I asked participants why they thought this experience was so memorable. I then inquired what meaning this one particular experience holds in their lives. This was followed by asking if and how the meaning has changed over time. I asked if they saw themselves differently than before the experience. Finally, I invited participants to describe the effects of their profound experience with nature. If a participant needed additional prompting, I used guiding questions to solicit more information related to the time of the event, the actual experience itself, or the after effects (Appendix B).

Each interview was audio recorded in its entirety after gaining participant permission. Each interview lasted from 30 to 75 minutes, with a mean interview time of 51 minutes. The majority (57%) of the interviews occurred in person at a location convenient for the study participant and me. I conducted the remaining interviews via webcam (29%) or phone (14%).

During the interview, I noted observations of participant body language, verbal tone, and emotional state. At the end of the interview, I asked participants for permission to contact them with follow-up questions if necessary.

In total, I conducted 21 interviews, the sample size ultimately determined by the number of potential participants and research timeline constraints. By the end of the interviews, I began to notice patterns in the effects and uses recounted by the participants. Fusch and Ness (2015) write, "Data saturation is reached when there is enough information to replicate the study, when the ability to obtain additional new information has been attained, and when further coding is no longer feasible" (p. 1408). In addition, Holloway, Brown, and Shipway (2010) suggest that for data to be saturated, qualitative researchers must allow the data to represent the voices of the participants and not of the researcher. To accomplish this, I used inductive analysis to draw conclusions from participant narratives rather than a predetermined framework, as described in the following section. The themes I created weave across all the profound experiences shared during the interviews, indicating I reached saturation.

Data Analysis

Overview. To understand the lasting effects of a profound experience with nature and how the participants report that they use the memories of their experience, I applied Braun and Clarke's (2006) thematic analysis (TA) to identify, analyze, and interpret the interview data. I used a combination of inductive and deductive approaches to analyze the data, the former to allow the data to speak for itself and the latter to check if it fit into the pre-established memory function framework. The inductive approach was necessary to learn how participants came to understand the effects and uses of their profound experience with nature, rather than assigning themes derived from the literature. To ensure intercoder reliability within my data, I enlisted the

help of two qualitative researchers, both of whom have earned a doctorate and have extensive qualitative research experience.

To develop a preliminary interpretation of the data, I engaged fully with it, listening to each audio recording, reading interview transcripts more than once, identifying keywords and phrases and writing summaries about the effects and uses of each participant's experience. As I read each transcript, I coded the data by identifying interesting or meaningful keywords and phrases related to the effects of a profound experience with nature. I worked systematically through the entire data set, coding each interview entirely before moving onto the next. I continuously referred back to previously coded data to ensure each new code was unique and no overlap occurred. This was a necessary step because often participants used different words to describe similar effects of their experience. One participant stated she felt awe and wonder as she watched the ants carrying small bits of soil; later she referred to it as "a wow moment." While I initially highlighted each of these words, ultimately they were combined into one code to express that feeling of awe.

I made note of any words or phrases that appeared in more than one interview to help with inductive theme development. For example, if more than one participant used the words awe or wonder to describe his or her profound experience with nature, I noted this as possibly important. Likewise, if one participant used a word that no one had, yet it seemed significant in some way, I noted it. I wanted to ensure I was capturing the true essence of each participant's experience and subsequent effects. At the end of this step I had highlighted countless codes representing the results and uses of a profound experience.

After this initial coding, I began to look at the data as a whole. I looked for relationships between codes and worked to combine them into subthemes. For example, while all participants

spoke about changes in their relationship with nature, they used different words to describe how it changed, such as connection, interconnection, interconnectedness, one with nature, one with everything around me, a moment of cohesion, or less apart from nature. Rather than having an individual theme for each term, I combined them under the subtheme of connectedness.

Once I developed initial subthemes, I needed to determine if and how they combined naturally into themes in a manner that could describe the effects of the experience. I created a coding guide that included a sampling of inductively created codes and subthemes, and the three memory function themes, which was sent to the coders for review (Appendix C). The coding guide was revised numerous times in consultation with the coders, evolving from a simple interpretation to one of depth, genuinely reflecting the effects described by the participants.

Once it was agreed that the subthemes were distinct, I connected the subthemes into themes that worked across the entire data set. I searched for any overlap between themes, which involved looking at individual themes while also considering how each theme related to the other themes. I created a composite description for each theme before assigning it a name, which enabled me to identify the relationships between various parts or subthemes that comprised each theme. Once I was able to describe the connections between the subthemes, it was easier to name the theme. Throughout this process, I revisited the data to ensure I was accurately reflecting the essence of each effect reported from the profound experiences with nature, and used participants' own words as much as possible in the composite descriptions.

This inductive analysis, conducted in collaboration with my two coders, resulted in four themes that combine to form a composite story detailing the effects of a profound experience with nature and how individuals use the memory of their experience in their lives. These four themes were: becoming authentic, changing social relationships, living with meaning, and

reliving the past. These themes are vibrant and accurately describe the lasting effects of a profound experience with nature shared across most of my participants.

After successfully coding the data inductively, I analyzed my data deductively to determine if my findings were consistent with the three functions of memory discussed in the literature. Because I completed this portion of the data analysis after I ceased working with the coders, an intercoder reliability check was not conducted. I reviewed my data and attempted to see if it fit into the three functions of memory (self, social, or directive) or if some of the data did not fit perfectly and hence would suggest further research and the possibility of a new function of autobiographical memory. I determined that participants' uses of the memory of their profound experience with nature are consistent with the three functions of autobiographical memory. Additionally, I identified a possible fourth function of autobiographical memory absent from the literature: developing and appreciating relationships with other-than-humans.

Validity Issues

Lincoln and Guba (1985) suggest four criteria to include in a qualitative research study to establish validity and trustworthiness: credibility, transferability, dependability, and confirmability. Below I address how my research exhibits the four criteria needed to establish validity.

Credibility. For a study to establish credibility, it must measure what is intended. Lincoln and Guba (1985) refer to this as member checking, which refers to eliciting the participants in a study to review the written interview transcripts, "analytic categories, interpretations and conclusions" (p. 314). I established credibility by soliciting feedback from the participants regarding my interpretation of the effects of their profound experiences with nature. I emailed participants the final themes and composite descriptions and asked if the themes

represent the effects they experienced, and if so, which theme(s) best represented their effects, or if not, how would they describe the influences of the experience. Seventeen of the 21 participants (81%) replied to my request; all of them confirmed that the themes accurately represented the effects of their experience.

Five participants stated that they saw their effects reflected in all four themes. Three of the participants identified with three of the themes. Five of the participants felt the effects of their profound experience with nature was represented in two of the themes, while three of the participants identified with just one of the themes. One participant stated that the first three themes applied to his experience; however, he felt my composite descriptions did not adequately reflect the profoundness of his experience and his resulting relationship with the natural world. He could not recall the words he used in our interview, but in his email response, he described how he felt about his relationship with the natural world. He used the words "awestruck, electrified, luminous, sense of wonder, magic, universal truth, Holy." Related to the theme of living with meaning, this participant stressed how this theme could apply to both the macro- and microdecisions made each day. He referred to the macrodecisions such as a career choice and living an environmentally friendly lifestyle, while the microdecisions include taking the long way home, daily walks, stepping outside barefoot each day to feel the earth under his feet. He wanted me to understand how vital nature is to his life and how his life is so intertwined with the natural world. The feedback from this participant, as well as the affirming responses I received from other participants, enhanced my understanding of just how powerful the effects of these experiences can be for the individual. While I did keep the final themes as developed, I revised the composite description of the first theme slightly to include the words "universal truth" to

more fully represent the effects of the experiences in response to the feedback from the one participant.

Another way I worked to ensure credibility was through peer review. Lincoln and Guba (1985) refer to this process as peer debriefing, "It is a process of exposing oneself to a disinterested peer in a manner paralleling an analytical session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer's mind" (p. 308). As described above, I employed two outside coders to evaluate my findings. Each had an opportunity to look at pieces of the data and code it individually. We then discussed any differences in the interpretations and worked together to reconcile those differences. This involved negotiations over word choice and meaning, such as whether the word "change" or "shift" was better in naming a theme or whether "deepening" would better represent the impacts participants described. In this example, one coder suggested that using the phrase "change in" limits whatever term follows it and that "change in" implies the transformation that I am already documenting, so it seemed redundant. As a result, I decided not to use the phrase "change in," instead using more specific words to begin each theme. In the end, I am confident the final themes that emerged from the data are vibrant and reflect the effects as described by the participants.

Transferability. Transferability is concerned with how one's research findings apply to other contexts. In qualitative research, researchers must provide a detailed account of their study and readers must decide for themselves whether similar processes can work in their settings (Bloomberg & Volpe, 2016). Because of the vivid details of participant's interviews that I provide in this dissertation, other profound nature experience researchers can use the findings to determine their potential transferability. Specific aspects of my study context may affect

transferability. To begin, I chose to use an open definition for my phenomenon of interest, rather than a more structured definition. Utilizing an open definition allowed potential participants to define profound for themselves, thereby opening the study to more variety among experiences. Likewise, limiting the participant selection to individuals associated with the Watershed Institute or alumni of the Ecological Teaching & Learning program limited the demographics of the study population to people interested in or associated with these two organizations. In contrast, soliciting from the general population may have resulted in a more diverse study population with different backgrounds and interests.

While my findings must be recognized within the specific confines of the study, Shenton (2004) argues that similar projects using the same methods but conducted in different settings may offer a more comprehensive picture of the phenomenon of interest. Because Merrick (2008), Caston (2014), and Liddicoat and Krasny (2014) provided detailed information about their research designs, I was able to apply certain aspects of their studies to my setting. Likewise, my study can serve as a baseline for future studies investigating the effects of a profound experience with nature under different circumstances.

Dependability. Dependability relates to what is sometimes called an audit trail. A researcher must provide enough information so that other scholars can follow the process and procedures used to collect and analyze data (Bloomberg & Volpe, 2016). Shenton (2004) referred to this concept of validity as the ease in which similar results would be obtained if my study was repeated in the same context, with the same methods, and using the same participants. As the researcher, I needed to demonstrate that the methods I used to collect and analyze the data were consistent. I accomplished this by including an extensive description of my methods and research context, allowing researchers to replicate the study parameters if they so choose.

Confirmability. Confirmability deals with the ability of the researcher to remain objective. Bloomberg & Volpe (2016) suggest, "The implication is that the findings are the result of the research, rather than an outcome of the biases and subjectivity of the researcher (p. 87). Similarly, Shenton (2004) writes, "Here steps must be taken to help ensure as far as possible that the work's findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher" (p. 72). While coding the data inductively, I attempted to achieve confirmability by repeatedly immersing myself in the data, thereby allowing the themes to emerge naturally rather than making the data fit into pre-existing themes. The two external coders also were vital in helping me remain objective and recognize my biases. In the end, much effort was undertaken throughout the data collection and data analysis process to establish the validity of my study.

Ethical Considerations

Researcher objectivity. What prompted me to study the effects of a profound experience with nature was my own profound experience. Hence, before beginning this research I believed a profound experience with nature had the potential to change a person and their relationship with the natural world. As I conceptualized and conducted this research, I sought to avoid bias in all aspects of my study including the research design, data analysis, and interpretation. Nevertheless, I acknowledge it may have been impossible to remove my values, my beliefs, and my experience entirely from my process.

To minimize or prevent researcher bias, I consulted with scholars who conducted similar research to learn about the successes and challenges of their research. I kept the wisdom they imparted in mind as I crafted and conducted my research. To ensure consistency across all the interviews, I based my interview questions on those used by researchers of related studies and

asked consistent guiding questions in each interview. Likewise, to provide intercoder reliability, I consulted with two outside coders throughout the data analysis process. I also sought feedback from the participants to ensure the themes accurately represented the effects of a profound experience with nature.

Participant well-being. Another factor to consider is that of the researcher and study participant relationship. I recognize that in my position as the sole researcher, participants may have tried to answer the interview questions in a way they thought I wanted them to answer. To limit this potential, I limited my reactions to their responses and avoided giving affirming replies or gestures. I also refrained from sharing the story of my profound experience with nature with the participants.

Related to the researcher and participant dynamic, it was important for the participants to understand the purpose and intended outcomes of the research. I discussed this information with each participant, as well as the potential risks and benefits associated with participation in this study. The risks were minimal in that participants had the potential to experience strong emotions related to the recalled profound experience with nature, but that potential was not greater than those emotions ordinarily encountered in daily life. While a few participants did become emotional during the interview process, each was given time to regain him or herself and was able to complete the interview.

Care was taken to ensure the participants' rights and welfare were protected. Before the start of the interview, each participant was given an informed consent form to read and sign (Appendix D). I reminded participants that their participation in the study was voluntary as outlined on the informed consent form. Participants had the option to stop the interview at any

time or state that they do not wish to have certain portions of the interview included in the analysis of the research.

All disclosed information was kept confidential and secure. I ensured participants the information they shared would never be associated with their personal information or with any distinguishing characteristics of their identity. I kept interview transcriptions in my school Google Drive folder, which is password protected. A pseudonym was used for each participant, which is the name used throughout this dissertation. Finally, I informed the participants that the results of the study may be reported in journal articles, books, chapters in books, dissertation papers, and conference presentations.

Chapter 4: Results

The profound experiences with nature shared by the 21 participants in my study were diverse and unique, ranging from intimate encounters with nature to reading a book or to a social encounter with a child from a different culture. This chapter provides an overview of these experiences, followed by an exploration of dominant emergent themes and the memory functions a profound experience serve. In the final section, I present additional findings that emerged through analysis.

Participants' Profound Experiences with Nature

The profound experiences shared by the participants were unique and displayed the diversity of experiences one considers profound. As depicted in Table 2, the recounted experiences are quite diverse and display the variety and uniqueness of a profound experience with nature.

Table 2

Overview of experiences with nature participants described as profound

Bridget	Watching ants collect and carry soil to an anthill
Tina	Reading the book *13 Original Clan Mothers*
Joseph	Seeing baby birds in a nest for the first time
Lindsay	Falling in love with rocks on the side of a volcano
Ruth	Sleeping in a canoe on a lake by herself
Ashley	Driving with her parents and seeing trash on the sides of the highway
Tracy	Encountering a boy who told her she peed in her water
Melanie	Learning to swim at age 49

Erin	Interning on an organic farm
Jonathan	Witnessing the changes in tree species at a scout camp
Stephanie	Playing in abandoned fields near her home
Nicholas	Seeing a Hummingbird in his backyard
Michelle	Working on a wood turtles research project in Nova Scotia
Julie	Camping overnight for the first time
Susan	Seeing an image of nature in a social worker's office
Kyle	Thru-hiking the Appalachian Trail
Hope	Encountering a giant cuttlefish while scuba diving
Jeffrey	Giving cabbage to three women in a high-rise apartment complex
Mary	Becoming a rock on her grandmother's farm
Kim	Walking into Mariposa Grove and seeing giant Sequoias for the first time
Chad	Meeting a white-tailed deer while fly-fishing

Bridget. Almost fifty years ago, when Bridget was eight years old, she had her profound experience with nature. Standing in her backyard, she became absorbed by the sight of ants transporting individual particles of soil in their mouths as they built anthills. Fascinated by the work ethic of the ants and their connection to the soil, Bridget stood still and watched the ants. She described it as an awe moment during which it felt as if time stood still, and she recognized the interconnectedness of all living creatures.

Joseph. Joseph shared a profound experience with nature that happened over 60 years ago when he was 6 or 7 years old. While hiding during a game of hide-and-seek, Joseph became aware of movement in the shrub before him. He watched as a bird flew into a nearby bush.

Joseph looked in the shrub and found a nest containing baby birds. The birds were wobbling and did not behave like anything he had ever seen before. At this point, Joseph was completely disconnected from the game and remembered wanting to stay and protect the baby birds instead of rejoining the game. Joseph has memories of visiting the nest the next day and finding it destroyed. He felt devastated by seeing the nest destroyed, for he felt a kinship and a connection with the birds in the nest.

Tina. About eight years ago, Tina had her profound experience with nature while reading the book *13 Original Clan Mothers*. The book detailed a different way of interacting with nature, one in which everything in the world consists of energy, which felt foreign to Tina. She experienced a powerful emotional response to the book and had to put it down. Some time passed before Tina began to reread the book, at which time she felt more comfortable accepting the book's message of nature acting as a living being and communicating with humans through energy exchange. Tina began implementing what she was learning from the book in her everyday life by acknowledging that everything has energy and thus deserves respect, care, and attention.

Jeffrey. Jeffrey's profound experience with nature occurred two years ago at the age of 63 and involved three heads of cabbage. He volunteers for an organization that provides fresh local produce to food-insecure individuals. One day after delivering the produce, Jeffrey felt a tap on his arm. He turned to find three Korean women standing before him, each with a head of cabbage in her hands. Jeffrey does not speak Korean, and the women did not speak English, so the women bowed at Jeffrey to offer thanks. In return, he bowed to the women. As they were bowing to each other, Jeffrey was thinking to himself, "It's only cabbage." As he looked at their faces, something like an epiphany came over him and he remembered thinking: "It's not just

cabbage. It's kimchi. It's stir-fry. It's soup." The women knew how to get every ounce of goodness and nutrition out of this cabbage.

Ruth. Almost four decades ago, when Ruth was 19 years old, she worked as the lake director at a Girl Scout camp in northeastern Pennsylvania. She lived in a platform tent beside the lake and a distance from the other staff tents. Ruth recalled feeling scared of being by herself, but over time she became more comfortable. Her profound experience occurred one night after everyone in the camp was asleep, when she paddled a canoe to the middle of the lake, threw down anchor, and slept beneath the stars. She described the experience as "the most amazing thing in the world" because she felt protected, safe, and one with nature.

Nicholas. A little over two years ago, when Nicholas was 30, he was looking out his dining room window at his backyard. He saw a hummingbird hovering over a hosta blossom. Nicholas vividly remembers the way the scene looked: the sun, the dew on the plants, and the hummingbird. He had been going through a difficult time in his life, and seeing the hummingbird at that moment put things in perspective. In that instant, he became overcome with a powerful wave of happiness and realized he needed to be happy with his life, instead of lingering on what was not going well for him. Nicholas committed to stop drinking and get his life together. He is now on a path to a healthy and happy life, which he attributes to seeing the hummingbird.

Jonathan. About 26 years ago, when Jonathan was in college, he was asked to give a tour of the scout camp where he had spent much time as a youth. This was a regular occurrence for Jonathan as he often gave tours of the camp in his role as a scout leader. On the day of his profound experience, Jonathan's group was traveling south to north, crossing over the Mason-Dixon Line. He recognized signs of the forest progressing from a southern mixed hardwood to a northern mixed hardwood. This realization struck Jonathan because he was in the midst of a

forest ecology class. In that instant, he was able to see the whole forest and how it was connected to everything else, what he calls integrative seeing.

Julie. Over two decades ago, when Julie was 16 years old, she participated in her first overnight camping trip as part of a teenage ecology workshop. She recalls pitching her tent in a bed of ferns and feeling surrounded by nature. While she was with a group of other teenagers, Julie felt as if she had escaped the "rat race" of SATs and college applications. She sensed connected to what was around her and the other campers. During the trip, Julie began to gain a sense of self-reliance and learned how to immerse herself and be present in the natural world. It was during this trip that Julie decided she wanted to devote her life to bringing people closer to nature.

Hope. In 2007 at the age of 36, Hope was scuba diving off a small island near Sipadan, Malaysia. She was about 20 feet underwater when she saw a flutter in the water. Upon closer inspection, Hope realized she was within five feet of a giant cuttlefish. The cuttlefish was perfectly camouflaged at one point, but then its color started to change. Hope stopped moving and stared at the creature. She was mesmerized by the sight before her eyes and felt chosen by this creature. She thought it was one of the most beautiful things she had ever seen and felt as if she was staring into the face of God.

Stephanie. Stephanie's profound experience with nature occurred thirty-five years ago when she was about eight years old. The experience was one of countless adventures exploring undeveloped areas in her neighborhood. She reminisced about time spent with neighborhood friends, building forts and treehouses, searching for critters under rocks, and engaging in imaginative play during which branches became magic wands and leaves were used as a form of currency. The incident she considered profound took place when she was alone in the woods.

She felt peace and deep connection to the world around her as she interacted with trees, plants, soil, and animals. These forest dwellers were her friends, and she recognized that they were alive and that all of nature was interconnected.

Kyle. Twenty years ago, while in his late twenties, Kyle thru-hiked the Appalachian Trail from Georgia to Maine. When he started on his journey, his goal was to take a long walk to escape the negativity and anger he was feeling, both toward and from people, related to his work with red wolves conservation. What Kyle did not realize until he started walking was that his successful completion depended on the kindness and generosity of others. The most profound aspect of his experience was that in trying to escape the human species, he instead found his hope in humanity rekindled.

Michelle. When Michelle was an undergraduate student, she participated in a nesting wood turtle research project in Nova Scotia, Canada. The research site was the northern limit of the wood turtle range and located on private property. The owner allowed researchers to use the area, but he did not care about the turtles. Out of fear the turtles would find entry into his home, the owner would often kill the turtles as he mowed his farm fields. Michelle and her coresearchers found it challenging to explain the importance of the turtles to the landowner. This experience was the first time Michelle confronted the human dimension of natural resource management. As a scientist, in the past she was data-focused; because of this experience, she realized the need to acknowledge and incorporate the human aspect of environmental science because without it, her work would be futile.

Melanie. Melanie had managed to go her whole life without learning to swim. Although she enjoyed playing in the water, her fear of putting her head under the water led to panic attacks. Never learning to swim was something that affected Melanie deeply because she often

felt like she was missing out. Over the years, any time she was in a place with a pool, she would try to go under the water and inevitably fail. Two years ago, Melanie was in a pool with her husband discussing her fear of submerging her head. At her husband's suggestion, Melanie took a deep breath, exhaled, and found herself under the water. It was a moment of 'pure ecstasy.' Melanie felt one with the water and all elements of nature. Learning to swim at age 49 gave Melanie a new take on life, a new sense of confidence, and determination to try new things.

Erin. Almost ten years ago, after graduating from college, Erin took an internship at an organic farm to be outside and do something real with her passion for biology and ecology. When she arrived at the farm in May, she was awestruck by the beauty of her surroundings. It was a small farm and she recalls the owner putting so much care and detail into managing the farm as well as the interns' training. Erin described the experience of living and working on the farm as "paradise in every way." The experience of working the land provided Erin with an opportunity to learn about herself, work with diverse people, and become intimately involved with and knowledgeable about the food that nourishes her body.

Ashley. When Ashley was ten years old, she was riding in her parent's car along a major interstate on her way to her grandmother's house. Sitting in the back seat, she looked out the window and noticed trash thrown on the side of the road. Ashely was saddened by the trash and wondered why no one was collecting the litter. She remembers it as the first time she ever associated negative human impact with nature. At that moment, Ashley decided she wanted to clean up the trash herself. Now, 26 years later, she is a director of stewardship in which her responsibilities include organizing trash cleanups in the local watershed as well as eradicating invasive species from local ecosystems.

Lindsay. Ten years ago, at the age of 22, Lindsay was in Hawaii for her last semester of a graduate program in which she traveled around the country studying the local people and land. While on the island, she was learning about the Hawaiian people, their culture, and their view of the land as alive and conscious. Near the end of her time on the island, Lindsay visited Mauna Kea, a dormant volcano and the highest point on Hawaii. While stopped at a visitor center, Lindsay decided to explore a nearby hill where she encountered a park ranger who told Lindsay not to take any of the rocks, even if they talked to her. From Lindsay's Western perspective, she thought his comment was odd. As she walked toward the hill, all of her previous experiences on the island began rushing through her. Lindsay realized on a visceral level the world around her was alive and that she was feeling love for the rocks. It felt so natural, beautiful, and life changing. It was another layer of connection with the land–a profound layer.

Chad. On a fly-fishing trip to the Connecticut River 15 years ago, 26-year-old Chad saw a small buck near the water. He wanted to capture the moment with his camera and slowly moved closer to the deer. When Chad was within a few feet of the deer, he and the deer made eye contact and stared at each other for a long time. Something inside Chad urged him to get even closer. The buck, instead of running away as Chad expected, stepped closer to Chad. The two were now arms-length apart and Chad instinctively reached out his hand and touched the deer's snout. He remembers the damp coldness of the deer's nose, hearing the deer's breath, and smelling a strong musk scent. Chad felt connected to the deer as they stared deeply into each other's eyes. The young buck leaned forward and licked Chad's hand with his rough tongue.

Susan. Susan's profound experience with nature happened five decades ago. From a young age, Susan was emotionally abused by her mother. By the time she was a teenager, she often ran away to avoid her unhealthy home environment. Susan was referred to a state agency,

which placed children in foster homes. Her claims of abuse were initially dismissed, but eventually compelling, evidence qualified Susan for voluntary placement in a foster home. At 14 years old, Susan struggled with the decision of whether she would be better off in a foster home. One day, while in a social worker's office, Susan had a vision of walking by a gurgling brook in the woods as rays of sunshine filtered through the trees. She found herself thinking that the only way she would ever experience the peace and serenity she felt in that vision as if she escaped her mother's emotional abuse. The image was pivotal for Susan as she felt a sense of strength, courage, and confidence, and in that instant, decided to leave home.

Mary. As a child, Mary and her family would travel to Vermont to visit her grandmother's farm. Each day the children were sent outside to explore the natural world, gathering together at lunchtime on a large boulder, called "the rock," in one of the fields. When Mary was nine years old, she was big enough to climb onto the rock herself. Mary would lie on the rock, spread out her arms, and gaze at the sun and clouds above her. For Mary, the rock was safe, warm, supportive, and expected nothing from her. One day, Mary wondered what it might feel like to be a rock. She laid on her back, closed her eyes, and felt herself go into the rock. When in the rock, she could see the crystalline structure, feel the coldness, and sense the darkness. Mary believes she became the rock. It was a part of her, and she was a part of it. This incident occurred almost 50 years ago when Mary was eight, but to this day, she still visits the rock during meditations and in her dreams.

Kim. Ten years ago, at the age of 42, Kim and a friend were hiking in Yosemite National Park. As they entered Mariposa Grove, Kim felt awe in the presence of the giant Sequoia trees. She experienced peace and recognized the uniqueness and specialness of the place. She recognized a strong desire to pass on her love for the natural world to her children so that they

too, could have a reverence toward nature. The most impressive revelation for Kim was the age of the trees: older than the history of the United States and the great pyramids in Egypt. Kim realized how insignificant humans are in the grand scheme of life and that nature keeps going whether humans are present or not.

Tracey. Tracey spent years working in trauma and surgical critical care medicine. She would travel the world training doctors on the latest medical drugs and protocols. On a trip to Africa about ten years ago, Tracey was field testing the effectiveness of a newly developed blood substitute. While standing outside, a little boy walked over to Tracey and politely asked if she was American. When Tracey replied, "Yes," he responded with, "Oh. You're rich. You pee in your water," before running away. That moment was a reality check for Tracey. Tracey knew the little boy was correct and immediately realized she had taken so much for granted in her own life. Saddened by the thought that this is how people in less-developed countries view the United States, the words of the boy struck Tracey. At the age of 50, with this memory in mind, Tracey began to make drastic changes in her life and follow her passion for protecting the environment.

Each profound experience described above included a specific point of interest or focus. This focus served as a source of inspiration or connection for the individual. The focal point of the experiences can be categorized into three types: a living entity, a non-living entity, or a specific place. Table 3 displays the main focus of each of the recounted profound experiences.

Table 3

Main Focus of Profound Experience with Nature

	Bridget	Ants
	Hope	Giant cuttlefish

Living entity	Joseph	Baby birds
	Tracy	Young boy
	Jonathon	Trees
	Nicholas	Hummingbird
	Michelle	Wood turtles
	Jeffrey	Cabbage
	Kim	Sequoia trees
	Chad	Deer
Non-living entity	Tina	Book
	Lindsay	Volcanic rocks
	Ashley	Trash
	Melanie	Water
	Susan	Image
	Mary	Rock
Place	Erin	Organic farm
	Stephanie	Abandoned fields and woods
	Kyle	Appalachian Trail
	Julie	Campsite
	Ruth	Lake

Impacts of a Profound Experience With Nature

The impacts of the profound experiences with nature that participants recounted for this study were unique and personal for each individual. Commonalities were evident among the experiences and were woven into four themes using Braun and Clarke's (2006) thematic analysis. Table 4 describes the four themes that emerged after inductive analysis: becoming authentic, changing social relationships, living with meaning, and reliving the past. The table also includes the composite description of each theme that was used to fine-tune the described impacts of a profound experience.

Table 4

Final themes and composite descriptions

Themes	Descriptions
Becoming authentic	Developing a sense of self-empowerment; shifting one's values, sense of truth, or meaning in life; expanding one's spiritual beliefs and recognizing the possibility of a greater existence or universal truth
Changing social relationships	Changing how individuals relate with other people, living beings, nature as a whole, and inanimate objects found in the natural world
Living with meaning	Consciously considering daily choices, directional life changes (academic plans and career paths), and major life-changing transformations
Reliving the past	Memory has become a part of the individual and guides every decision and behaviors; memory is kept in the back of the mind and tapped into when needed

Figure 1 displays the impacts of a profound experience with nature using the four themes generated during analysis. It further defines each theme to further demonstrate the effects described by the participants.

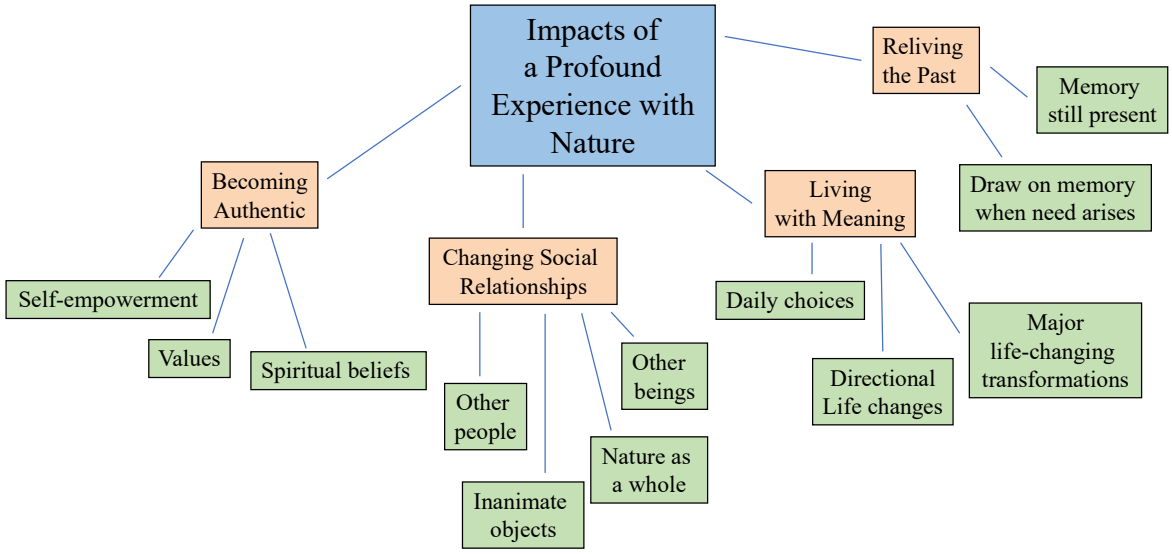


Figure 1: Described impacts resulting from a profound experience with nature

Becoming authentic. Individuals recounted how their experience helped them gain a better understanding of who they are, more aligned with their true nature, core values, and beliefs. Authenticity manifested in three ways: developing a sense of empowerment, reprioritizing values, and expanding spiritual beliefs.

Sense of empowerment. Eight participants felt a new sense of self-agency after having a profound experience with nature. The participants used words such as 'proud,' and 'validation,' or 'turning point,' and 'you can do anything,' or 'you can learn anything,' to describe how their profound experience instilled in them the confidence and courage they were previously missing. For example, Erin felt proud for deciding to intern at an organic farm after completing her undergraduate studies despite pressure to find a high-income job. She stated,

> When you graduate college there's a lot of forces in play to try to make you make the next step. What people want it to be, whether it be from your parents or society and I just decided that that was what I needed to do in my path. And I did it.

Similarly, Jonathan's confidence in his ability to apply what he was learning in his undergraduate education was solidified after seeing the transition of tree species in the forest. He stated that his experience "was just very transformative for me because it was a validation of my education, which was exciting… suddenly gaining the confidence in my own skills."

One participant discovered the ability to be comfortable on her own in the natural world. Michelle had never liked to be alone, preferring the company of others. But while participating in the turtle research project, Michelle would spend 10 to 14 hours a day outside by herself. She reflected on how it affected her,

> I had to learn to be alone. I think there was some surprise that I was okay with that and that I could just enjoy nature and enjoy the scenery and enjoy the turtles. It was actually very peaceful… I feel like that was a big turning point, learning that I could be by myself and be okay. Be alone with my thoughts.

For some participants, a profound experience with nature created in them certainty and assurance in who they are, their strengths, and their capacity to succeed. Ruth gained self-confidence after sleeping alone in the canoe. She remarked

> I think there's certain things that help you to feel like you can do anything that you want to do and that there are no obstacles. I think that that actually probably was something whether that perceived risk just made me feel like you know now I'm a real outdoors woman. I'm sleeping by myself in a canoe on a lake… to know the importance of being alone in nature and knowing that I could be alone in nature would be okay.

Julie's first time overnight camping is the basis for her sense of self. She stated, "I just kind of feel like it somewhat defines me as a person… It's like, I had this experience. I'm richer for having that. This is part of me now."

Learning to swim at age 49 gave Melanie the confidence to try other things such as playing the piano. "It literally showed me that you can learn anything or change something that you think is pretty deeply entrenched at any time and that is a really good thing to know."

For two participants in the study, their profound experiences changed their entire lives. Both were living in unhealthy situations and their profound experience with nature gave them the confidence and courage to change. Susan knew instantly, and with complete confidence, the course she needed to take to escape the emotional abuse at home.

> It was such a moment of clarity for me. It was decisive. Nothing else did it for me. I'd been going weeks to see this social worker and I could not decide. Then it almost was visited on me, this image, and then it was clear… I still remember it crystalline clear that feeling of, "I'm out of this paralysis." It freed me. It was such a good feeling."

Nicholas's profound experience was also life altering. As he watched a hummingbird hovering, he immediately knew he needed to make changes in his life. He stated,

> I think it definitely compelled me to get my life together. I don't want to make it sound like my life was falling apart. My marriage was good, I left my job on good terms… But I just think sort of what I mentioned my mental health and emotionally... I do think it ... specifically regarding the drinking, I did make a conscious decision to work on that.

Values. Two experiences described in this study also prompted individuals to consider and reprioritize their values or guiding principles, placing more priority on nature and less on

themselves. For example, Jeffrey's cabbage experience resulted in an awareness of his skewed priorities. He stated,

> This is gonna start with what I think of as ego. For me, my sense before this [experience], my sense of value, my sense of worth came from what I accomplished, what my legacy was. What came out of this was that was completely wrong. My sense of value, your sense of value, every human being's sense of value, the mere fact that they were born, they have intrinsic value. To come to that understanding, especially as it relates to the idea that healthy food is a right, not a privilege. It is more like a religion. Like I said, I'll never look at an apple the same way.

Tracey also realized she undervalued nature after the little boy she encountered spoke those few words to her. She recalled,

> I think it is taking [nature] for granted, right? Taking things for granted. And even myself, who I consider myself an environmentalist, hadn't even thought about that perspective. That, "Okay, wait a second. Yeah. I'm peeing in my clean water."… I just took it for granted. Went out my front door, my back door, didn't matter. There it was all for me. But now realizing that that's not the case, and even in my hometown it's not the case anymore… It kind of pushed me to do that action.

Spiritual beliefs. Four participants' sense of self was reinforced in response to a change in their beliefs. After having a profound experience, these participants felt a shift in their sense of truth and certainty about the possibility of some higher existence or meaning in life. Participants who spoke of this effect expressed how before the experience, they considered themselves not very religious or spiritual or for some, even agnostic. After a profound experience with nature, these participants felt open to a belief in something more.

When Hope made eye contact with a giant cuttlefish, it challenged her disbelief in a higher power. She reflected,

> But it was this experience of ... And for me this was profound because I grew up ... I've always grown up sort of agnostic, more on the agnostic side when I was younger, atheist… But I felt like I was staring into the face of God.

Hope reiterated how the experience reinforced an underlying belief she had. She continued,

> But this cuttlefish was just so remarkable. And it created just a sort of a belief in some ... Not in any kind of Jewish or Christian or Muslim God, or any other God. It was nothing like that. It was really just this sort of reminding me of my deep belief in just the healing nature of the earth.

As Kim walked among the giant sequoias, she acknowledged the possibility of a greater power. She recognized her place in the world and the significance of all life. She pondered,

> I was never really religious before and I think that when you see something like that it makes you realize that there is the possibility of something else out there that is controlling things… and whatever you call your God or whatever, Mother Nature it made me realize again that there probably is some kind of greater meaning and reason for us being here, rather than us just being born and dying…It was just absolutely amazing and spiritual. It made me realize how insignificant humans are and that nature keeps on going whether we're here or not.

Likewise, Mary's experience on the rock helped her understand the meaning of God. She reflected,

> So, it [the rock] was my friend. Safe, warm, supportive, no expectations. This was huge about The Rock for me as a child. No expectations, just supporting me, asking nothing in return, and I need be nothing for it. So, I understood a greater understanding of faith than what was being taught me of what a god could be than was ... God in the Catholic church, I was brought up Catholic, was more of needed anger management at times, as opposed to a rock who just was there for you at all times.

Jeffrey's spiritual beliefs increased after giving cabbage to the Korean women. He acknowledges that the experience saved him emotionally and spiritually. "It's a spiritual thing. It's healing. It's healing for me personally. If I didn't have the farm to sustain me both emotionally and spiritually, when I had my breakdown, I don't know what I would've done without them."

Changing social relationships. Participants also described how their profound experience with nature enriched their relationships with others. Participants described feeling either more distant from or more connected with other humans, or closer to an individual animal, nature as a whole, or an inanimate object in the natural world.

Other people. Two profound experiences recounted in this study gave rise to a deeper sense of connection with other humans. As Kyle hiked the Appalachian Trail, his hope for the human species was rekindled. He recounted, "There were little lessons all along the way that showed me, no, don't give up. There are good people out there. That was the biggest thing I took from it. I was giving up on the human race and the trail definitely encouraged me to not."

Kim was so moved by her time among the giant sequoias that she realized the importance of sharing her love for nature with her daughters. She stated, "It's made me realize that we're just

a small part of nature and that I need to pass that on to my children so that they have a reverence toward nature and our part in taking care of our world."

Interestingly, three participants in the study spoke of how they felt a disconnect with other humans after their profound experience with nature. Eight-year-old Joseph realized that not everyone had the same empathy for nature as he did, after finding the bird's nest destroyed by the older kids. He recalled, "But there was that one theme emerged… it was me and nature against the friends sometimes."

Stephanie spoke of how feeling connected to plants and animals in the forest near her home helped her recognize the vast differences in how she and others choose to live. She stated,

> When I see the way other people live I have to think that original experience contributed to how I live my life. That original experience that I had, that original connection, that original love… that's why I get angry when people destroy it [nature].

Hope also described how her relationship with other people changed after her time with the giant cuttlefish. She compared how she felt before and after her experience,

> I am less tolerant, but I've always been intolerant, of people hurting animals or being destructive to the earth, whether it's littering, whether it's not recycling, whether it's using pesticides and things like that. If anything, it's made me even more intolerant of what we're doing to our oceans.

Nature as a whole. Each participant's view of or relationship with the natural world changed as a result of their profound experience. The changes experienced by participants include remembrance of an underlying love for nature, a different way of interacting with and greater appreciation for the natural world, an overall deepening in their relationship with the natural world, a desire to spend more time outdoors, a loss of fear in a natural setting, and a

recognition of the interconnectedness of all living beings. For example, after his experience with the hummingbird, Nicholas simply stated, “I think it sort of reminded me of that passion I have for the outdoor, natural world.”

Chad described how interacting with the deer changed his approach toward wildlife. Where once he had a competitive attitude, he now has a greater appreciation for nature. He declared,

> [The experience] definitely changed how I approach wildlife and appreciate wildlife. I wouldn't say significant because, again, I've always appreciated and enjoyed wildlife, but before I feel like it was more of a prize and now I feel like it's more of not something I need to hang up on my wall, but something to appreciate. I think that's a change.

Stephanie described feeling more reflective when in nature because of her experience in the abandoned fields and woods near her childhood home. She recounted,

> And now, when I'm out there it's changed in a way where I'm more contemplative, I reflect more. I don't think I reflected back then, I just did. When I was younger there was no stop, think, enjoy and smell. And if I did do that stuff it wasn't intentional. It was just like I needed a breather. But now it's more intentional to soak it all in.

Kim is more attentive to nature after spending time among the giant sequoias. She stated, **“**I think that I probably pay more attention to the connection of humans and nature. I guess that would be the main thing that I do.”

Jeffrey described feeling more aware of his previous actions toward the environment, and those of others, after his cabbage experience. He stated,

> I think more of the way I look at it, the way I view our environment, the way I view nature… I didn't realize the long term, negative impacts of what some of our practices were on nature. So today, I'm a lot more aware and a lot more vocal.

Four participants described a deeper relationship with nature after their profound experience. Reflecting on her experience with the giant cuttlefish, Hope said, "I think it just deepened my relationship with it. Deepened my ... I have a thing where when I dive, I namaste every critter… as a thank you. But yeah, I think it just deepened it." Similarly, Tracey spoke of how her relationship with nature changed after hearing the little boy's comment,

> I think it has only deepened, honestly. Because I did feel that really good connection with Earth always, but now I think it's deepened from my experience, knowing more. It's just deepened that even more and it's made me feel like an advocate… like I've really become an advocate for Mother Earth.

Likewise, Susan recalled her vision of a calming nature scene and reflected, "It [my relationship with nature] became much deeper. It became part of my blood. That's the only way I can describe it. Nature became part of my blood. It's like something you can't live without."

Lindsay described similar sentiments after her experience with the volcanic rocks. She said,

> It's given me this excitement about the natural world. And this feeling of playfulness with the natural world. I feel like my relationship with nature is more playful, and more loving... More like I can bring some of the emotions that I feel towards humans into it. In the sense of like, like I said love, playfulness.

Other participants spoke of the desire to spend more time outdoors after their profound experience. Michelle learned to enjoy alone time in nature and stated,

> I think I sought out nature a little bit more often, seeking as a place of peace and quiet and things like that, afterwards… I think that after that experience of just being able to enjoy being on that nesting beach and things like that, I would go out to seek that again, just to have that peace and quiet.

After her first camping trip, Julie yearned for more outdoor group experiences. She explained,

> But that kind of craving for another immersive experience kind of stays with you. And again, craving to be in a group where you have other people seeking the same and what you can learn from each other in that kind of environment.

Two participants spoke of a loss of fear after their profound experiences. Ruth reflected on sleeping in the canoe, "…knowing that I could be alone in nature [and] would be okay." Likewise, Melanie reflected on how learning to swim made her less afraid of water,

> Oceans and quarries have this sort of dangerous and completely unknowable quality to them… and this feeling of like well, that's okay, I can still jump in… and my relationship to those types of water environments has changed completely.

Participants reported an interconnection to all of nature, manifesting as a recognition of the natural world as alive and made of energy, and as viewing the world with open eyes that see the invisible connections. This was demonstrated by Tina, who stated, "It was just a different way of looking at it…We're all kind of the same stuff… Everything, then we're all interconnected. So, there is that bigger sense that we're all one body kind of one." Reflecting on her experience of watching ants, Bridget shared, "I think it just helps me realize that we're interconnected with other living things. And my perspective is really interconnection of people and nature." Similarly, Jonathan's integrative view of the world stemmed from his experience of recognizing changing tree species along the Mason-Dixon Line. He described his view as "to

look at things in a very integrative way. It's very difficult for me to separate things out and my approach to just about anything is looking at all the different connections." Likewise, after working on the organic farm, Erin took a larger view of the world and saw connections as evidenced when she stated, "I think I can still see ecosystems being productive and biodiverse and healthy, for lack of a better word…even with some human intervention."

Objects within nature. Three participants expressed feeling connected to another creature an inanimate natural object after their profound experience with nature. For example, Chad's experience with the deer was a connection with a wild animal like he had never experienced before or again since. He said, "I had that knowledge that day, that moment, 'Wow, we're connected, we're certainly on a very much awesome level. We're connected, this deer and I.'" Lindsay's experience with the volcanic rocks was visceral and life changing. She recalled the exact moment she felt love for an inanimate object,

> As I was walking, I was looking around, and I just started to get that feeling in my heart that I get with other people, but it was happening with the rocks… But to me, it felt so natural. I've been missing out on this feeling of another layer of connection with the land. When I think of profound, that's what it is… a layer of that profoundness.

Mary ponders whether she can become one with the natural world again as she did when she became the rock. She shared,

> I entered into that rock however one might experience a rock, but sometimes I feel like the trees bow down to me because if I can be in relationship with a rock, I can be in relationship with a tree…So, I think that because I had a relationship with a rock, I more so enjoy the relationship of the fact that other things, I might be able to enter into a tree.

Living with meaning. A profound experience with nature was the impetus for change for every participant in this study. Common to all participants was a desire to live a more meaningful life after their profound experience. Participants often consider the consequences of their choices and contemplate how their decisions will affect themselves, others, and the planet. The profundity of the experiences encouraged participants to live a more authentic life in which they felt more responsible and in control of their actions. The changes spanned the spectrum from daily lifestyle choices to more life-changing transformations.

Daily choices. Participants described how their profound experiences influenced their shopping habits, resource use, and free time. Describing how she purchases food, Erin reflected,

> Definitely since then [her time on the organic farm], I'm obsessed with buying local food, and I love going to the farmers' markets and talking with the farmers... But the shopping thing for foods that I thought would align with my vision of ideal working conditions.

Bridget also spoke of the importance of meeting farmers and understanding where and how her food is grown. She stated,

> When I go see farmers, I don't like to go to farmers who are grumpy. I like to go to the farmers that are happy farmers. And to me, their relationship to the earth is really important… how they relate to people is their relationship to how they relate to their product.

After the cabbage experience, Jeffrey expressed how he is more mindful of food choice and food waste. Referring to his lunch leftovers, he said, "This has to go home with me even if I feed it to a pet. I can't let it go into a dumpster. That's a whole new, like a whole different way of processing."

Other participants described altering resource use after a profound experience with nature. Julie spoke of making a shift from convenience behaviors (using a plastic water bottle and throwaway coffee cups) to more mindful behaviors after her camping trip. “Most the time I do have a reusable water bottle with me and, when I go to conferences and stuff I try to bring coffee mugs and things like that. I compost now.”

Likewise, Stephanie has become passionate about understanding how her lifestyle affects the sustainability of the planet and shares her knowledge with her loved ones. She stated,

> From just my daily life, from recycling to educating family and friends. Not just for work, but educating family and friends about certain products and voting with their dollar and ingredients and organics and GMOs and my personal research and reading constantly about consumerism and the choices that we make daily.

Kim recognizes the need to use resources more wisely for the benefit of nature. She said, “And personally, I'm now more careful about recycling and taking care of animals and plants.” Susan described actions she takes now, while also recognizing the need to do more. She stated,

> I feel reverent about the environment. When I'm on my walks, if I see trash or garbage, I'll pick it up and I'll save it until I get out and have a place to recycle it, and I recycle here at home. I try to conserve energy. I should do more. I should do more, make more organized efforts to do stuff about the environment, but I try.

Participants also reported changes in how they spend their free time after their profound experiences. These changes included engaging in more outdoor activities, reading about environmental topics, volunteering for environmental organizations, and becoming more politically active.

Susan described seeking refuge in nature, which began with that first image of a calming nature scene. When dealing with issues related to her son she said,

> He had very different issues, but my means of coping with his very abnormal development was to walk and walk and walk and walk and walk, miles and miles a day and just soothe myself with nature. I don't know what I would've done without those walks.

Melanie craves more time in aquatic environments after losing her fear of water and learning to swim. She said, “It's like I've got to have water. I didn't think of it as something I needed and so now whenever we make plans or have a special treat it usually involves water.” Ruth sees her experience of sleeping on the canoe as a “catalyst for other moments” and outdoor adventures she pursued in her life. She described participating in an Outward Bound program, becoming a canoe instructor, studying with a boat builder and building her own canoe, and venturing to a remote part of India to learn about the relationship between spirituality and the forest.

Stephanie described how she and her family spend as much time outside as possible. She stated,

> That's my go-to. If I have any time, we go in the woods and play. That's what I do with my husband, with my dog, and with my son. Or with any friends that want to tag along that particular weekend. That's what we do, when we get home from work, we go outside and play… But on the weekends, that's our play on the weekends too.

Michelle’s turtle research project resulted in her seeking peace and solace in nature. Like Stephanie, Michelle chooses to spend this time with loved ones, including her fiancé. She remarked,

> We both love hiking and just enjoying nature. I think that's definitely something that is one of the things that is important to our relationship, as well, so we make time as often as possible, especially on the weekends, to go out and go hiking and things like that.

Julie has made outdoor recreation a routine part of her life since her initial overnight camping trip. She participated in a 10-day canoeing, meditation, and yoga Outward Bound adventure with other women and commented, "And I don't think I would have done that experience had I not had the previous one."

Other participants have engaged in activities that are less recreation based, but nonetheless are environmentally focused. After reading *13 Original Clan Mothers*, Tina is encouraged to read more about the natural world and volunteers for her town's environmental commission. Likewise, Kim began to read nature-themed books after her time among the giant sequoias. She said, "I think that some of the things that I choose to read are more environmental and learning more about some of the early ideas about nature and our connection with it."

Jeffrey spoke of how his cabbage experience inspired him to become more politically active. He said, "It helped me refocus. Within Rolling Harvest there was a tendency to not be involved as a political activist. That's changed dramatically… After the cabbage incident, it's extremely important to [become politically involved]."

Directional life changes. A profound experience with nature resulted in eleven of the participants (52%) experiencing a directional life change, whether related to an academic path, a career track, or a more significant life transformation**.**

Michelle's academic plans headed in a new direction after the wood turtle project. She stated,

> I didn't really even know that this field existed until I found this posting, and I was like, "That's what I want to do. That's what I want to focus on." … So, even though it wasn't something that I really knew was going to change the path of my life and my career and things like that, that's really the experience that ended up changing what my career path, slightly. It's still in the environmental field, but more the outreach side versus the hard science of measuring turtle egg type of thing.

Bridget also attributes her experience with the ants to the academic path she chose more than a decade later. She reflected, “It's kind of made a trajectory of me and nature; And I studied it, I had my Ph.D. in it and ... it kinda has set me into like this particular direction.”

Tracey spent most of her working life in the corporate world. After her profound experience with nature, she decided to follow her passion and return to school. She reflected,

> So, my profound Africa, that little boy saying that to me and how it really allowed my life to unfold not very long after that. So, I can say it was about two to three years after that, he made that statement to me, and once I was back in the U.S., that I decided, ‘Okay, I'm going for this.’… And so, at 49 I went back to school, I entered academia again. I entered Vermont Law School.

Similarly, Chad believes his decision to attend a particular graduate program stemmed from his encounter with the deer. He stated,

> The time that I read that [program description] was after that deer experience. I think I gathered from the description of ETL [Ecological Teaching & Learning] that that was the magic that I had experienced with the deer experience and I wanted that. So yeah, I think it has somewhat influenced my path in life.

As Hope was reflecting on her experience with the giant cuttlefish, she suddenly realized its role in her attending her chosen Ph.D. program. She reflected,

> I can't help but think that there's something about this experience that made me choose the PhD program I went to… I knew I was going to do my PhD. I didn't know where, but I only applied to one school. And it's a Jungian, it was a school that's really focused on Jungian psychology. And I think that because of this sort of experience of God, so to speak, I was more open to go into a school that was Jungian focused.

A profound experience with nature also affected the career track participants pursued. Participants described how their profound experience solidified their career path or was the inspiration for a career change. Jonathan's recognition of the changing ecosystems at scout camp cemented his decision to work in parks and recreation. He recalled,

> I guess that [experience] excited me more about a career path that I was choosing, of being able to apply those skills and look at something in that kind of detail... it definitely solidified the career path I wanted to take.

Seeing trash along the highway was the impetus for Ashley's future career in land stewardship. She reflected,

> I'm still here working on trying to fix properties and such... now it's starting to come to full fruition if you think about it. Now I'm stewarding the environment trying to remove the trash and the unwanted items, or making it more ecologically sound for the good of all of the creatures.

Kyle's time on the Appalachian Trail encouraged him to consider his future career choices. He remarked,

> It's definitely showed me that you don't have to have a normal job. You can do what you love to do…You can follow your dreams and be okay. That's what I took out of it. After the trail, I was like how can I go back, how can I ever even think about going into an office and working? That's not what I wanted.

Julie knew immediately the career path she wished to pursue while on her first overnight camping trip. She said, "And I think at that moment I thought, 'All right. You know, maybe I'll be a park ranger or maybe I can do this as a career.' And, and essentially I have." The interactions with the landowner during the wood turtle project fascinated Michelle and ignited a desire to focus on the human dimensions of natural resources as a future career. She stated, "I think it really changed my career path and what I ultimately wanted to get out of my career. That desire to make a difference."

Tracey's profound experience planted a subconscious seed in her mind, which grew until she decided to go back to school and start a new career in the environmental field. She said, "That little boy planted a seed. It took me a couple years to get to where I am now. I made the change now, and wow, look at this path. It's still wide open." Interestingly, while Mary was reflecting on her profound experience with the rock, she made a connection between the event and her future career as a physical therapist. She remarked,

> I'm also a musician, but when I made the decision to become a physical therapist, I needed something that I could support myself with and I said, "People may love the flute, but they're not always going to pay for it, you can't make a living on it." So, I said I needed a rock-solid career, so I can use in my language. To be a physical therapist was like a rock because people are always going to get sick and I would always have business.

Significant life transformation. For two participants, their profound experience with nature significantly affected their entire lives, signifying a fresh start and an escape from a negative environment or destructive behaviors. Nicholas was at a point in his life where he was using alcohol to self-medicate. Watching the hummingbird was the motivation for getting control of his life again. He reflected on that difficult time,

> I would say it affected my behaviors towards myself...I had definitely been drinking too much, and that was sort of a ... I don't want to use the expression moment of clarity, because I don't think it was quite at that level where I had just been totally inebriated all the time. But it was ... basically if you think you're drinking too much, you are...I can admit, I definitely was. And I think it [seeing the hummingbird] definitely compelled me to...get my life together.

For Susan, her profound experience gave the clarity and strength she needed to escape her unhealthy home environment and enter foster care. “Then this image comes and it's clear to me what to do and it was such a vast relief. I remember the feeling associated with it to this day, that now I know just what to do.”

Reliving the past. Participants described how the memory of their profound experience with nature is still present within them. For some participants, the experience has become a part of them and guides every decision and their behaviors. It is called on regularly by these individuals. Others keep the memory of their profound experience in the back of their minds and tap into it when required it. In both cases, the memory of the experience acts as a guiding light. The experience is a fixed part of the individual and influences his or her everyday life. Participants describe drawing on the memory of their profound experience with nature when they need to remind themselves of the feelings associated with the initial experience. They do this in

times of mental stress, when they need to feel encouragement, confidence, or courage, when they are making decisions, and when sharing the memory of their experience or their love of the natural world with others.

In times of stress. Three participants described reflecting on their profound experiences during especially stressful times in their lives. They harken back to the experience and draw upon the initial feelings to calm themselves, put things in perspective, and find strength and clarity. These participants use the memory of their profound experience as a mental retreat and a reminder to slow down and be present in the moment.

Hope described the times she reflects on her experience with the cuttlefish, “I think that it is something I can actually tap into when I'm needing that reminder to be present, to just be in that silence.” Nicholas uses his memory of watching the hummingbird when he feels stressed and begins to lose perspective. He stated,

> It's a very happy memory...it's sort of something that I can, that I use to try and calm myself...I'm one of those people, I'll get flustered. I worry a lot... it's just a very peaceful scene. It's a very peaceful place.

Mary spoke of how she ‘visits’ the rock regularly through meditation when she wants to feel safe. She stated, “So, today I go to The Rock regularly at any time I want, and I look out...It's a haven where if I'm feeling overly stressed, I go to my Rock in my safe haven.”

Encouragement. Four participants described using the memory of their profound experience when they need to feel motivated and inspired. The memory is the stimulus that gives them the courage and propels them to act, especially in times of self-doubt.

Ashely described how the feelings of seeing the trash on the side of the highway guide her today when she starts to feel a little lost. She said,

> So of course, crazy mind is always here, here, here, here, here, but sometimes that feeling would always come back to me when I was in the car backseat driving on those busy roads going, "Ah." That reminder, as in, 'You know, I should do something about that'.

Tracey's profound experience was a wake-up call that propelled her to act. She said, "I think coming to that realization with that boy's statement, and then, wow, now I'm gonna create some action to help resolve the situation. So, it's allowed me to act. It kind of pushed me to do that action."

Melanie uses the memory of learning to swim to remind herself that she is courageous and can try something new,

> Especially, as you're approaching 50 as I was, I think maybe there was a feeling of like well that ship has sailed and there are a lot of ships that seem like they've sailed at that age...Okay. There are other great things, that's fine, don't need that, but suddenly it makes you look and say wait! What are the other things that I maybe thought I couldn't do?

Similar to Melanie, Ruth's experience of sleeping on a canoe gives her confidence and strength to push out of her comfort zone. Thinking back on her experience, Melanie said,

> When you can draw on those kinds of experiences, I think on some kind of subconscious level, you can draw on those experiences that make you feel strong. And you can remember. Like in that moment, you create a feeling for yourself. And you can mentally return to that feeling when you need to. You don't always remember to, but I do think that when I need to, I know that I can do anything.

Decision making. Seven participants discussed how they use the memory of their profound experience when making decisions. The memory may guide everyday behaviors or may surface when a current situation triggers the recollection of the profound experience.

Julie believes the memory of her overnight camping experience guides her everyday decisions. She stated, “It’s kind of subconsciously built in now. It guides a lot of my choices and preferences and what I look at and look for and I guess the contents I curate.” Tina had similar sentiments about the book she read. She said, “That interconnection has affected my daily life in absolutely everything all the time.”

Stephanie spoke of how connecting with the inhabitants in the woods near her childhood home guide her daily decisions and contributed to her current sustainable lifestyle. She compared herself with others and commented,

> I mean, the differences I see in myself and then some people who are maybe closer to the opposite side of the spectrum, which would be the choices in the foods that I eat being local and sustainably sourced and organic and not processed…Yeah, when I see the way other people live, again, I have to think that a lot of that is contributed to that original experience.

Jonathan uses the memory of witnessing the ecosystem changes when he considers the impact of his actions. He commented, “My everyday actions I certainly consider where I want to have my impacts… Let's make conscious choices about how I'm going to impact today."

Kyle’s memory of hiking the Appalachian Trail serves as a source of inspiration in his work. He thinks back to the difficulties he encountered, the triumphs, and the lessons learned. He said, “I definitely use it as a source for inspiration or advice or whatever, for all of the folks I talk to, for sure.” Lindsay uses the memory of interacting with the volcanic rocks in her work as a songwriter. She described the process,

> I'm a singer–songwriter and … that visceral connection with the natural world and with the world around me… with other than human world, more than human world, whatever

> you want to call it, that visceral connection with the world... is a huge part of my songwriting capacity I would say. Like storytelling, your stories are that much deeper when you have something to feed off of, an image, or an idea, and a physical sensation for me is extremely powerful in songwriting. And so, it's almost like that first experience I'm telling you about was like a gateway into like another sense.

Today, Susan uses the memory of feeling complete clarity while sitting in the social worker's office when making difficult decisions. "I like to hearken back to it and remember it from time to time...I remember it, and I think try to incorporate it. I try to say, 'Let's see if I could have that feeling regarding this other circumstance.'"

Sharing. Participants have shared their profound experiences with loved ones, acquaintances, coworkers, strangers, and the general public. The retelling of the experience is used to educate, create or deepen social relationships, or foster a love for the natural world. Sixteen participants had shared the memory of their profound experience in some capacity, while four first did so during the interview. One participant did not acknowledge whether he had shared the memory of his experience with anyone.

Chad uses the story of his encounter with the deer as a learning tool. As a middle school teacher, he uses the story to inspire his students. He reflects,

> Certainly, some of the instruction is connected to that experience and how I present information to students. I started to understand the power of stories and how this was one of those powerful stories… I think it has informed me as a teacher that stories are really powerful, especially these personal stories, personal narratives where you have experienced something magical in nature can be the hook.

Erin shares her experience on the organic farm to connect with other people. She said,

> I feel like it's not a really isolated experience that has no connection to other people, or the world around me. It just seems like it could fit in a lot of conversations and it's my favorite thing, so that's what I talk about.

Kim's time among the giant sequoias left her wanting to pass on her love for the natural world to her children. She expressed this desire, "It's made me… realize that we're just a small part of nature and... I need to pass that on to my children so that they have a reverence toward nature and our part in taking care of our world."

Impacts of Profound Experiences with Nature: Memory Function

Participants described using the memory of their profound experiences in various ways. Below, I place these findings within the memory function framework. Nineteen participants attributed the memory of their profound experiences with nature to understanding their sense of self over time. Sixteen of the participants used the memory of their profound experience with nature in a social function. All 21 participants described using the memory of their profound experience with nature to direct present or future behaviors. Twenty of the 21 participants described using their profound experience with nature for two or more of the memory functions.

Self. The self function of autobiographical memory refers to thinking about past events to understand who we are today. Participants use the memory of their profound experience to consider how the experience changed them. Reflecting on the memory allows an individual to gain a better understanding of self over time. Of the 21 participants, 19 (90.48%) spoke of how their profound experience with nature helped them understand who they are today.

Kyle learned a new way of existing and creating change in the world after his time on the Appalachian Trail. He stated,

> The way I felt before the trail was I had to work as hard as I could to bring outside change. After the trail, I definitely, my mind changed to where help people as much as you can, but the way that you're going to help the overall consciousness of the planet is by helping yourself and just focusing on doing what you believe in.

Joseph was quite young when he first saw the baby birds, and as a result, he believes the moment helped him understand his relationship with all other beings. He reflected,

> I was a little kid. I think you don't have that grand awareness of the universe, and I don't mean the stars and the sky… The bird moment of recognizing, "Hey, I was that helpless baby once. Hey, I need to be fed. Hey, I have a home. Hey, there's mom." Just that's how I see the world of nature. I just see all those relationships…That moment, I think, having that sense of empathy.

Julie's first time camping created a sense of self in her. She said simply, "I just kind of feel like it somewhat defines me as a person." She continues, "I think I'm more holistic and complete… I feel like I can seek out certain things and I think before that I was just missing and rushing through. I'm more intentional now." Kim's experience walking among the giant sequoia trees made her recognize her own insignificance. She stated,

> I do see myself as being much more insignificant and also to realize that the small things that happen, the trees keep on going, they keep on doing their thing no matter what is going on, and it has also made me realize that ... the bigger picture of things. That no matter what happens life does keep on going, even if we don't think so.

Chad's experience with the deer changed how he sees himself in relation to other living beings. He stated,

> Because of this experience, I am more of a happy observer rather than a must be participating ... I don't know if participating is the right word, but my engagement level has evolved or changed in a way of I don't need to touch the thing, I can just observe it and I'm happy with just that.

Lindsay's experience with the volcanic rocks completely changed her understanding of herself and her relationship with the natural world. She reflected,

> Before that experience, I didn't have that experience, I didn't have all the feelings associated with it. And then after, the level of reverence I have for the natural world and for the world is… I'm having it at a deeper level, at a different level, at a visceral level. And that stays with me… I feel like this experience, and experiences like it, have given me that ability to be in nature, and really have, not just an open awareness of observation that you get through science, and that I got through my scientific training, but also this feeling of love for the place I'm in. You know, this feeling of affection and connectedness to it.

Melanie's experience of learning to swim was life changing and gave her a new understanding of who she is. She stated, "So now I feel from nonswimmer to swimmer, from needy to more independent, from that ship has sailed to no ship has sailed." Stephanie also reflected on how her time interacting with the plants and animals changed her. She said, "I think that it probably made me more calm…And so I imagine, even as a child, that contributed to me feeling more calm and peaceful and happy and probably healthier, I'm sure healthier." Likewise, Hope felt changed after her experience with the giant cuttlefish. She reflected on her experience and its effects:

> I'm a psychotherapist and a lot of my work involves me being very quiet and really being deeply present. And I'm sort of just connecting that right now, actually, as I'm thinking about it, that there's a way in which it was a moment of intense presence… I think that it is something I can actually tap into when I'm needing that reminder to be present, to just be in that silence.

Tracey described how her understanding of herself, as a 50-year-old career woman, was altered as a result of the little African boy's comment about her being a rich American and peeing in her water. She stated,

> And so at 49 I went back to school, I entered academia again. So I went from medicine to law. Had to learn a whole new language because I was so involved in medical language and science terms because I was also very connected to science, of course, with the research and stuff. So I entered into this knowing that I was going to change my career and a lot of things were going to change for me and my family, because not only was I leaving a big corporate salary to do what I was passionate about, but starting new.

Michelle learned how to be comfortable alone in nature after her experience observing turtle nests by herself. She reflected, "I feel like that was a big turning point, learning that I could be by myself and be okay. Erin also learned about herself after working on the organic farm. She stated, "[I] really feel like a real farmer, even though I'm totally not. But, I feel like that is part of my identity… A lot of my research has involved planting stuff outdoors in big, open fields. It feels like a part of my identity."

For Bridget, her experience of watching ants in her backyard helped her to see her connection to all living beings. She stated, "I think it just helps me realize that we're

interconnected with other living things. And my perspective is really interconnection of people and nature."

Jonathan's experience of witnessing the changing ecosystems boosted his self-confidence and shaped how he views the world. He reflected, "It certainly increased my confidence that I was pursuing a worthwhile path… and solidified that integrative view that I look at everything."

After sleeping on the canoe, Ruth felt the experience defined her identity as someone who likes to spend time outside and who can do anything. She stated,

> I think there's certain things… that help you to feel like you can do anything that you want to do and that there are no obstacles. And, I think that that actually probably was something, whether that perceived risk just made me feel like now I'm a real outdoors woman.

Susan's experience of seeing the nature image while in the social worker's office cemented a new image of a confident self in her mind. She stated,

> I liked feeling so clear and so connected to that moment. There was no doubt about it. I suddenly knew what I felt, what I wanted to do. I was right there in that moment. It was so immediate. I'd like to think of myself as being able to be that way much of the time. I don't know that I am, but that's the image of myself I'd like to have.

Tina spoke of how she sees herself differently after reading the book, *13 Original Clan Mothers*. She feels she is "more connected to everything, everything, which is a nice feeling to know that you're interconnected with everything… So there is that bigger sense that we're all one body." Mary always recognizes her connection to the greater world after her experience of becoming one with the rock. She stated,

> The Rock never left and I don't know the moment where I felt like I entered into its crystalline nature, whether maybe I was once a rock, I don't know, but I understood The Rock and it was a part of me and I was a part of it.

Social. The social function of autobiographical memory is associated with the sharing of an autobiographical memory to create social interaction, empathy, and social bonding. In the context of this study, participants use the memory of their profound experience with nature to bond with others over similar experiences, establish intimacy and invite others to understand them at a deeper level, share a love for the natural world, and to educate others. Sixteen (76.19%) of the participants described an effect resulting from their profound experience with nature that would be considered social. One participant did not answer my question of whether he shared the memory of the experience with others. Some participants who did acknowledge sharing mentioned how they considered the experience private and only shared the memory with someone who can either relate or appreciate the profoundness of it. Other participants shared the experience at every opportunity they can.

Never shared. Four participants (19.0%) stated that they had never shared the experience with someone else. When asked if he had shared the story of seeing the baby birds in the nest, Joseph responded, “I'm a storyteller. I don't know that I have. This one is very different from ... A lot of times I've shared a story and there's a significant adult in there. This happens to be different. No, I don't think I've shared this one.” When Ashley was asked whether she shared the experience of seeing trash on the side of the road, she simply stated “No. Not really. Not that I know of.” When asked if she mentioned it to her parents with whom she was riding in the car, Ashley said, “No. No, it was internal thoughts.” Likewise, when asked if she ever shares her story of the Rock, Mary replied, “Never. It’s kind of a very private experience.” Susan also

stated that while she did discuss the experience of seeing the image with her therapist, she has not shared it with anyone else because, “It was a magical moment. I can’t describe it as anything less. It was just magical because it was so influential.”

Shares occasionally. Seven participants (33%) stated they occasionally share the memory of their profound experience with others. Lindsay’s experience with the volcanic rocks was so powerful that she rarely shares the story with others. She described why,

> But this memory, I don't talk about it often because it's so profound ... It's not something you just bring up in everyday conversation. It's something that I would share maybe in a really special moment with somebody I care about, and that I know cares about me, and that I know would understand. Or that I feel would understand me. It's something that I would bring up… if I'm with somebody and we have an experience that reminds me of it ... you know if we're out in nature and I'm like, "Oh my gosh I'm just really feeling it right now. This reminds me of that one time…"

Nicholas has only shared the story of watching the hummingbird with his wife. He stated, “I'll talk with my wife about it from time to time. I'll bring it up. I'll be like, "Oh man, I still think about that hummingbird that day." When asked if he has shared it with others, Nicholas stated, “It was more of an emotional thing than just a beautiful scene and I guess I don't necessarily talk about my emotions that frequently with people I'm not very close with.”

Stephanie discussed how she has only occasionally shared the story of communing with the wild creatures and plants near her home. She reflected, “I don’t often talk about my childhood experiences. They come up once in a while.” Similarly, Tina stated,

> I think anybody, acquaintances might not know because I do tend to watch what I say because sometimes my thinking is a little off beat, but anybody who knows me will know

> I think like this because I do mention it. Not that particular experience but again the interconnectedness and that kind of thing.

Tracey only shared the story of the little boy's comments in the cover letter of a job application. She was surprised by the lack of interest in hearing more about the story. She stated,

> When I applied for the job, it was on my cover letter, and they ... One person. Not even all, and it's this, an environmental place, nobody batted an eyelash at it except for the HR person, who then, "Hey. You had an interesting point on your ... Can you tell me more about that experience?" So I thought that was interesting because to me it was like my profound moment, and at the same sense, I'm applying for an environmental job, nobody commented on it, but one person.

When asked if she shares the story of her first time camping, Julie reflected on the experience and stated,

> I have to be kind of in a real conversation. It comes up. I mean, probably when I get to know some of the new staff or probably maybe once, once or twice a year. But it's always in me in kind of in the subconscious and kind of dictating a lot of the other more recent things I do in nature or in my profession.

Ruth has shared her story of sleeping in the canoe, but reiterated, "I have [shared the story]… not that many people I don't think. I mean, not that many people would probably relate to it."

Shares frequently. Nine participants (43%) frequently share the story of their profound experiences with nature. When asked if she has shared the story of walking among the giant sequoias, Kim stated, "I've probably talked about it maybe 10 to 20 times... I don't think that

everybody gets its, the people that I've shared it with are the people that probably would have that same kind of feeling."

Melanie has shared her recollection of learning to swim with quite a few people, "all my friends." She stated,

> I have shared with them… maybe not the entire story in such detail but just the experience of overcoming what I thought was an immovable object in that regard and how incredibly liberating it has felt for me and many people have said they have felt inspired by this story.

Chad shares the story of his encounter with the deer quite often. At the beginning of each school year, he shares the story with his students as a way to excite the students for weekly sit spots. Chad also shares the story in social environments whenever appropriate. He described his sharing,

> Sometimes out at a bar it is sometimes a story that's told. I'm sure the people who hang out with me a lot have heard it multiple times, but I share it a fair amount. Sometimes just interesting things like on social media I saw a friend who posted a cell phone video of some little skipper deer hopping out in their backyard. They posted it and were like, "This is really special." Then I'd private message them and say, "I had a special moment with a deer too, are you interested in reading this?"

Jeffrey has shared about his profound experience and the retelling of the story emotionally affects him. Reflecting, he said, "I've told my cabbage story a couple of times. Nine out of ten times, I end up the same way. I just start crying. It was so ... These ladies were so beautiful." Likewise, when asked if she shared the story of her encounter with the cuttlefish, Hope responded, "Oh yeah, oh yeah. Divers love sharing their experiences with each other."

Erin likes to share about her time on the organic farm. She expressed, “I talk about it, honestly, whenever I get the chance to. I don’t know. It’s just one of those good experiences.” Similarly, Michelle shares the story of her time observing the nesting wood turtles. She stated,

> I feel like I talk about it quite often whenever I talk about human dimensions or how I got to be where I am and that sort of thing. I just feel like I always bring up that story, especially in job interviews and things like that. I'll mention how I got to be where I am, and that's how I, usually the story that I tell about, my turtles.

As for Bridget, she said she shares the story with others “Just to kind of explain why I got into what I got into if people don’t know me.” Kyle communicates the story of his time on the trail with his interns or customers. He stated,

> I constantly go back to examples of things and stories that were happening on the trail, or reasons why it happened, or lessons learned. Those are things that just come up sporadically in conversation. We'll be having a conversation and it will click me into that.

Directive. Autobiographical memories serve a directive function, meaning they are used to direct present and future decisions and behaviors. This memory function almost exactly matches the “living with meaning” theme developed through inductive coding. As explored in detail in that section above, all participants stated that they used the memory of their profound experience in this way. Every participant recounted how they used the memory of their profound experience with nature in their everyday choices, as well as in bigger life decisions. A few additional key examples follow.

Reflecting on her time sleeping in the canoe, Ruth accounts for her becoming a canoe instructor to her initial profound experience. She stated, “I became a canoe instructor and canoeing has always been my thing now.” Similarly, Bridget spoke of how her profound

experience with the ants affected her both directly and indirectly. She described the effects, “It did change me. I got my PhD and it’s so weird. It wasn’t like I was looking for a soils position, but a soils position happened to open up and then I worked with soil for my PhD.”

When Lindsay fell in love with the volcanic rocks, the experience affected how she interacts with the world around and ultimately her career. Related to her work as an environmental educator, she stated, “I feel that this experience and the memory of this experience that I have been telling you about has given me the capacity for this kind of storytelling… It's given me this excitement about the natural world.”

Jonathan altered the way he interacts with nature after his experience at scout camp. He has a “conscious awareness… and knowing that whatever I'm going to do is going to have some impact and that makes me make conscious choices.” Susan keeps the memory of the image in her mind and garners the clarity and confidence she felt at that moment. She reflected, “I remember it, and I think try to incorporate it. I try to say, "Let's see if I could have that feeling regarding this other circumstance."

Melanie’s experience of learning to swim affected her approach to life. She reflected, “but it has been the last couple of years I would say that I really have changed… somehow I'm experiencing everything differently.” The experience of seeing the hummingbird in his backyard was the stimulus for Nicholas taking charge of his life. He stated, “I would say it affected my behaviors toward myself… I did make a conscious decision to work on that [drinking alcohol].” Later, he reflected a bit more, “I just think overall, my state of happiness and overall sense of well-being has improved.”

Stephanie believes her early childhood experience communing with the plants and animals ultimately affected her life and her daily decisions. She stated, “My behaviors everyday

with conserving fuel and trying to buy fuel-efficient vehicles, picking up litter and recycling or just cutting down on waste in general." Similarly, Hope uses the memory of her encounter with the giant cuttlefish as a reminder to slow down and be present, rather than rushing through life. She stated, "And when I go paddle boarding, I just go really slowly because I just wanna absorb everything I'm seeing, everything that's around me."

As described above, Michelle's experience with the wood turtles guided her decision to pursue a graduate degree in human dimensions of natural resources. She discussed the significance of the experience in her professional life, "I think it really changed my career path and what I ultimately wanted to get out of my career. That desire to make a difference."

Erin discussed how the memory of working on the organic farm affected her decision to attend graduate school. She stated after her time on the farm, "I knew that I wanted to continue in a way that would allow me to interact with plants and people." Her time on the farm also affected her food choices, now preferring to buy local food, shop at farmer's markets, and participate in community supported agriculture. Tracey spoke of the specific decisions she made after hearing the little boy's words such as trading in her BMW for an electric car and enrolling in an environmental law program. But ultimately the words prompted her to act. She reflected, "I think that the meaning of his message was pretty strong, and what I need to do now is to do my best in using my new education, my new experience here, and trying to make a difference."

Kyle reflected on his time on the trail and how he uses what he learned in his work as the owner of a scuba diving company. He stated,

> When I think of an idea, or a trip that we want to do, some place that we'd like to do some more studies on, all of the conversations and the brainstorming that happened before the

trail have helped me plan all of the expeditions that we've done after that, as far as how to talk to people, how to make the proposals so that they're agreeable.

Jeffrey spoke of how the memory of his cabbage experience affected not only individual choices and behaviors but his whole life. He described making a grocery list and being intentional about what he buys, consciously trying to waste less, composting, letting go of the need for "a beautiful front lawn," and becoming politically active. He reflected on how his overall values have changed and stated, "It's a whole different way of thinking."

Other Findings

Age at time of profound experience. The age at which participants reported having a profound experience with nature varied from early childhood through late adulthood (Table 5). The mean age is 25, with a range of 6 to 63. The age range during which the greatest number of participants report having had a profound experience with nature is childhood (ages 6 to 10). The five participants whose profound experience with nature occurred during this age group were engaging in "direct, informal, and unstructured" exploration in natural spaces (James et al., 2010). Bridget was in her backyard, watching ants collect tiny pieces of soil. Joseph was playing hide-and-seek outdoors when he discovered the bird's nest. Stephanie was exploring abandoned lots and engaging in fantasy play during her profound experience. Mary became the rock when alone in the farm field near her grandparent's house. Ashley witnessed the harmful behaviors of humans toward nature through a car window while traveling along a busy highway.

The age group with the next highest number of profound experience with nature occurrences was 16- to 20-year-olds. Four participants recounted experiences occurring during this time. Ruth paddled a canoe into the middle of the lake and slept under the stars. Jonathan recognized changing tree species while at scout camp. Michelle spent up to 12 hours a day on her

own on a beach in Nova Scotia monitoring wood turtle nests and Julie experienced her first overnight camp while in a teenage ecology workshop. These experiences fall under stage three or four of James et al.'s (2010) development model for becoming an environmentally involved individual. These participants were engaged in outdoor activities with individuals outside of their immediate family and embraced their identities as outdoor enthusiasts or future professionals.

Five of the participants recounted having a profound experience in their twenties, again consistent with James et al.'s (2010) fourth stage of the developmental model. Not one profound experience occurred during participants' early thirties, yet two experiences happened in the late thirties, and another two occurred in the early forties. One participant recalled having a profound experience in her late forties, and while no profound experiences with nature were reported in the decade of the fifties, one participant reported a profound experience with nature after the age of 60.

Table 5

Age Range at Time of Profound Experience with Nature Occurrence

Age at time of experience	**Number of participants**	**Percent of total**
Birth – 5	0	0
6–10	5	23.8
11–15	1	4.8
16–20	4	19
21–25	2	9.5
26–30	3	14.3
31–35	0	0
36–40	2	9.5
41–45	2	9.5
46–50	1	4.8
51–55	0	0
56–60	0	0
61–65	1	4.8
66–70	0	0
TOTAL	**21**	**100**

Number of years since a profound experience with nature. The number of years since having a profound experience varied greatly among participants (Table 6). Only about a quarter

of the experiences shared in this study happened fewer than ten years ago (23.8%). The majority of the experiences happened more than a decade ago (76.2%).

Table 6

Years Passed Since Profound Experience with Nature Occurrence

Number of Years	**Number of participants**	**Percent of total**
0 – 10	5	23.8
11–20	6	28.5
21–30	3	14.3
31–40	2	9.5
41–50	3	14.3
51–60	1	4.8
61–70	1	4.8
TOTAL	**21**	**100**

Location of profound experience with nature. Study participants reported having a profound experience with nature in a variety of locations. Six participants (28.6%) reported having their profound experience with nature in an indoor location, while fifteen participants (71.4%) recounted having their experience in an outdoor location. The variety of locations indicates that these experiences can occur both indoors and outdoors, supporting my decision to include both direct and indirect experiences as demonstrated in Table 7.

Table 7

Reported Locations of Participants' Profound Experiences with Nature

Bridget	In the backyard of her childhood home
Tina	Inside her home
Joseph	In a field beside his childhood home
Lindsay	On a small hill near the visitor's center on Mauna Kea
Ruth	In a canoe on a lake at Camp Louise in northeastern PA
Ashley	In the backseat of her parent's car driving between NJ and PA
Tracy	Outside in a small village in Africa
Melanie	In a swimming pool
Erin	On an organic farm in Bucks County, PA
Jonathan	In a Boy Scout camp in MD
Stephanie	In the woods near her childhood home
Nicholas	In his dining room looking out into the backyard of his home
Michelle	On a beach in Nova Scotia
Julie	In the Adirondacks
Susan	In a social worker's office
Kyle	On the Appalachian Trail
Hope	In the water off of Borneo
Jeffrey	In a high-rise apartment building in Trenton, NJ
Mary	On a boulder in a field in VT
Kim	In Mariposa Grove
Chad	Next to the Colorado River in NH

Memorable and meaningful. I asked participants why they felt the experience was memorable and meaningful. Specifically, I wanted to understand what about the experience made the participants remember details so clearly even decades later and the value or significance this one experience held in the participants' lives in comparison to other memorable events. The most common response centered on those experiences that felt defining. Nine out of 21 participants (42.9%) recounted how their profound experience with nature helped them understand or identify the essential meaning of an aspect of their lives. The profound experience

with nature gave these individuals confidence or courage where once lacked, changed their view or approach to nature, and prompted them to take action. Eight participants (38.1%) described their experience as an awakening experience, meaning they realized or recognized something new as a result. Four participants (19%) identified their profound experience with nature as memorable because of the connection they felt with the natural world. It should be noted that participants often spoke of more than one reason why the experience was memorable. The breakdown above represents the most significant reason reported by each individual for why they felt their profound experience with nature was memorable.

Different view of self. When asked if they saw themselves differently after their profound experience with nature, the majority of the participants (76.2%) responded that they saw themselves in a new light. Four participants (19.0%) reported they did not feel differently, and one participant did not respond to the question.

Summary of the Impacts of a Profound Experience with Nature

The participants in this study reported various impacts of a profound experience with nature. Participants described numerous effects resulting from their experience, some of which occurred immediately, and some of which developed over time. Participants conveyed how their profound experiences with nature allowed them to become a more authentic version of themselves by becoming more aligned with their true nature, displayed by gaining confidence in their capabilities and spiritual beliefs. Participants also experienced changed social relationships stemming from their profound experience with nature, including with other people, living beings, nature as a whole, and inanimate objects found in the natural world. Living with meaning was another effect described by participants in this study. This effect manifested in daily decisions and directional life changes such as academic plans, career paths, and significant, life-changing

transformations. Finally, participants described how the memory of their profound experience with nature is still with them today, and they are therefore able to relive the past. Participants recounted drawing on the memory in times of mental stress when they need encouragement, confidence, or courage; when they are making decisions; and when sharing the memory with others.

Chapter 5: Discussion

I investigated the memories of 21 individuals who had a profound experience with nature and the lasting effects of those experiences. Little research has examined the long-term influences of profound experiences, nor has the memory function framework been used to address this question. My research fills these gaps by demonstrating that a profound experience with nature can influence an individual's understanding of self, social relationships, and subsequent decisions and behaviors. The findings also reveal that the memories of a profound experience with nature continue to have a lasting effect and can and do serve self, social, and directive functions, as well as a possible fourth function: developing and appreciating relationships with other-than-humans.

In this chapter, I situate my findings with respect to the literature, theory, and research most relevant to my study. I begin by discussing my choice of a new term, "a profound experience with nature." Next, I organize my discussion in terms of the four major themes identified in Chapter 4, comparing these themes to the three functions of memory. I then address the implications of this study, as well as the limitations and biases I encountered during the course of my research. Finally, I offer suggestions for future research in hopes of acquiring greater insight into the lasting effects of a profound experience with nature.

Choice of the use of an umbrella term

My research focus is on singular profound experiences with nature, which is different from other SLE research. While SLE research does include these single experiences, it also includes repetitive or extended experiences. My dissertation is therefore unique in its the focus on singular profound moments. The term I use to describe these singular moments, which shift an individual's view of or relationship with the natural world, has precision to it in that it focuses

on just this one type of SLE. In my research, I discovered there can be great variety among the experiences that participants describe as profound. This diversity in profound experiences demonstrates the need for a term that focused on singular profound moments as a subset of SLE research.

As evidenced in the literature review, many terms exist which describe memorable and meaningful moments related to the natural world. However, no previously discussed term accurately described the type of experience I wished to explore in this study. I decided upon the term "a profound experience with nature" because it was inclusive of similar phenomena studied in the past while remaining open to the possibility of yet-unexplored experiences. I recognize and appreciate that profound can mean something different to each one of us. What is most important is that the study participants believed that the experiences they shared were profound.

Participants interpreted the term "profound" differently, yet it became evident during data analysis that similarities existed across the experiences. As I analyzed the experiences and the subsequent effects, I was able to identify common characteristics. Participants described the experiences as: personally transformative, illuminating, meaningful, emotional, memorable, aesthetic, unexpected, fleeting, enlightening, enduring (in results), ineffable, leading to the realization of one's true identity, providing a sense of transcendence, and passive. Similarly, emotions related to a profound experience described by participants included: happiness, awe, ego-transcending, connection, and loss of fear and anxiety. It is important to note that not every profound experience described in this study encapsulated each of these characteristics or emotions; however, these were all mentioned by one or more participants.

A careful comparison was made between the characteristics and emotions associated with a profound experience in this study and those reported for similar phenomena. I determined that

no previously used term accommodates all that was felt and experienced by the study participants. Similarly, not all characteristics and emotions accounted for in other phenomena are associated with a profound experience.

The range of profound experiences described by the 21 participants demonstrates the need for the continued use of an open term such as a profound experience with nature. None of the previously used terms are broad enough to be inclusive of all types of profound experiences recounted in this study. For example, Susan's vision of walking in the woods as rays of sunshine filtered through the trees fails to fit into any pre-existing term. Susan was not actually in nature when this experience occurred, nor was she experiencing it in an indirect manner as described in previous research. Her experience was completely within her mind, yet it was so real and transformative to her that it could only be described as profound. This example demonstrates the need to broaden the definition of indirect experiences as discussed within the SLE literature.

In contrast, Kyle's experience of thru-hiking the Appalachian Trail was a six-month journey in which he was completely absorbed within the natural world. He headed to the trail to get away from humanity, but during his time on the trail, he instead discovered a new appreciation for humans. While Kyle's experience could be considered a peak experience or transcendent experience, these types of experiences are not necessarily associated with nature, which is a requirement of a profound experience with nature. In addition, in my research I failed to find examples of peak or transcendent experiences lasting for an extended period of time, as Kyle's did.

My findings demonstrate that a new term was needed to capture the multiplicity of experiences for which previous terms did not account. As illustrated in the two examples above, the profound experiences described cross the boundaries of or fail to fit precisely within any pre-

existing term. Retaining the openness of the term, a profound experience with nature, allows my study to encompass experiences under previously used terms, while also allowing for the possibility of yet unexplored profound occurrences experienced by my study participants.

While introducing this new term into the SLE literature is valuable because it recognizes the diversity of singular profound moments, concerns may also exist. Some may argue that the term profound experience with nature is too broad; however, the term has precision to it because it only addresses singular transformational moments. As discussed earlier, most SLE research focuses on repetitive or extended nature experiences. Similarly, the term broadens the diversity of indirect experiences previously explored in SLE research. One experience described in my study, Susan's image of a nature scene, expands our understanding of what can be considered an indirect experience with nature.

Finally, my decision to allow participants to interpret the word "profound" for themselves may need explanation because what one considers profound will vary from person to person. Thus, some people may argue that some of the profound experiences described by participants are not truly profound; yet, by allowing participants to define profound for themselves, I was able to discover a great variety of transformational experiences. The next section grounds this range of experiences in the SLE and memory function literature to better understand how participants use the memory throughout their lives.

Discussion of Major Findings: Four Emergent Themes

Study participants did not distinguish between influences or uses of their profound experience with nature during interviews. Instead, they spoke fluidly about the impacts of their experience and how they used the memory in their lives. For participants, the influences and uses were interlinked. Hence, the discussion that follows weaves the influences and uses of a

profound experience with nature together and roots them in the significant life experience and memory function literature. My inductive analysis developed four themes: becoming authentic, altering social relationships, living with meaning, and reliving the past. After deductively analyzing the data, I surmised that the uses described by participants do support the three established functions of memory (self, social, and directive), while also offering a possible fourth function: developing and appreciating relationships with other-than-humans.

Becoming authentic. Nineteen of the 21 participants described how a profound experience influenced their self-conception, which encompasses their understanding of their potential, their guiding principles, and their place in the world. The fact that the vast majority of participants felt more authentic after their profound experience suggests that these types of experience have the potential to redefine an individual's understanding of self.

Eight participants gained self-confidence or courage following their profound experience, propelling them to feel empowered to be who they genuinely want to be. A similar effect has been documented in previous research that describes individuals who feel more in tune with themselves during a moment of profundity such as a peak experience (Maslow, 1964) or spiritual transformation (Cohen et al., 2010). Many commonalities exist between these experiences, including the characteristics of being memorable, illuminating, involving profound beauty, and experiencing a sense of transcendence leading to personal transformation and a realization of one's true potential. People who undergo these experiences express feelings of happiness, wonder, peace, and a connection to something greater than self. Overall, these experiences are positive and allow individuals to feel capable, confident, and empowered to be a better version of themselves.

Becoming authentic manifested as a shift in personal values for two participants. Both participants reflected on how, before their profound experience with nature, they were more focused on themselves and their success. Afterward, both described a noticeable shift in what was most important in their lives. They realigned their values to place more emphasis on the natural world and less on themselves. Environmental psychologists would consider this a transition from *egoistic values*, associated with individual concerns or outcomes, to *biospheric values*, which are values more aligned with nature (De Groot & Steg, 2007, 2008; Stern, Dietz, and Kalof, 1993; Steg et al., 2005). Previous studies of related phenomena also describe similar findings. While Merrick (2008) did not specifically isolate value changes after an environmental epiphany, she reported that 75% of her study participants reported changes in environmental values, attitudes, and behaviors.

Similarly, Miller and C'de Baca (2001) reported lasting changes in attitudes, beliefs, emotions, and values resulting from quantum change. Maslow (1964) also documented individuals becoming less selfish and transcending the ego while in a peak experience. While my findings confirmed the potential of a value shift after a profound experience, only two of the 21 participants reported this particular effect, which is significantly less than that reported by Merrick (2008). However, I did not explicitly ask participants if their values changed as a result of their profound experience. Perhaps if I had posed this question, more participants would have acknowledged a reprioritization of their values. This finding warrants a more in-depth exploration between the potential connection of profound experiences and subsequent value changes.

Becoming authentic was also described as an expansion of spiritual beliefs or an acceptance of a universal truth by four participants (19%). These four described a lack of religion

or spiritual belief before their profound experience, but after, an openness to a belief in something more such as the possibility of a higher power like a God, Gaia, or the healing power of nature. These characteristics are discussed extensively in the literature of related studies in terms of conversion and mystical experiences (James, 1929), peak experiences (Maslow, 1964), quantum change (Miller & C'de Bacca, 2001), transcendent experience (Davis, 2016; Roy, 2001; Williams & Harvey, 2001), awe (Keltner & Haidt, 2003; Maslow, 1964), epiphany (Jauregui, 2007: McDonald, 2008), and spiritual experiences (Cohen et al., 2010). Each of these experiences offers insight into new truths or meanings, leading to personal transformation. This expansion of spiritual beliefs and opening to the possibility of universal truth are essential to feeling connected to something greater than self.

Five participants (24%) discussed how they felt a deeper connection to everything else in the universe resulting from their profound experience with nature. They described it as an interconnectedness between all living beings and the nonliving world, or as no longer feeling apart from nature but instead a part of nature. Participants used this intimate connection to understand their place in the universe, resulting in a new sense of self. These findings support the results of similar studies. Williams and Harvey's (2001) study of transcendent experiences found that participants expressed harmony with the greater world, and outdoor recreationists in Brymer et al.'s (2009) study also reported feeling connected to the natural world in which they practiced their extreme sports. Similarly, Perrin et al. (2018) reported that participants felt a stronger connection to and more profound respect for the natural world after an encounter with a w"ild animal. These findings suggest that profound experiences have the potential to expand an individual's conception of self beyond the physical limitations of the human body into the greater universe.

Changed social relationships. A profound experience with nature had a prominent effect on the social interactions of study participants. Twenty of the 21 study participants (95%) described subsequent changes in relationships in some capacity after a profound experience with nature. Specifically related to other humans, 76% recalled a positive connection with other people resulting from their experience, similar to the 60% of individuals who reported similar feelings after their environmental epiphany (Merrick, 2008). Study participants spoke of feeling connected to others with common experiences or interests, seeking outdoor experiences with like-minded individuals, feeling inspired to act for the benefit of others, recognizing a deeper intimacy with others, and wanting to share a love for the natural world and educate others.

An unexpected finding of the study was that 14% of the participants felt more disconnected from humans after their profound experience with nature. These three participants recognized differences in how they chose to live their lives compared to others. They spoke of making intentional and beneficial decisions for the earth, of the intimate relationship they felt with all life or the anger they felt when others harmed the earth. At the time of this writing, I was unable to find any other studies documenting a negative relationship with other humans after a profound experience. The lack of research in this area and the contradictory finding suggest a need for future research into understanding the ways in which human relationships change after a profound experience.

Living with meaning. For all 21 study participants (100%), their profound experience inspired decisions and changes in behavior. Participants described using the memory to guide everyday decisions such as where to shop, what to buy, or how to spend free time, or to help make more significant life decisions related to academic paths, career tracks, or major life shifts.

The significant life experience literature abounds with studies indicating a connection between formative experiences in nature and resulting care, concern, and action toward the environment (Chawla & Derr, 2012; Tanner, 1980; Gunderson, 1989; James, 1993; Liddicoat & Krasny, 2013; Palmer, 1993; Peterson, 1982; Peters-Grant, 1986; Sward, 1996). Likewise, previous studies of related experiences document a transition to more environmentally beneficial behaviors and activities (Brymer et al., 2009; Caston; 2014; Davis, 2016; Merrick, 2008). My findings are consistent with the results described above, as evidenced by participants recounting changes in behaviors considered beneficial to the environment including in their daily mundane decisions, time spent outdoors, academic pursuits, and career paths.

Eight of the 21 study participants (38%) spoke explicitly about positive behavior change after their profound experience such as buying local products, purchasing organic or GMO-free food, reducing food waste, composting, driving an electric vehicle, using a reusable water bottle, recycling, picking up trash, and caring for plants and wildlife. Likewise, nine participants (43%) spoke about engaging in more nature-based activities such as walking outdoors, canoeing, backpacking, reading, and volunteering after their profound experience with nature. This finding demonstrates a connection between profound experiences and behavior change, signaling that fostering similar experiences may help encourage better environmental behaviors in others.

Five participants (24%) attributed their profound experience with nature to influencing the academic major or school they chose. By igniting or strengthening a passion for the environment, these individuals went on to study human dimensions of natural resources, soil science, environmental law, ecological teaching and learning, and Jungian psychology. Likewise, eight participants (38%) acknowledged subsequent career-related decisions. A profound experience with nature either strengthened an existing career path or was the inspiration for a

career change. A majority of those participants who attributed a profound experience with nature to career-related decisions did pursue an environmental career (parks and recreation, land stewardship, environmental education, outdoor adventure, higher education, environmental consulting).

Interestingly, a profound experience with nature did not necessarily lead to a career dedicated to environmental care or protection, as demonstrated by two participants who followed another path (clinical psychology and physical therapy). During the interviews, both participants acknowledged a connection between their profound experience and their career. Hope's experience with the giant cuttlefish triggered within her a sense of wholeness and connection with the world. It prompted her to consider her relationships more closely, consider her existence, and examine the decisions she made. Years later, she finds herself studying Jungian psychology and recognizes the connection between her profound experience and her career choice. Similarly, as Mary reflected on her decision to become a physical therapist, she acknowledged that her time with the rock led to her pursuit of a "rock-solid" career. While these findings support the findings of related studies on environmental epiphanies (Merrick, 2008) and transformative experiences with nature (Caston, 2014), they also challenge scholars to think more deeply about the underlying connections between profound experiences and resulting academic and career decisions.

For two participants in the present study, their profound experience with nature was life changing. The moment signified an escape from a negative environment or destructive behaviors and the opportunity to begin anew. For both, they recognized the significance of the moment and how their lives would never be the same. Their profound experience with nature significantly changed their behaviors, their entire life course, and their understanding of who they are and

whom they could become. These experiences align with previous findings (James, 1929; McDonald, 2008; Miller & C'de Baca, 2001) and affirm the potentially life-changing effects of a profound experience with nature.

The memory of a profound experience with nature not only influenced participants' behaviors, but also their feelings and attitudes about themselves, their relationships with others, and the natural world (Pillemer, 1992). These findings support the established memory functions and demonstrate how the memory of a profound experience with nature can influence an individual's understanding of self, social relationships, and decisions and behaviors.

Reliving the Past. Participants were asked how often they think and talk about their profound experiences. The findings indicate that the memory of a profound experience with nature is present within each of the participants serving as a guide or inspiration in their lives. Participants either think about their profound experience with nature often and use the memory on a regular basis, or reflect upon the memory of the profound experience when a current situation triggers it.

With the broader goal of understanding the role of memories in addressing the goals of environmental education, Liddicoat and Krasny (2014) similarly explored how often participants think or talk about their residential outdoor education experiences. Their findings confirmed that the memories influenced participants' behaviors toward the environment, social interactions with friends and non-participants, and serves as a recollection of a positive experience. Liddicoat and Krasny (2014) suggested that the memory of the experience is also "a possible mechanism through which the experience can continue to have an impact" (p. 189). This finding indicates the memory is still present within the participants.

No other study to my knowledge questioned participants about how often they think or talk about the profound experience; however, the fact that SLE research and studies of other profound experiences (Brymer et al., 2009; Caston, 2014; Cohen et al., 2010; Keltner & Haidt, 2003; Merrick, 2008; Perrin et al., 2018; Williams & Harvey, 2001) are retrospective and rely on participants recalling a past experience, suggests the memory is still present and thus warrants more research to understand under what circumstances and how often participants think or talk about their profound experiences.

Comparison of Major Themes to Memory Functions

The findings of this study reveal that memories of a profound experience with nature can serve self, social, and directive functions. Four themes emerged from the data: becoming authentic, changing social relationships, living with meaning, and reliving the past. These themes support the three functions of autobiographical memory as discussed in the literature. As a qualitative researcher, I sought not only to confirm that this framework was applicable to memories of profound experiences with nature, but also to determine whether memories of this type could be used in ways other than the three established functions. Hence, I sought to learn how individuals understood the influence of the experience on their lives and how they believe they use their memories of a profound experience with nature.

Self. Participants used the memory of the experience to understand who they are as a person. They reflected on who they were before their profound experience, who they were after, and how this may or may not have changed. The memory function literature documents this process as the self function, in which individuals consider which events from their past shaped who they are today, as well as the importance of those episodes in defining the individual in the present (Bluck et al., 2005; Kihlstrom, 2009). Participants recounted looking back on their

profound experience and considering if and how their sense of self has changed over time, consistent with the concept of self-continuity in the memory function literature (Bluck et al., 2005; Brewer, 1986; Conway, 1996; Fivush, 1998; Neisser, 1988). In essence, participants use the memory of their profound experience to gain a better understanding of who they are over time, confirming that memories of profound experiences fulfill the self function of autobiographical memory.

Social. Sixteen of the 21 participants (76%) shared the memory of their profound experience with another person in some capacity. This finding reflects the social function of autobiographical memory, which serves to create social interaction, empathy, and social bonding (Bluck & Alea, 2002; Bluck et al., 2005; Cohen, 1998; Kihlstrom, 2009; Pillemer, 1992). Participants shared their stories with loved ones, acquaintances, students, coworkers, clients, or the general public. They shared the memory of their profound experience to establish intimacy and invite others to understand them at a deeper level, bond with others over similar experiences, share a love for the natural world, and to educate (Table 8). By sharing their memories, these individuals established a vital form of social interaction that binds individuals together.

Table 8 *Sharing the memory of a profound experience with nature*	Number of Participants
To establish Intimacy	6
To bond over a similar experience	3
To share a love for the natural world	1
To educate/Job	6
Did not share	4
Did not answer the question	1
Total	21

As described earlier, four of the 21 study participants (19%) had never mentioned their profound experience to anyone before the interview. These individuals expressed that their

profound nature story was too personal or too emotional to share with others. This finding is represented in other studies of related experiences (Caston, 2014; Merrick, 2008). The decision to not share the memory of a profound experience with others is in contrast to the social function of autobiographical memories. The act of sharing personal stories from one's past encourages the development, maintenance, and enhancement of social bonds and fosters intimacy between the speaker and the listener (Alea & Bluck, 2003; Alea & Bluck, 2007; Neisser, 1988; Nelson, 1993; Pillemer, 1998). While I did not probe deeper into the reasons why individuals did not share their experience with others, perhaps the alternative benefits of keeping the memory to oneself supersede any social benefits of sharing it. For example, some individuals may not fully understand what happened to them or how it changed them. They may need time to grasp what the moment was and the ramifications of it. Alternatively, perhaps keeping the memory of the profound experience to themselves allows these participants to savor the memory of the experience and recognize it for all it was and all the ways it changed them. While people who did not share were only a small proportion of participants, further investigations into the reasons for keeping the memory of a profound experience to oneself may lead to a deeper understanding of the role these memories play in people's lives.

Directive. These findings support that profound experiences fulfill the directive function of autobiographical memory, as demonstrated by all 21 participants using the memory of their experience when making present and future decisions (Bluck et al., 2005; Liddicoat & Krasny, 2014). Participants reflected on their memory when making everyday decisions such as where to shop, what to buy, or how to spend free time, as well as when making bigger decisions such as what academic path to pursue or graduate program to attend, what career track to follow, or even major life shifts. These findings exhibit the directive function of autobiographical memory,

consistent with the memory function literature (Bluck & Alea, 2002; Kihlstrom, 2009; Pillemer, 1992).

Possible fourth function of autobiographical memory: developing and appreciating relationships with other-than-humans. A profound experience with nature did not just affect social interactions with other humans; it also affected relationships with other beings. Four study participants (19%) reported an object in nature as a part of their profound experience. An object of interest was also present in studies of related experiences such as environmental epiphanies (Merrick, 2008) and aesthetic experiences (Chenoweth & Gobster, 1990). Caston (2014) also found that participants in his study had "an affinity for specific entities within the environment such as the details of a plant, interacting directly with a domestic or wild animal, or an aesthetic response to the grandeur of nature" (p. 95). Likewise, respondents in Perrin et al.'s (2018) study of human-wild animal interactions all involved a wild animal.

What sets my findings apart from previous studies is that the natural entities served a greater purpose than merely being an object of interest. In all cases, the participants described an intimate interaction with the other being. Participants expressed awe, joy, love, empathy, connection, and shared energy with these other-than-humans. The feelings and sentiments they conveyed toward these others are almost exclusively used when speaking about human relationships, yet for the participants in this study, they believed what they experienced was real.

For example, Hope described her interaction with the cuttlefish as more than just seeing a new species. It was a moment in which she felt an intense connection, as if she had been chosen by this particular creature. She no longer felt separate from the rest of nature, but intimately connected to all of nature. Hope felt confused by what she was feeling in the moment. Intellectually she tried to justify why she had this experience with this one individual cuttlefish,

yet emotionally, deep within herself, she felt special because she was chosen by this creature. Similarly, Chad described his time with the deer as a moment of mutual connection: he was interacting with the deer, and the deer was interacting with him. Chad portrayed immense excitement and emotion as he reflected on this memory. The connection with the deer moved him in such a way that it changed the way he interacts with nature and has prompted him to share the memory of this profound moment at any opportunity that he can.

Louv (2019) explored human-animal coexistence and how these relationships can be mutually beneficial for both humans and animals. Many of the human-animal encounters documented in the book are similar to Hope and Chad's profound experiences, and confirm the intimate interaction possible between humans and animals.

Two participants described feeling connected to an inanimate object in nature. Mary's experience with the rock on her grandmother's farm was a moment that has become a prominent fixture in her life. She uses visualizations and meditations to visit the rock in her mind whenever the adult stresses of her life get to be too much. Mary considers the rock to be a friend, a place of support, safety, and warmth, and believes that she was part of the rock and the rock was part of her. The rock and Mary were one. They bonded in such a way that she could not tell her own body from the body of the rock. Similar to Mary's oneness with the rock was Lindsay's visceral connection with the volcanic rocks. Not only did Lindsay fall in love with the rocks on the side of the volcano, but also she empathized with the rocks. She acknowledged they had had their own experiences, and at that moment, she and the rocks were sharing an experience. They were together in that time and place. Lindsay felt the connection viscerally with her whole being.

As described above, four study participants (19%) reported feeling connected to a specific entity of nature, either living or nonliving. Whether it was Hope and the giant cuttlefish,

Chad and the white-tailed deer, Mary with her rock, or Lindsay with the volcanic rocks, an object in nature was a part of their profound experience and participants felt connected to it. The connection these individuals felt with the other beings was unexpected, yet felt natural and mutual. These participants felt they were experiencing the other, and the other was experiencing them.

Whether one believes a rock, or a deer, or a cuttlefish, or nature as a whole has an awareness (or an energy, or that everything is connected on an invisible level), one must acknowledge that these experiences were both profound and real to those who experienced them. These individuals experienced love, connection, and comfort from these species or inanimate objects, and are still reaping the benefits of the profundity of their experience. The current memory function research focuses exclusively on human-human relationships and fails to include social relationships with other-than-humans such as animals, plants, and inanimate elements of nature like rocks. This failure of memory research to acknowledge the nonhuman world demonstrates a need a fourth function of autobiographical memory. This potential new memory function, of enhancing social connection between humans and nonhumans, is one that warrants more in-depth exploration to understand the effects of an intimate connection with an object in nature as part of profound experiences. Also important to consider is how adding a fourth function of autobiographical memory may change our understanding of the other three functions.

Implications

The findings of this study demonstrate that a singular and meaningful experience with nature has the potential to be influential and useful in an individual's life. For the participants in this study, a profound experience with nature forever changed their lives, whether in momentous,

life-altering ways, or smaller yet still meaningful ways. These self-reported effects include a new understanding of self, changes in social interactions, a deepening of their relationship with the natural world, and a desire to live a more meaningful and intentional life. These effects proved to be powerful and long lasting.

Connection to nature. At a time in human history when society is becoming more urbanized and distanced from nature, it is vital to understand those experiences that can bring people closer to nature. For the study participants, a profound experience with nature did just that. These individuals expressed feeling connected to all of nature, individual organisms, and inanimate objects found in nature**.** A profound experience with nature awakened a sense of interconnectedness among all living and nonliving components. This enhanced relationship with the natural world proves to be essential to the individual and the planet as a whole. These findings may have implications for ecopsychologists who are concerned with studying the often unconscious rift between humans and the rest of nature. Ecopsychologists have been successful in encouraging individuals to become aware of who they are and their place in the world, to reawaken the senses, and to recognize the interconnectedness of all living beings. While more research is needed to understand the conditions during which a profound experience occurs, the knowledge that a profound experience with nature has the potential to shift a person's view of or relationship with the natural world offer ecopsychologists another avenue for healing the human-nature relationship.

Social relationships. Study participants described changes in their social interactions with other humans after their profound experience with nature. Two profound experiences recounted in this study gave rise to a deeper sense of connection with other humans, while three participants spoke of how they felt a disconnect with other humans after their profound

experience. This finding suggests that relationships with the natural world may distance some people from the human world. No other study to my knowledge has reported a similar finding, indicating that this is a research area warranting more exploration. SLE scholars can investigate the conditions under which a person may feel more distanced from other humans after a profound experience.

A profound experience with nature did not just affect social interactions with other humans; it also affected relationships with other beings. After their profound experience, four participants reported feeling connected to a specific entity of nature, either living or nonliving. The memory function literature highlights the social function of autobiographical memories (Bluck & Alea, 2002; Bluck et al. 2005; Kihlstrom, 2009; Pillemer, 1992), but this exclusively refers to interpersonal relationships and interactions with other humans. Research on the social function of autobiographical memory lacks any mention of social interactions or relationships with 'others' besides humans. The findings from this study offer a possible fourth function of autobiographical memory: developing and appreciating relationships with other-than-humans. Previous research in the field of wildlife tourism indicate that viewing wildlife contributes to an intense and memorable human emotional experience (Curtin, 2010; DeMares & Krycka, 1998). Likewise, wildlife encounters have the potential to encourage feelings of awe, spirituality, and inspiration (Farber & Hall, 2007; Davis & Gatersleben, 2013). Consequently, profound experiences involving intimate encounters with nonhuman animals have the potential to "reawaken our connection and love of nature" (Curtin & Kragh, 2014, p. 550), which memory function scholars and ecopsychologists alike should be interested in exploring more.

Environmental education. Study participants recounted profound experiences with nature occurring both in childhood and adulthood, the majority of which happened in a place or

during an activity familiar to the participant. This finding indicates that people do not have to be immersed in wild nature or engaging in new activities; a profound experience can happen anywhere, at any age. Environmental educators strive to instill in their students an awareness, knowledge, shifts in values and concern for the environment, and the desire to take action for the environment. Wals, Geerling-Eijff, Hubeek, Van der Kroon, and Vader (2008) differentiated two approaches to environmental education: an instrumental perspective aimed at reversing negative environmental behaviors, and an emancipatory approach, which encourages individuals to think about environmental problems and establish their own ideas for solving them (Jickling & Wals, 2008; Mayer & Tschapka, 2008; Schusler & Krasny, 2010). Wu, Zhu, Chen, Ni, and Liu (in press) argue that programming with an emancipatory approach can achieve the goals of environmental education by encouraging individuals to reflect on the memory of the environmental education experience "for the purpose of understanding how they perceive their own gains and subsequent autonomous behavioral decisions" (p. 2). With this approach in mind, environmental educators can develop and deliver age-appropriate programming aimed at creating a memorable environmental experience, with the goal of creating lasting positive effects characteristic of a profound experience with nature.

The findings of this study demonstrate that a profound experience with nature has the potential to affect an individual's understanding of self, social interactions, relationship with the natural world, and overall life. These experiences are compelling, the effects are long lasting and should be researched more thoroughly.

Limitations of the Study

Purposeful selection process. I interviewed 21 individuals who responded to a recruitment flyer I shared with the Watershed Institute and the Ecological Teaching & Learning

graduate program. My population is small compared to the hundreds or thousands of individuals associated with the organization and school. Because of how I recruited participants, it was more likely they would be inclined toward nature, increasing the potential for them to have a profound experience with nature. The research design and questions were constructed to investigate only those singular and memorable experiences with nature that shifted an individual's view of or relationship with the natural world. I did not seek out participants who spent time in nature but did not have a profound experience. Hence, because of the small sample size, the purposeful selection process prevents generalizing my findings to the general public.

Lack of diversity. Another limitation of my study is lack of diversity. While my study included diversity in professional careers, it lacked diversity in other ways. All the participants identified as Caucasian, except for one who described herself as part Native American. The lack of gender, racial, and ethnic diversity limits the ability to learn about the effects of a profound experience on individuals of diverse demographic backgrounds. Recruiting from the general public or targeting specific demographic groups would have increased the potential for greater diversity in the study sample. After completing this research, I learned of outdoor groups with members of similar cultural identities such as Outdoor Afro, a network for African Americans who are connected to the natural world, Mosaic Outdoor Clubs for Jewish Americans who appreciate the outdoors, as well as various meetup groups with a cultural, religious, or an ethnic focus that also explored the outdoors. Recruiting from these types of outdoor groups would increase participant diversity.

Use of in-depth interviews. While in-depth interviews allow for delving deeper into responses and asking follow-up questions, interviews are laborious and limit the size of the sample. Likewise, because of the personal nature of interviews, some potential participants may

have chosen not to participate in the study, which was valid for one potential participant who decided to remove herself from the study because she felt recounting the experience would be too emotional. Utilizing a questionnaire to collect data on profound experiences and the subsequent effects is one way to accommodate potential participants who may shy away from in-person interviews or have time constraints and are unable to commit to a sit-down interview; however, researchers should use caution when considering a questionnaire. This form of data collection may limit the amount of detailed information, subtle unspoken forms of communication, and the ability to ask follow-up questions as is possible during an interview.

The majority (57%) of the interviews occurred in person, while the remaining interviews were conducted via webcam (29%) or phone (14%). The in-person and webcam interviews allowed me to see facial expressions and view body language. The telephone interviews prohibited me from capturing these nonformal forms of communication. Upon reviewing the interview transcripts, I found the data to be equally rich in all the interview formats, suggesting this limitation may have had minimal effects on my analysis.

Use of personal memories. All 21 participants recalled a profound experience with nature from their past and shared the memory and the subsequent effects. Using personal memories is a limitation of this study as concerns over the validity of memory to recall past events exist (Ross, 1997). Memory can be flawed, and individuals can remember memories differently at various points throughout their lives. Exploring the effects of a profound experience with nature through an interview may have affected what the participants shared. Participants may have felt the need to answer questions quickly, rather than taking time to reflect on how to answer deeply. One way to account for this limitation is to provide the interview

questions in advance, giving the participants time to reflect upon their answers before the interview.

Definition of term. Another potential limitation of my study is related to the definition of the term a profound experience with nature. Although the term was defined on the recruitment flyer and the informed consent form, during the interview I did not explicitly define the term or ask the participants for their definition or understanding of the term. In retrospect, I would have recommending asking the participants to explain what profound means to them and why they felt their experience could be considered a profound experience with nature.

Further Research Directions

This study provided initial insight into the lasting effects and memory functions of a profound experience with nature. With this new knowledge, new questions also arise. More research is needed to understand the potential benefits of this phenomenon.

As discussed above, one limitation of this study was the absence of an interview question prompting participants to define or explain their understanding of the term "a profound experience with nature." Future replications of this study should incorporate this question to further understand the range of meanings of a profound experience as described by participants.

Individuals from diverse demographic backgrounds are underrepresented in studies of profound experiences, an area of research that needs exploration to learn how individuals from these unique backgrounds understand the effects of such experiences. Future studies would benefit from incorporating the perspectives of underrepresented populations such as Hispanic Americans, African Americans, Native Americans, Indian Americans, as well as international participants. Equally important to explore is how class, gender, and rural versus urban

upbringing affect how participants come to understand the meaning and effects of their profound experiences.

Similarly, the role of culture should be investigated because what self means and the boundaries between self and the natural world can vary greatly from culture to culture. Thus, understanding the cultural background of a participant can elucidate what an individual considers profound, as well as how that an individual understands and describes the effects of a profound experience.

Research of profound experiences would also benefit from longitudinal studies, which investigate changes in the long-term effects of a profound experience with nature over time. This would be especially useful for those whose profound experiences with nature happened in the recent past. These individuals could be followed throughout their lifetimes to document how the experience affects them over time. Specifically related to memory, future research could investigate if and how the memory of the profound experience has changed over time. Longitudinal research examining the retention of flashbulb memories and event memories related to the September 11, 2011 attacks determined that while rapid forgetting occurred within the first year, the forgetting leveled off and did not significantly change 10 years after the event (Hirst et al., 2015). Researchers could utilize similar research methods to examine if and how memories of a profound experience with nature change over time and if the retention of the memories is similar to memories of other significant events.

Future studies could also investigate the conditions associated with having a profound experience with nature, such as the role of place, age, or solo versus group activities to understand what makes it the right “time” for the occurrence of a profound experience with nature. Upon reviewing my data, no specific condition “jumped out” as significantly determining

the likelihood of having a profound experience. Ten of the 21 experiences occurred with the participant was engaged in a solo activity, while 11/21 occurred during a group event. Similarly, 10 of the individuals were under the age of 20 at the time of their profound experience, and 11 were at least 21 years of age. The majority of the profound experiences (61.9%) happened in a place or during an activity familiar to the participant, indicating that novelty may not necessarily be an essential contributor to a profound experience. These findings suggest the need for more extensive studies to investigate what, if any, factors affect the likeliness of the occurrence of a profound experience with nature.

Similarly, future research can explore the potential of having a profound experience after participating in structured outdoor nature experiences provided by organizations such as Outward Bound or Natural Habitat Adventures. A key component of these experiential programs is an emphasis on slowing down, being present in the moment, and taking time for deep reflection. Future researchers can investigate the role of purposeful reflective time in an individual's understanding of the effects of a profound experience, as well as how these types of structured nature experiences affect the likeliness of the occurrence of a profound experience with nature.

An unexpected finding of my study was the disconnection from other humans described by four participants after their profound experience with nature. Future research could more deeply explore this disconnect to understand the circumstances under which individuals are driven away from, rather than brought closer to other humans. Researchers could investigate how frequently individuals feel disconnected from other humans after a profound experience, if these individuals had a preference for spending time alone rather than in social situations before the

event, and specific factors of the profound experience that contributed to feeling more or less connected to other humans.

Future studies may also investigate why some individuals chose to keep the memory of their profound experience private, and the consequences of that choice. While 17 participants shared their memory of their profound experience with others, four individuals kept the memory to themselves. These findings suggest the need to understand why some individuals do not share their experience. One such avenue for exploration may be internal motivation. Participants in this study noted that their profound experience prompted them to make significant changes in their lives or set new goals, or it shifted their understanding of who they are. Research could investigate if and how keeping the memory of a profound experience private may serve as an internal motivator to make these changes or achieve the goals initiated by the experience.

Another interesting direction for future scholars is to investigate the role of psychedelic drugs such as psilocybin (magic mushrooms or magic truffles), lysergic acid diethylamide (LSD), or N,N-Dimethyltryptamine (DMT) on the occurrences or effects of a profound experience with nature. Researchers can investigate the potential enhancing effects of micro-doses of these drugs (dosages around one tenth of the recreational or hallucinogenic dose) on a profound experience (Prochazkova et al., 2018).

Of utmost importance for future research is to further investigate the conditions under which a profound experience with nature is likely to occur. Caston's (2014) phenomenological study of the dynamics of transformative experiences with nature explored what occurs "within the mind and heart of a person as the experience unfolds" (p. 127). Caston (2014) identified the essential qualities of transformative experiences and the antecedents that influence how an individual perceives the experience. Research is needed to understand the conditions of the

experience itself that may affect the likeliness of the occurrence of a profound experience. This information could be used to inform environmental and outdoor educators who strive to craft programming that promotes positive environmental awareness and behaviors, similar to those experienced by individuals who had a profound experience with nature.

Conclusion

This research endeavor began because of a moment in the rain – a moment that forever changed my relationship with the natural world, my understanding of self, and how I live my life. My profound experience with nature led me on an academic journey to understand how others believe their profound experiences have impacted their lives. My extensive review of the literature on profound experiences revealed that while previous studies had investigated the characteristics of similar experiences or the long-term consequences of repeated experiences in nature, none specifically focused on the lasting effects of a single memorable experience with nature. Similarly, no previous study has used memory function as a framework to understand the influences of a profound experience with nature or how participants use the associated memories throughout their lives.

My study provides preliminary insight into the lasting effects and memory uses of a profound experience with nature. My findings illustrate that a single profound experience with nature can have long-lasting and significant effects on an individual. Specifically, a profound experience has the potential to encourage an individual's sense of self, define an individual's self-awareness about his or her relationship with nature and others, and promote environmental decisions and behaviors. These findings contribute to the fields of significant life experience and memory function.

Significant life experience research seeks to understand those formative experiences, which affect an individual in such a way that he or she commits to care and concern for the environment (Chawla, 1998b; Tanner, 1980). The research indicates that the most influential experiences that shape environmental attitudes, values, and behaviors are childhood outdoor exploration, participation in organized groups, family vacations, trips to environmental education or nature centers, memorable teachers or classes, books, and witnessing the destruction of a beloved natural space (Chawla, 1998a; 1999; Gunderson, 1989; James, 1993; Palmer, 1993; Peters-Grant, 1986; Sward, 1996). My findings make a valuable contribution to this area of research by demonstrating that SLEs do not require an extended period of time engaged with nature, but that a singular, memorable experience with nature *also* has the potential to shape an individual's relationship and behaviors toward the environment. Similarly, my findings illustrate that indirect as well as direct experiences with nature can be profound. SLE research has largely focused on direct experiences and should recognize the transformative powers of a single profound experience, whether direct or indirect.

The memory function literature identifies three functions of memory: self, social, and directive (Alea & Bluck, 2003; Bluck & Alea, 2002; Bluck et al., 2005; Kihlstrom, 2009; Pillemer, 1992). My findings support these functions by demonstrating how a profound experience with nature encourages self-awareness, shapes social interactions, and directs decisions and behaviors. Participants also described an enhanced relationship with the entirety of nature, other species, and inanimate objects found in the natural world. These findings suggest a possible fourth function of autobiographical memory: developing and appreciating relationships with other-than-humans. Recognizing the possibility of social relationships with beings other than humans can inform future studies of memory function.

This research demonstrates the power of a profound experience with nature. The 21 participants expressed the importance of their profound experience with nature in their life and acknowledged its presence and long-term effects. I am hopeful that this research offers new insight into how a profound experience with nature can encourage a new understanding of self, redefine relationships with others and nature as a whole, and promote meaningful and intentional decisions and behaviors.

At a time in human history when people are spending more time indoors than outside in nature, we are witnessing the impacts of disconnection from the natural world in terrible ways. We need to think about creating opportunities for reconnection with the natural world. A profound experience with nature and the resulting effects can connect people with nature at a time when we as a society need it desperately.

Final Thoughts

After devoting the past five-and-a-half years to learning about profound experiences with nature, I have emerged with a new understanding of this phenomenon. Before beginning my research, my view of a profound experience with nature was limited to my own experience. While I knew each experience described in this study would be unique and different, I could not have begun to fathom the extent to which the experiences would differ, nor the variety of effects described by the participants. I now recognize that a profound experience with nature can be directly experienced while in nature, indirectly through a book or a window, or even experienced in the mind. The results can vary from a deeper appreciation for the natural world, to a connection with the greater world, and even to feeling love for and love from other-than-humans. The great diversity of profound experiences and resulting effects is unexpected and astonishing.

Similarly, my interpretation of my own moment in the rain has changed. In an instant, my life changed. Positive emotions of joy and love flooded my body, resulting in an inner peace I had never felt previously and have only felt a few times since. My body felt calm and alive simultaneously. I became instantly aware of the interconnectedness of all living beings. My body, my mind, and my soul started to become one with the world around me. Where I was once seeing only objects, I now saw beauty; colors, shapes, and textures now appear brighter and sharper to me.

I cannot describe how long my moment lasted, but the impacts of it are still with me today. My environmental values, attitude, and behavior all stem from this moment. In my personal life I strive to be a positive environmental role model for my children and others. I try to live lightly on the earth, respect all life, and make healthy choices for the planet and my family. My moment in the rain allowed me to see the world in a new and incredible way. Daily, I see, feel, and experience joy and beauty in nature. I have such gratitude for my profound experience with nature and how it has positively impacted my life.

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Appendix A: Recruitment Flyer

Profound Experiences with Nature

Research Participants Needed

Have you had a **profound experience with nature that shifted your view of the natural world or your relationship with it?** If so, I'd like to interview you to learn about what you experienced and how it has influenced your life. I am interested in learning about direct and indirect experiences with nature. This means your experience may have occurred outside in nature, or indoors with a film or book, or some other encounter that shifted your view or relationship with the natural world. The experience you share should be memorable and one you are willing to recall. It could be an enlightening experience – one in which you have learned something new about yourself or the world around you. Or, perhaps you felt personally transformed by the experience. If you had a memorable experience with nature that was illuminating or transforming, I would love to hear your story!

If you are at least 18 years old and interested in sharing your profound experience with nature in an interview, please provide your contact information here or you can copy and paste the following link in your web browser https://www.surveymonkey.com/r/3QLPZGT
I will contact you within a few days to confirm your interest in participating.

Thank you for considering the opportunity to be part of my doctoral research at Antioch University New England.

With gratitude,

Becky Mathers
Environmental Studies Doctoral Candidate
Antioch University New England
[redacted]

Appendix B: Interview Protocol

Introduction: Thank you for your willingness to participate in my study about "Profound Experiences with Nature." As a reminder, your participation in this study is voluntary. You can choose not to participate at any time for any reason.

Purpose: The purpose of my study is to explore your memories of a profound experience with nature and how it may have influenced you. This interview is part of my dissertation research in which I am seeking to learn about unforgettable experiences with nature. I wish to learn how people use the memories of these experiences in their lives and how the event might have changed people's relationships with nature.

All information you share with me will remain confidential and safe. Audio recordings of the interviews will be transcribed and then deleted. The results of this study may be shared in reports, articles, books, papers, and/or presentations. Your identity will be protected in any publication.

Interview Date and Time:

Interview Location:

Method (In-person/Webcam):

Interviewer: Becky Mathers

Interviewee:

First, I would like you take a few minutes to think about your profound experience with nature in as much detail as you recall. (pause) Now, try to describe it in as many details as possible.

Guiding Questions

- Why do you think it was a memorable experience?
- What meaning/significance/importance does this particular experience hold in your life?
- Has the meaning of this experience changed over time? If so, how?
- Do you see yourself differently than before the experience? If so, how? If not, why not in light of you describing it as a profound experience?

Additional Prompts

Time:
When did the experience happen? (Date/Time)
What was your age at the time?

Experience:
What was the value of this experience compared to other significant life events?
During the experience, what if anything, did you hear, see, or experience emotionally?

After effects:
How would you describe the effects this experience had on you?
Have you made any significant changes in your life that you attribute in some way to this experience?
How often do you think or talk about your experiences? For what reasons? With whom?

Other Epiphanies:
How many experiences like this have you had beside the one you have been describing?
How do you attribute those experiences to how you are today?

Conclusion/Additional Information:
What questions, if any, do you think I should ask or that I haven't asked that might do a better job at understanding your profound experience and its influence on your life?

Demographic Information

Are you: *Male* *Female* *Other* *Prefer not to answer*

In what year were you born: _____
Highest level of education: _____
Type of employment: _____
Are you a member of a nature-based organization? *Yes* *No*
If yes, which one(s): _____

Where do you currently live? (City or town, state)

What setting best describes where you live? *Urban* *Suburban* *Rural* *Other*

Appendix C: Initial Coding Guide

Themes	Sub-themes	Nodes	Quotes	Participant
Change in perspective	self	self-confidence and deepening of one's self-identity	I think on some kind of like some kind of subconscious level, you can draw on those experiences that make you feel strong.	Ruth
	world	possibility of some greater meaning and reason for life; a connection to something greater than oneself	But this one maybe reinforced that bad side of things, which is that not everybody sees the world the way I do.	Joseph
	relationship with others	realization of the conflict between humans and the rest of nature; stark differences in lifestyle choices; a newfound appreciation for other humans	I would say the most profound thing about it was that I was trying to get away from human species and found that it rekindled my hope for the human species.	Kyle
	relationship with nature	interconnectedness, visceral connection, everything has energy, deeper appreciation	I've been missing out on this feeling of, this is another layer of connection with the land that when I think of profound, that's what it layer of that profoundness.	Lindsay
Change in lifestyle	how to spend free time	books to read, recreating, political activism	It helped me refocus. Within Rolling Harvest there was a tendency to not be involved as a political activist.	Jeffrey
	where to spend money	shopping, food choices, vehicle choice	Definitely since then, I've been obsessed with buying local food...But the shopping thing for foods that I thought would align with my vision of ideal working conditions.	Erin
	how to use of resources	general environmental behaviors	I compost now... I don't know if we particularly buried our organic waste on that trip, but you know, it definitely kinda led me down that road.	Julie
Change in life path	significant life changes	escape bad situation (abusive family life, self- destructive behaviors); get life back on track (stop drinking alcohol, new start)	My life took a very exciting turn and it all kind of got generated from making that one decision to go into the foster home because that memory was so striking and so clear.	Susan
	career choice	new career, reinforced current career, refocused career	I guess that just excited me more about a career path that I was choosing of being able to apply those skills and look at something in that kind of detail. It definitely solidified the career path I wanted to take.	Jonathan
	academic plans	reinforced academic path, opened a new path	I didn't really even know that this field existed until I found this posting, and I was like, "That's what I want to do. That's what I want to focus on."	Michelle
Used as a Reminder	in times of stress	to be present	I think that it is something I can actually tap into when I'm needing that reminder to be present, to just be in that silence.	Hope
		to slow down	I think it's just so important to slow down… And when I go paddle boarding, I just go really slowly because I just wanna absorb everything I'm seeing, everything that's around me.	Hope
		to calm self	It's a very happy memory...it's sort of something that I can that I use to try and calm myself...I'm one of those people, I'll get flustered. Not- or I worry a lot... it's… just a very peaceful scene. It's a very peaceful place.	Nicholas
		to feel safe	So, today I go to "The Rock" regularly at any time I want and I look out...It's a haven where if I'm feeling overly stressed, I go to my Rock in my safe haven.	Mary
	decision-making	to guide behaviors	It's kind of sub- subconsciously built-in now. It kind of guides a lot of my choices and preferences and what I look at and look for and I guess the contents I curate.	Julie
		as a source of inspiration/advice	I definitely use it as a source for inspiration or advice or whatever, for all of the folks I talk to, for sure.	Kyle
		to feel strong	I think on some kind of like some kind of subconscious level, you can draw on those experiences that make you feel strong.	Ruth
		to gain confidence	I like to hearken back to it and remember it from time to time...I remember it, and I think try to incorporate it. I try to say, "Let's see if I could have that feeling regarding this other circumstance."	Susan
		to be more careful with nature	It also made me realize that we need to be more careful because some of the things in the past.	Kim
	sharing	with children, friends, neighbors	As my children have grown up I've tried to pass that on to them and teach them about the importance of taking care of and respecting the animals and the trees.	Kim

		Teaching	As a science teacher, I share this story every year with my students.	Chad
		Songwriting	I'm a singer-songwriter... that visceral connection with the natural world and with the world around me... with other than human world, more than human world, whatever you want to call it, that visceral connection with the world is a huge part of my songwriting capacity	Lindsay
	encouragement	to do something/act	Sometimes that feeling would always come back to me when I was in the car backseat driving on those busy roads going, "Ah." That reminder, as in, "You know, should do something about that one day"	Ashely
		that it is never too late to learn something new	It literally showed me that you can learn anything or change something that you think is pretty deeply entrenched at any time and that is a really good thing to know.	Melanie
		that I can do anything	You don't always remember to, but I do think that when I need to, I know that I can do anything.	Ruth

Appendix D: Informed Consent Form

Date:

To: Research Participant
From: Becky Mathers, Researcher

RE: Consent to Participate (please read and sign)

Dear Research Participant,
Thank you for your willingness to participate in my study about "Profound Experiences with Nature." The information in this letter is to help you understand the purpose of the study and how you can help! Your participation in this study is voluntary. You can choose not to participate at any time for any reason.

Purpose
The aim of this work is to learn about unforgettable experiences with nature. I wish to learn how people use the memories of these experiences in their lives. I am also interested in how the event might change people's relationships with nature.

The Study
I will conduct an interview with you. The interview will last approximately 1 hour. During this time you will describe your experience and the effects. With your permission, the interview will be audio recorded.

Collected Information
All information you share will remain confidential and safe. Audio recordings of the interviews will be transcribed and then deleted. The results of this study may be shared in reports, articles, books, papers, and/or presentations. Your identity will be protected in any publication.

Possible Risks
The risks associated with your participation in this study are minimal. You may stop the interview at any time for any reason.

Questions or Concerns
If you have any questions about your rights as a research participant, you may contact [redacted], Chair Antioch University New England IRB at [redacted] or [redacted], AUNE Interim Provost, at [redacted]

I greatly appreciate your participation in this research and your willingness to share your story! I can be reached at:

Becky Mathers
[redacted]

Research Participant's Informed Consent

If you want to participate in this study, "Profound Experiences with Nature" please sign below. Your signature indicates that you understand the research, the activities expected of you as a participant, and are aware of any risks related with your participation.

I am at least 18 years of age. I have read and understand the above consent and agree to participate in this study. (You will be given a copy of this consent form for your personal records).

_____	_____
Participant Name (Please print clearly)	Email address
_____	_____
Signature of Participant	Date

Appendix E: Permissions

Becky Mathers [redacted]
to Dan

Mon, Mar 16, 10:09 AM (6 days ago)

Dear Dr. Caston,
I emailed you in the past to ask permission to use an adapted version of your interview guide used in your study on transformative experiences with nature, which you granted me (thank you again). I was told I need to add some additional language about where my dissertation will appear to my request. Below is an updated request for permission to use an adapted version of your interview guide and research questions in my dissertation.

I am a Ph.D. candidate in Environmental Studies at Antioch University New England, in Keene, NH. My dissertation research focuses on the lasting effects of a profound experience with nature, an experience with nature that shifts an individual's view of or relationship with the natural world.

I am writing to seek permission to use an adapted version of your interview guide used in your study on transformative experiences with nature May I have your permission to use an adapted version of your interview guide in my research and printed in my dissertation? My dissertation will appear in 1) Proquest Dissertation and Theses Database (www.proquest.com); 2) Ohiolink Electronic Theses and Dissertation Center (http://etd.ohiolink.edu); 3) AURA (Antioch University Repository and Archive) (https://aura.antioch.edu); and a printed hard copy for my files.

Thank you so much. Your work has had a significant impact on my research.

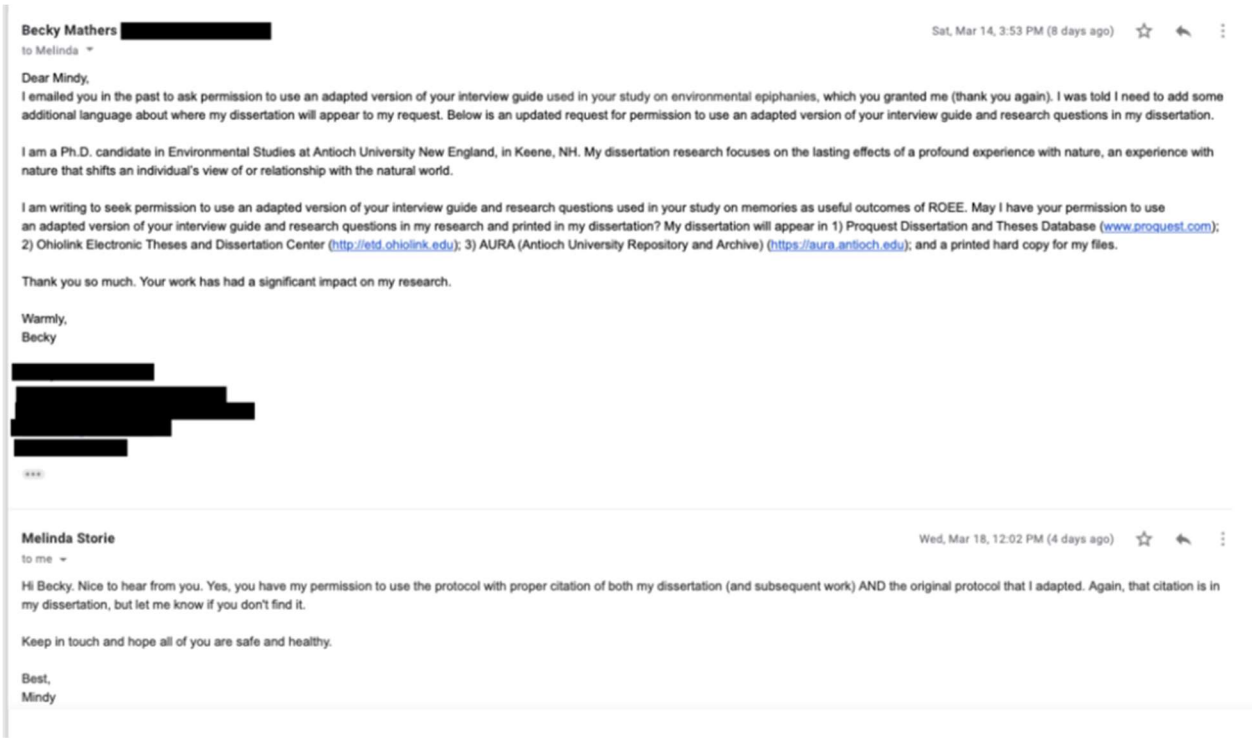
Warmly,
Becky

[redacted]

Dan Caston
to me

Mon, Mar 16, 10:27 AM (6 days ago)

Hi Becky-
I grant permission to use an adapted version of the interview guide found in my dissertation.
Dan Caston
Take care of your goodness!



Becky Mathers [redacted]
to Melinda

Sat, Mar 14, 3:53 PM (8 days ago)

Dear Mindy,
I emailed you in the past to ask permission to use an adapted version of your interview guide used in your study on environmental epiphanies, which you granted me (thank you again). I was told I need to add some additional language about where my dissertation will appear to my request. Below is an updated request for permission to use an adapted version of your interview guide and research questions in my dissertation.

I am a Ph.D. candidate in Environmental Studies at Antioch University New England, in Keene, NH. My dissertation research focuses on the lasting effects of a profound experience with nature, an experience with nature that shifts an individual's view of or relationship with the natural world.

I am writing to seek permission to use an adapted version of your interview guide and research questions used in your study on memories as useful outcomes of ROEE. May I have your permission to use an adapted version of your interview guide and research questions in my research and printed in my dissertation? My dissertation will appear in 1) Proquest Dissertation and Theses Database (www.proquest.com); 2) Ohiolink Electronic Theses and Dissertation Center (http://etd.ohiolink.edu); 3) AURA (Antioch University Repository and Archive) (https://aura.antioch.edu); and a printed hard copy for my files.

Thank you so much. Your work has had a significant impact on my research.

Warmly,
Becky

[redacted]

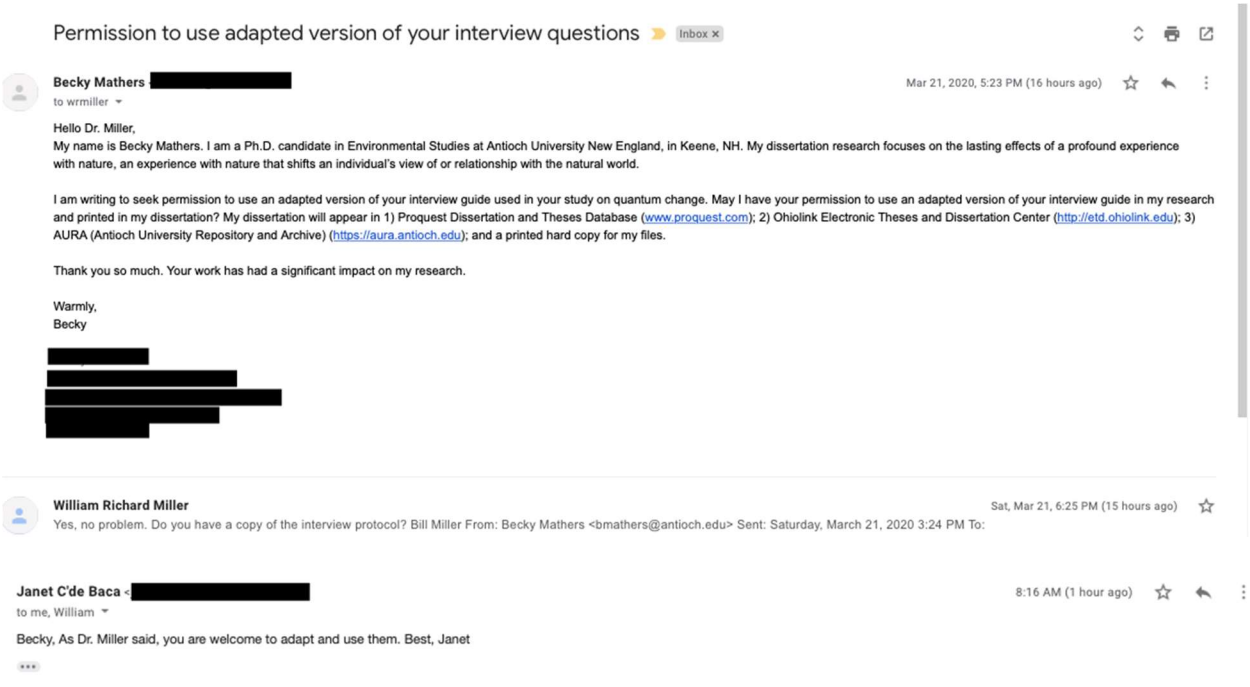
Melinda Storie
to me

Wed, Mar 18, 12:02 PM (4 days ago)

Hi Becky. Nice to hear from you. Yes, you have my permission to use the protocol with proper citation of both my dissertation (and subsequent work) AND the original protocol that I adapted. Again, that citation is in my dissertation, but let me know if you don't find it.

Keep in touch and hope all of you are safe and healthy.

Best,
Mindy



Permission to use adapted version of your interview questions Inbox ×

Becky Mathers [redacted]
to wrmiller

Mar 21, 2020, 5:23 PM (16 hours ago)

Hello Dr. Miller,
My name is Becky Mathers. I am a Ph.D. candidate in Environmental Studies at Antioch University New England, in Keene, NH. My dissertation research focuses on the lasting effects of a profound experience with nature, an experience with nature that shifts an individual's view of or relationship with the natural world.

I am writing to seek permission to use an adapted version of your interview guide used in your study on quantum change. May I have your permission to use an adapted version of your interview guide in my research and printed in my dissertation? My dissertation will appear in 1) Proquest Dissertation and Theses Database (www.proquest.com); 2) Ohiolink Electronic Theses and Dissertation Center (http://etd.ohiolink.edu); 3) AURA (Antioch University Repository and Archive) (https://aura.antioch.edu); and a printed hard copy for my files.

Thank you so much. Your work has had a significant impact on my research.

Warmly,
Becky

[redacted]

William Richard Miller
Yes, no problem. Do you have a copy of the interview protocol? Bill Miller From: Becky Mathers <bmathers@antioch.edu> Sent: Saturday, March 21, 2020 3:24 PM To:

Sat, Mar 21, 6:25 PM (15 hours ago)

Janet C'de Baca [redacted]
to me, William

8:16 AM (1 hour ago)

Becky, As Dr. Miller said, you are welcome to adapt and use them. Best, Janet