2018

Developing Ecological Citizenship: The Role of Political Agents Using Bronfenbrenner's Bioecological Model

Teresa Victoria Grabs
Walden University

Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

Teresa Grabs

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Joshua Ozymy, Committee Chairperson,
Public Policy and Administration Faculty

Dr. Christopher Atkinson, Committee Member,
Public Policy and Administration Faculty

Dr. Lynn Wilson, University Reviewer,
Public Policy and Administration Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2018

Abstract

Developing Ecological Citizenship: The Role of Political Agents Using Bronfenbrenner's Bioecological Model

by

Teresa Grabs

MPA, Capella University, 2015

BS, University of Utah, 2011

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy and Public Administration

Walden University

May 2018

Abstract

Despite decades of research on environmental behavior, it is unknown how various political actors aid in the development of ecological citizenship (EC). The purpose of this correlational study was to determine the relationship between environmental worldview (NEP) and willingness to take action (WTTA) among political actors within 5 states: Iowa, Kansas, Nebraska, South Dakota, and North Dakota. The overarching research question examined how EC can be increased within the 5-state region by identifying the similarities and differences in NEP and WTTA between state legislators, state partners, and nongovernmental organizations (NGOs). Bronfenbrenner's bioecological model provided the theoretical framework for the study. Out of 1,800 invited participants, 117 state legislators, 328 formal partnership directors, and 237 NGO administrators from the 5-state region participated in an online survey that measured their NEP, WTTA, and endorsement of EC principles. Nearly 20% of all respondents endorsed EC indicated by a high NEP and a high WTTA. Results of correlational analyses found a significant positive relationship between NEP and WTTA for each group. Further regression analysis found variation in group WTTA attributable to NEP varied from 32% for partnership directors and 36% for NGO administrators to 61% for state legislators. These findings indicated that EC can be affected by both private and public stakeholders. The implications for positive social change include demonstrating how state governments, in partnership with NGOs and other agencies, can increase EC within their states, and how improved partnerships can increase local opportunities to foster EC.

Developing Ecological Citizenship: The Role of Political Agents Using Bronfenbrenner's Bioecological Model

by

Teresa Grabs

MPA, Capella University, 2015

BS, University of Utah, 2011

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy and Public Administration

Walden University

May 2018

Dedication

I would like to dedicate this dissertation to my family, without whom it would never have been finished.

Acknowledgments

I would like to thank Dr. Ozymy for agreeing to be my chair and for putting up with the many roadblocks I created. It was a long journey, but I would never have finished without you. I would also like to thank Dr. Atkinson for serving as my committee member. I hope other students have the pleasure of working with both of you in the future. This dissertation could not have been completed without the hard work and critique of Dr. Wilson. I am indebted to all three of you.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Introduction

Less than 5% of the North American grasslands, also known as the North American prairie, remain because of increased agricultural production, urbanization, and other human activity (National Park Service, 2016; Pieper, 2005; WWF, 2016). The United States protects less than 1% of the remaining grasslands through the National Park Service (National Park Service, 2016), which places protection and reconstruction of the ecosystem primarily on states, organizations, and individuals within in that region (United Nations Environmental Programme, 2012). The ecological citizen accepts personal responsibility for the health of the ecosystem and its role within the global environment through demonstrating proenvironmental behavior and participating in the political system to ensure a healthy environment for future generations (Dobson, 2003; Howell, 2013; Wolf, Brown, & Conway, 2009).

Several studies have focused on individual proenvironmental behaviors such as bird watching (Cox & Gaston, 2016) and visiting local parks (Muratet, Pellegrini, Dufour, Arrif, & Chiron, 2015; Shwartz, Turbé, Simon, & Julliard, 2014), as well as how social constructs (Shapiro et al., 2016; Soga, Gaston, Yamaura, Kurisu, & Hanaki, 2016) and an innate desire to connect with nature (Wilson, 2009) aid in the development of proenvironmental behavior, but none have focused on how ecological citizenship is developed and how states, organizations, and political systems influence its development. Understanding how external influences modify internal behavior will aid in the development of policies and programs that garner more support from individuals while

supporting an increase in personal awareness and concern for the community's environment.

In this quantitative study, I will focus on the role of the state, formal state organization partnerships, and nongovernmental organizations (NGOs) in the development of ecological citizenship within North Dakota, South Dakota, Nebraska, Kansas, and Iowa. These five states' borders are fully within the North American grasslands and represent the last stand to protecting and rejuvenating this vital global biome. Grasslands, like forests, are essential to carbon sequestration and are vital participants in the carbon cycle (Freedman, 2014; Paustian et al., 2016; Smith, 2014). Smith (2014) argued that public policy and biome management are essential to maintaining the environmental impact of grasslands on the carbon cycle and its ability to store carbon. Both Freedman (2014) and Smith (2014) noted that although strong public policy and managed land use can be effective, individuals within the region also contribute to the role of the biome within the carbon cycle. One goal of the ecological citizen is to reduce individual ecological footprints, which supports the role of the grasslands within the carbon cycle. The results of the current study promote positive social change by increasing the body of knowledge regarding the development of the ecological citizen that will help agencies and organizations create action plans that will promote individual participation and augment political actions aimed at improving the health of the grasslands ecosystem.

Improved understanding of the role state legislators and agents, state organization partnerships, and NGOs have in the development of ecological citizenship will also help

international organizations develop programs that promote the individual call to collective action. In this chapter, I present a background of the problem and how I address the gap in understanding of how ecological citizenship is developed. I also provide a brief overview of the bioecological model that will frame this study and assist in the development of the research questions. I then define assumptions, limitations, and delimitations.

Background of the Study

Contemporary environmental policy is the result of a long, slow social process that began with environmentally aware individuals such as John Evelyn, William Bartram, Henry David Thoreau, John Muir, and Rachael Carson. Carson's *Silent Spring* (1962) is often viewed as a driving force behind the environment's most recent transition from social issue to national issue. Global policies, such as the World Heritage Convention (1972), Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973), and Convention on Biological Diversity (1992), and national policies, such as the Endangered Species Act of 1973 (2016), Clean Air Act of 1963 (2016), and the National Environmental Policy Act of 1969 (2016), create a unified view on environmental need from a political perspective. This new political perspective drove new global discussions on citizenship and its role in environmental protection.

Two main perspectives of the environment and citizenship exist. The first view is a classical liberal view in which citizenship is a byproduct of being a member of the community (Marshall, 1950), and the second view, the civic republican view, involves "a commitment to the common good" (Dobson, 2007, p. 280). Melo-Escrihuela (2008)

expanded on these perspectives to include the role of the individual in environmental protection. The contemporary division in environmental citizenship literature and theory follows Melo-Escrihuela's division in which individuals either have a personal duty to help the environment through proenvironmental behavior, or actively participate in protecting the environment through personal and political processes (Schild, 2016).

Environmental citizenship exemplifies the personal duty perspective and the emphasis on proenvironmental behavior with a local context (Bell, 2005). Bell (2005) described the environmental citizen as acting "differently for the sake of the environment" (p. 180) by recycling, repurposing items, and using mass transit. However, environmental citizenship goes far beyond personal behavior and enters the political process as a complex identity subject to ideological interpretation (Bell, 2005). Dobson (2003) argued that environmental citizenship is liberal in nature, relies on rules and regulations to elicit proenvironmental behavior, and exists "exclusively in the public space" (p. 89), and so another form of citizenship is required to address environmental need within the political space (Dobson, 2003). This new form of citizenship is ecological citizenship.

Ecological citizenship is a form of postcosmopolitan citizenship that is "nonreciprocal" and "nonterritorial" in nature where political space includes the public and private realm (Dobson, 2003, p. 82). As with environmental citizenship, ecological citizenship has been subject to challenges because of differing political interpretations (Hayward, 2006; Isin & Wood, 1999); however, many studies have demonstrated how ecological citizenship can directly influence the public and political realm. Like

environmental citizenship, ecological citizenship is not easily conceptualized, but it does have a clear set of tenets. At its core, ecological citizenship, and individual ecological citizens "know that today's acts will have implications for tomorrow's people" (Dobson, 2003, p. 106) and "will avail themselves of the opportunities for collective action with which political systems present them" (Dobson, 2003, p. 103).

Several scales have been developed to measure various aspects of ecological citizenship and its components including: Alisat and Riemer's (2015) environmental action scale that measures civic engagement, Keiser's (2008) general ecological scale that measures proenvironmental behavior, and Dunlap's (2000) new ecological paradigm scale that measures receptiveness to new forms of environmental citizenship. These scales share the acknowledgement that ecological citizenship involves personal values, beliefs, lifestyle, and behavior. As with the concept itself, interpretation of values, beliefs, lifestyle, and behavior can be politically motivated; however, proenvironmental behavior, as the basis for ecological citizenship, is defined as an intentional action (Dobson, 2003) that is "environmentally driven" (Alisat & Riemer, 2015, p. 15).

Predicting proenvironmental behavior is complicated by "ill-defined preferences" (Lee, Hochman, Prince, & Ariely, 2016, p. 2), "personal and social influences" (Carmi, Arnon, & Orion, 2015, p. 2), and complex networks of social identity (Gifford & Nilsson, 2014). Wilson (2009) argued that proenvironmental behavior was innate as individuals are born with a desire to connect to nature, but many studies have shown that this desire fades by late childhood (e.g., Soga & Gaston, 2016) and is highly influenced by regional and cultural constructs (Hanspach, Loos, Dorresteijn, Abson, & Fischer, 2016; Shapiro et

al., 2016; Soga et al., 2016). Dresner, Handelman, Braun, and Rollwagen-Bollens (2015) found that proenvironmental behavior is developed and promoted through an internal sense of connection to others. This connection to others can lead to a sense of guilt for not exhibiting the same behavior (Bissing-Olson, Fielding, & Iyer, 2016), and create a sense of place in the community (Hausmann, Slotow, Burns, and Di Minin, 2015).

Many studies have focused only on the personal and social constructs of proenvironmental behavior, which creates a fragmented understanding of both proenvironmental behavior and ecological citizenship (Islar & Busch, 2016). Dobson (2010) argued that proenvironmental behavior is a key component to ecological citizenship, whereas Wright (2015) and Jagers, Martinsson, and Matti (2014) posited that ecological citizenship is a driver of proenvironmental behavior. Understanding the circular and symbiotic relationship between ecological citizenship and proenvironmental behavior is complicated through the focus on internal motivation for demonstrating proenvironmental behavior, which largely ignores external influences on individual behavior.

External influences on individual behavior regarding the promotion of proenvironmental behavior and the development of ecological citizenship include public policy and NGO programs. Forrester et al. (2016) and Lewandowski and Oberhauser (2015) found that opportunities provided by NGOs increase proenvironmental behavior by providing the social opportunities needed to foster internal behavioral change. Increasing environmental education also increases proenvironmental behavior (Lummis, Morris, Lock, & Odgaard, 2016). Melo-Escrihuela (2015) expanded external influences

to include ideological changes in local governance by suggesting that ecological citizenship requires the development of the green state.

A green state is a form of democracy that involves the public in environmental decisions (Eckersley, 2004). Changes in public policy was also recommended by Soga and Gaston (2016) to break the "cycle of disaffection towards nature" (p. 94) that occurs between childhood and adulthood. Creating more social and public policy to elicit proenvironmental behavior may have contradictory results, because having too many environmental policies can lead individuals to believe "that the government has assumed responsibility for protecting the environment" (Turaga, Howarth, & Borsuk, 2000, p. 221), thereby restricting the development of ecological citizenship.

Internal and external influences on individual behavior are not self-contained spheres of influence, but rather act in a cyclic nature of influence where individuals influence social change that results in public policy changes, and changes in public policy create changes in social programs that then produce changes in individual behavior. For example, Seyfang (2016) studied how individual demand and willingness to pay influenced sustainable farming practices, which resulted in an increase in organic food supply, whereas Kansas offers financial incentives through the Habitat First and Backyard Wildlife Habitat Improvement programs to elicit proenvironmental behavior among state residents (Rohweder, 2015). Many researchers have focused on the internal to external flow of influence, but few have studied the external to internal flow of influence. Understanding how political systems influence the development of ecological

citizenship and proenvironmental behavior has been noted by Wright (2015), Islar (2016), and Scoville (2016) as essential to further understand sustainability.

Problem Statement

Despite decades of research on environmental behavior, it is unknown how various political actors aid in the development of ecological citizenship. Ecological citizens "will avail themselves of the opportunities for collective action with which political systems present them" (Dobson, 2003, p. 103). State agencies, NGOs, and state organization partnerships provide such opportunities for collective action through citizen scientist programs, public program development, environmental education, and environmental volunteer opportunities. Anderson (2016) reported that 74% of adults believe the environment should be protected, yet the Corporation for National and Community Service reported that only 25.3% of Americans volunteered in 2015. This gap between belief and action reflects the gap in knowledge of ecological citizenship development. Lummis et al. and Odgaard (2016), Wright (2015), Islar (2016), Scoville (2016), and Melo-Escrihuela (2015) examined the development of ecological citizenship from the individual and political perspective exclusively while concluding that more knowledge is needed to fully understand how external forces, such as political systems, influence the development of ecological citizenship.

In this quantitative study, I examined how state legislators and agents, state organization partners, and NGOs perceive their roles in the development of ecological citizenship within their states. Filling this gap in the literature is important because state legislators represent public environmental interest, state organization partners develop

state wildlife action plans, and NGOs develop environmental programs that provide social and policy-influencing opportunities to interact with nature and other environmentally friendly individuals. When these three entities present a unified external response to an environmental need, individual compliance is increased; however, when ecological citizenship is increased, the need for a unified external response is decreased because individuals are accepting a greater personal responsibility for the local and global environment (Dobson, 2003).

Purpose of the Study

My purpose in this quantitative study was to explore how state legislators and agents, state organization partnership directors, and NGO staff and administrators perceive their roles in the development of ecological citizenship within five states: Iowa, Kansas, Nebraska, South Dakota, and North Dakota. State legislators and agents, such as the Iowa Department of Natural Resources, create laws, rules, and programs that promote conservation behavior through a variety of mechanisms including environmental justice and financial incentives. Many state environmental laws, rules, and programs, such as the state's Wildlife Action Plan (SWAP), are created through partnerships with environmental organizations, such as Ducks Unlimited and the Sierra Club, that aid in increasing public knowledge and compliance. Environmental organizations that focus on direct community conservation development, such as the Iowa Association of Naturalists and Kansas Association of Conservation Districts, interact directly with the public to improve environmental knowledge and awareness, as well as provide social opportunities that encourage conservation behavior. These three entities, state legislators and agents,

state organization partners, and environmental NGOs, exist and operate within the most removed sphere of influence over individual development, the exosystem, but influence individual development through direct and indirect methods These three entities are also members of the local political system that influence the development of ecological citizenship and conservation behavior, but researchers have neglected to fully explore this source of influence and the development ecological citizenship (Lummis et al., 2016; Islar, 2016; Melo-Escrihuela, 2015; Scoville, 2016; Wright, 2015).

I selected Kansas, Nebraska, North Dakota, South Dakota, and Iowa for this study because their borders lie solely within the U.S. temperate grasslands. The temperate grasslands are one of most threatened biomes in the world because of human activity, and they are also the least protected global biome (International Union for Conservation of Nature, 2016). Species variation, or biodiversity, in the temperate grasslands is low, but species saturation, species population, is often high (National Park Service, 2016). The lack of biome protection affects biodiversity within the region.

Loss of biodiversity within a biome and loss of a biome in its entirety can negatively affect human growth and development through increased disease transmission (Dantas-Torres, 2015) and negatively affects an individual's mental health (Sandifer, Sutton-Grier, & Ward, 2015). Such loss may also negatively affect an individual's immune system (von Hertzen et al., 2015). Ecological citizenship studies often focus on a specific city (e.g., Cockett, 2009), specific educational facility (e.g., Wolf & Statham, 2008), and environmental behavior (e.g., Sengupta, Maji, & Sengupta, 2014); however, I

found no studies that focused on a specific biome to better understand how agents within that region can promote the development of ecological citizenship.

Understanding the development of ecological citizenship will improve biodiversity within the grasslands through improved NGO opportunities and political programs. To gain this understanding and fill the gap in knowledge, I surveyed state legislators and agents, state organization partnership directors and staff, and NGO leadership and staff to gain an understanding of the current level of proenvironmental behavior, support for ecological citizenship, and how the participants perceive their agencies' roles in developing ecological citizenship within their states.

Theoretical Framework

The theoretical framework for the current study was Bronfenbrenner and Ceci's (1994) bioecological model, which is an extension of Bronfenbrenner's (1977) social-ecological model. The social-ecological model consists of four nested systems that influence human behavior and development (Figure 1). The microsystem, family and peer groups, is the most influential system and closest to the individual (Bronfenbrenner, 1977). The next nested system, the mesosystem, is where different microsystems interact and influence the development of the individual's microsystem (Bronfenbrenner, 1977). Factors that influence the microsystem without directly influencing the individual, such as industry and media, are found in the exosystem and form the third nested system (Bronfenbrenner, 1977). The last nested system, the macrosystem, consists of cultural and political constructs (Bronfenbrenner, 1977).

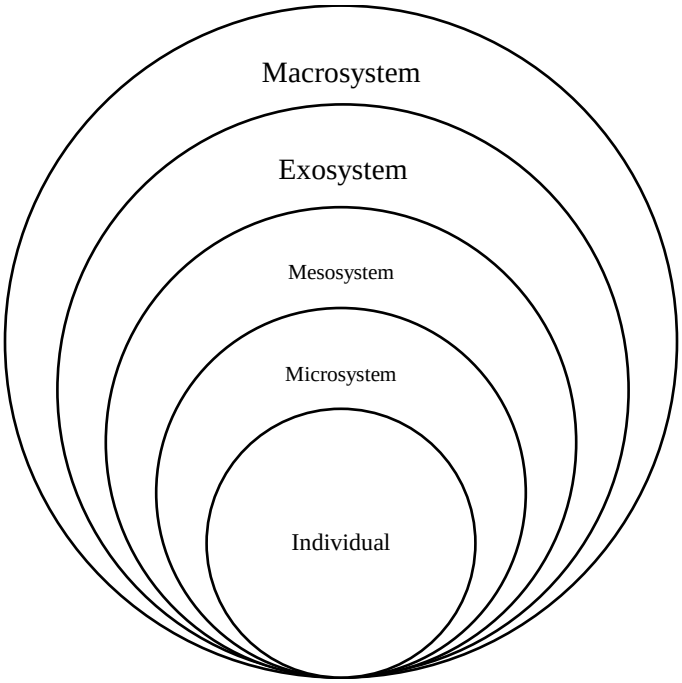

Figure 1. Bioecological model.

Researchers have debated which system presents the greatest influence over human behavior and development. Bronfenbrenner (1977) argued that the microsystem is the most influential subsystem, but Kollmuss and Agyeman (2002) and Martín-López and Montes (2015) found that the outer systems, exosystem and macrosystem, also have the ability to greatly influence individual behavior by modifying the microsystem through policy (Table 1). The initial model lacks the inclusion of genetic factors and the direct effect of time on individual development (Bronfenbrenner & Ceci, 1994).

Table 1

Influential Factors Within the Bioecological Model

Individual	Microsystem	Mesosytem	Exosystem	Macrosystem
Height	Parents/family	Microsystem/micro system interaction zone	Social services	Cultural norms and values
Weight	Teachers		School district	
Physical attributes	Peer group		Health services	
Personality	Close neighbors		Extended family	
Gender	Church		Mass media	
			Organizations/workplaces	
			Government	

The bioecological model retains the four nested systems but adds a fifth system, called the chronosystem, which accounts for the effect of time on human behavior (Bronfenbrenner, 1994). This new theory also includes a new framework called the process-person-context-time (PPCT) model (Bronfenbrenner & Ceci, 1994). Bronfenbrenner and Ceci (1994) introduced three new propositions in the new model: "Human development takes place through processes of progressively more complex reciprocal interaction . . . in its immediate environment" (p. 572), the power of these processes varies depending on environment, and the "processes serve as a mechanism for actualizing genetic potential for effective psychological development" (p. 572).

The PPCT model also presents two new hypotheses that expand applicability of the new bioecological model to a variety of studies. First, Bronfenbrenner and Ceci (1994) hypothesized the strength of the process, or experience, would be directly related to the outcome. Dresner et al. (2015) found that the more volunteers have in common, the more they enjoy the volunteer experience and are more likely to return for another

volunteer experience. Second, Bronfenbrenner and Ceci (1994) hypothesized that the strength of the process, or experience, would be directly related to the competency of the individual. These hypotheses support the addition of the chronosystem to the new model. Effective behavioral change requires a series of strong, positive experiences in time. Bronfenbrenner's original and revised bioecological model did not envision the technological advances of the past 20 years, but many studies (e.g., Edwards et al., 2017; Lester et al., 2016) have viewed technology, such as social media and online learning, as contained in the microsystem and maintaining direct influence over individual development; however, modern technology is also subject to external pressure through public policy.

In this study, I explored the roles of state legislators and agents, state organization partners, and NGOs in the development of ecological citizenship. I assumed that proenvironmental behavior is required for ecological citizenship, which creates a multilayered individual who is concerned about their local community as well as the global community and future generations (Dobson, 2003). The bioecological model fits the multilayered nature of the problem by assigning individual components addressed in the study in different nested systems.

Bronfenbrenner and Ceci (1994) noted that each influential system should exert the same strength over the individual. In my study, I build on previous studies on individual proenvironmental behavior that focused on the inner two systems, individual and microsystem, and my findings help fill a gap in understanding how ecological citizenship is developed by focusing on the outer two systems, exosystem and

macrosystem, and how agents in these systems perceive their roles in influencing the inner two systems.

The first proposition in the bioecological model proposes that development "takes place through processes of progressively more complex reciprocal interaction . . . on a fairly regular basis over extended periods of time" (Bronfenbrenner, 1995, p. 620). These processes include "parent-child and child-child activities, group or solitary play, reading, learning new skills, studying, athletic activities, and performing complex tasks" (Bronfenbrenner, 1995, p. 620) and vary in "form, power, content, and direction" (Bronfenbrenner, 1995, p. 621). Environmental NGOs create and operate youth programs that introduce young children to nature through parent-child play groups, youth day camps, and overnight experiences in local nature centers. As the participants age, the social opportunities expand to species-specific interaction, inclusion of other hobbies into the outdoors, and increased physical interaction with nature through hiking and other outdoor recreation (Riemer, Lynes, & Hickman, 2014). Adults may participate in citizen scientist programs that assist universities and other NGOs and agencies collect much needed scientific data on a specific species or on the general health of an ecosystem (Chandler et al., 2016). Nongovernmental organizations exist in the exosystem and can significantly influence the microsystem and individual through program offerings, but they also influence state agencies and lawmakers through lobbying and other policy-influencing efforts. Understanding how NGOs perceive their roles in ecological citizenship is the first step to understanding how NGOs can use their influence to aid in the development of ecological citizenship.

As Bronfenbrenner (1995) noted, proximal processes take place through a variety of forms. One proximal process that can influence the development of ecological citizenship is environmental education. Because the United States has compulsory education, the state has a 16-year relationship with almost all its residents. This relationship provides the opportunity for reading, studying, and learning new skills (De Leeuw, Valois, Ajzen, & Schmidt, 2015). Although studies have shown that education alone cannot sustain proenvironmental behavior or lead to the development of ecological citizenship (Fujitani, McFall, Randler, & Arlinghaus, 2016; Prévot, Clayton, & Mathevet, 2016), the macrosystem's influence can be multiplied through the exosystem and their hands-on relationships. State legislators also have direct influence on employers and family groups in the microsystem through rules and regulations that elicit or influence environmental behavior. Therefore, understanding how state legislators and agencies perceive their roles in developing ecological citizenship aids in understanding how the microsystem and exosystems are affected, and whether the power of influence is amplified through joint efforts or is reduced through conflicting perceptions. The bioecological model and its division of influence guided the development of research questions for this study.

Research Questions and Hypotheses

The overarching question in this study was: How can ecological citizenship be increased within a five-state region in the North American grasslands? To answer this question, a better understanding of ecological citizenship and how it is developed is required. Application of the bioecological model allows the complex relationship

between individual proenvironmental behavior and the development of ecological citizenship to be viewed as a series of proximal processes between internal and external systems of influence. Studies have focused on internal influences that lead to proenvironmental behavior, but few have focused on the external influence created by political systems. This gap in understanding ecological citizenship development led me to create the following research questions and hypotheses that formed the framework of this study:

RQ1: What roles do state legislators and agents perceive that state governments can play in fostering ecological citizenship among residents in their states?

H_o1: There is no significant relationship between state legislator and agents' worldview and willingness to take action.

H_a1: There is a significant relationship between state legislator and agents' worldview and willingness to take action.

RQ2: What roles do state organization partner directors and staff perceive that their partnerships can play in fostering ecological citizenship among residents in their states?

H_o2: There is no significant relationship between state organization partner director and staff's worldview and willingness to take action.

H_a2: There is a significant relationship between state organization partner director and staff's worldview and willingness to take action.

RQ3: What roles do NGO administrators and staff believe their organizations can play in fostering ecological citizenship among residents in their states?

H_o3: There is no significant relationship between NGO director and staff's worldview and willingness to take action.

H_a3: There is a significant relationship between NGO director and staff's worldview and willingness to take action.

I developed these research questions to directly explore the influence of indirect agents within the exosystem. These agents act as influencers but are also influenced through personal experiences as explained by bioecological model. An individual's worldview is created through personal experience, and the NEP scale helps "explain the root causes of environmental behavior" (Anderson, 2012, p. 261). Each group selected for this study have varying degrees of proximity to the community. State legislators and agents are the furthest removed from directly influencing individual behavior. State organization partners can be close to their communities, but in the context of this study, serve to assist state legislators and agents in developing and implementing environmental policy. Environmental NGOs are the closest to the community and can directly influence individual behavior through community-based programs. The perceived roles of the private sector in the development and fostering of ecological citizenship is outside the scope of the current study but has been the focus of other studies (e.g., Lasrado & Arora, 2017; Sherval et al., 2018).

I used my hypotheses and study design to predict ecological citizenship within external agents of influence by first measuring the individual's worldview. The NEP can determine whether an individual has a low, medium, or high endorsement of environmental behavior. The willingness to take action scale then determines how much

the individual is willing to convince other community members to behave environmentally. Like the NEP, the willingness to take action scale can be measured in low, medium, or high levels. Therefore, nine possible combinations exist for an individual's worldview and their willingness to take action. In this study, in which I tested by the hypotheses, I expected that the participant's willingness to take action was dependent on the individual's worldview.

Nature of the Study

The nature of this quantitative study was to explore the roles of state legislators and agents, state organization partnership directors and staff, and NGO administrators and staff in the development of ecological citizenship within the U.S. grasslands. This study was framed by Bronfenbrenner and Ceci's bioecological model, and I used (2000) new ecological paradigm (NEP) scale and Sinatra et al.'s (2012) willingness to take action questionnaire to determine whether each influencing agent exerts the same strength over individual behavior. The development of ecological citizenship requires not only individual motivation and social acceptance, but also a certain level of receptiveness among policy makers and program developers to create a sense of financial need and social demand (Bronfenbrenner & Ceci, 1994; Rohweder, 2015).

I focused on legislators, agencies, NGOs, and state partners in Kansas, Nebraska, Iowa, North Dakota, and South Dakota. This region has 608 state legislators. Each state's wildlife action plan identifies formal partnerships between state agencies and organizational partners responsible for creating the SWAP. There are 67 partnerships in Kansas (Rohweder, 2015), 25 partnerships in Nebraska (Schneider, Stoner, Steinauer,

Panella, & Humpert, 2011), 31 partnerships in Iowa (Zohrer, 2006), 50 partnerships in North Dakota (Dyke, Johnson, & Isakson, 2015), and 55 partnerships in South Dakota (South Dakota Department of Game, Fish, and Parks, 2014). More than 50 additional environmental NGOs exist, such as Prairie Rivers of Iowa and Northern Prairie Land Trusts, which operate in this region. I selected these groups because they represent the political system within the grasslands that provide social opportunities for environmental action. In Chapter 3, I provide an in-depth description of the study's population and sampling strategy.

The development of ecological citizenship can be studied using a qualitative or quantitative approach. Qualitative approaches are best applied when "we want to empower individuals to share their stories, hear their voices, and minimize the power relationships that often exist between a researcher and the participants in a study" (Creswell, 2013, p. 48), and quantitative approached are best applied when using "instrument based questions, attitude data, and statistical analysis" (Creswell, 2009, p. 15). Many researchers studying ecological citizenship and environmental behavior have used a qualitative approach to better understand individual reasoning for engaging in environmental behavior (e.g., Lester & Cottle, 2009); however, my focus was not to understand individual reasoning, but to understand the group perception of role that the political system within the five-state region plays development and fostering of ecological citizenship, and to determine whether ecological citizens exist within the political system of the region. In this light, I followed the quantitative approach used by Martinsson and Lundqvist (2010) and Jagers et al. (2011).

Using a quantitative Likert-scaled survey (Appendix A) allowed for correlation testing between the respondent's environmental worldview and their willingness to take action to determine whether a relationship exists between the two variables, and if a relationship exists, the type of relationship. The quantitative approach also allowed for regression testing which determined if the respondent's environmental worldview predicted their willingness to take action. The relationship between a respondent's environmental worldview and their willingness to take action can provide a greater understanding of how they perceive their roles in the development and fostering of ecological citizenship within their states. The results of the current study will determine if the respondent's political party affiliation, political values, and group affiliation also influences their willingness to take action, that can later be used in qualitative studies to better understand how these characteristics promote or foster ecological citizenship development in individuals within these groups regardless of the group's location.

In the current quantitative study, I utilized a Likert-scaled survey to measure respondent's perception of the role their group plays in the support of proenvironmental behaviors and the development of ecological citizenship. The endorsement of ecological citizenship was tested using Dunlap's (2000) NEP scale that measures attitudes toward the environment, and Sinatra et al.'s (2012) willingness to take action questionnaire directly tested the perceived role of the respondent in the development of ecological citizenship within their community. Additional survey questions measured individual factors of ecological citizenship, and three yes/no questions allowed for open-responses to provide clarification or expansion of the respondent's answer. By using the same

survey with each of the three groups, I focused on the political system that has the power to change individual behavior. High perceptions within the legislative group have the power to influence lawmaking within the region that greatly impacts state agencies, partnerships, and other environmental organizations. High perceptions within the NGO and partnership groups have the power to greatly influence individual behavior through more focused environmental opportunities. In Chapter 3, I will discuss the methodology more in depth.

Definitions

Bioecological model: A model for human development where individual behavior can be influenced by family and friends, education and political systems, genetics, and time (Bronfenbrenner & Ceci, 1994).

Biophilia: The innate desire to connect with nature (Wilson, 1984).

Ecological citizenship: The expansion of proenvironmental behavior into the public sphere where individuals have a moral obligation to reduce their individual ecological footprint through non-reciprocal, non-contractual behavior (Dobson, 2003).

Proenvironmental behavior: "Behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world" (Kollmuss & Agyeman, 2002, p. 240). Examples of proenvironmental behavior include using public transportation to reduce air pollution and using reusable bags to reduce landfill waste (Bissing-Olsen, Fielding, & Iyer, 2016).

Proximal process: Interactions between individuals and their environment, and interactions between individuals and other people (Bronfenbrenner & Ceci, 1994;

Bronfenbrenner & Morris, 2006). These interactions form the foundation of the PPCT framework of the bioecological model.

State organization partnerships: Formal partnership organizations as identified in the state's wildlife action plan (SWAP).

Assumptions

I have seven assumptions because of the complex stratification of human development as described in the bioecological model. The first set of assumptions arise from the theoretical framework for the study. The first assumption is that biophilia, as described by Wilson, is an innate starting point for the development of environmental care and concern. The second guiding assumption is that development of an ecological citizen can be achieved through a series of increasingly complex interactions as described in Bronfenbrenner's bioecological model which provides points of opportunity to develop and hone individual biophilia. A third assumption of this study created by the theoretical framework is that influence flows both from the individual to public policy, and from public policy to the individual. This assumption allowed for the focus to be on the point of influence that is common to both directions of influence, the political agent. The next series of assumptions are related to the study's research questions, instruments, and research design.

To be effective, research questions must establish a clear "direction and path" for the research, aid in determining the "research design and methodology", and "define the theoretical and practical contribution" of the study (Alvesson & Sandberg, 2013, p. 11).

The fourth assumption of this study is that the research questions developed meet the criteria for effective research questions and will aid in meeting my purpose in this study.

The fifth assumption is that the selected instruments are reliable and support the research questions. For this study, there are two instruments that will be combined with basic demographic questions to form one cohesive survey that will measure the level of ecological citizenship endorsement and perceived role of the respondent in developing ecological citizenship within their states. The first instrument, Dunlap's (2000) New Ecological Paradigm survey is widely used in environmental behavior studies and has an initial reliability of $\alpha = .83$, which is quite high and supports the assumption that this instrument is a reliable measure of the respondent's worldview. The second instrument, Sinatra et al.'s (2012) willingness to take action scale often augments other instruments, such as Stern's value-belief-norm scale or the Dunlap's NEP, and has an initial reliability of $\alpha = .87$, which is also quite high and supports the assumption that this questionnaire provides a reliable measurement of the respondent's willingness to take action to minimize environmental impacts.

The last set of assumptions are related to the study's design and use of a quantitative survey. The sixth assumption is that the sample is representative of the population. According to the National Convention on State Legislatures (2017), the collective state senate is 40.2% Democrat, 57% Republican, and 2.8% Other, and the collective state house of representatives is 43% Democrat, 56.4% Republican, and 0.6% Other. It is important to note that Nebraska is the only state with a unicameral legislative branch and is included in the Other category under the collective senate. The five states

included in this study have a combined senate of 20% Democrat, 57.4% Republican, and 22.6% Other, and a combined house of 26.7% Democrat and 73.3% Republican. While it appears that this assumption is violated, the regional nature of partisan distribution supports the assumption that the respondents are representative of the population. The seventh, and last, assumption of this study is that respondents will be honest in their responses.

Scope and Delimitations

In this quantitative study, I focused on the role of selected political agents in the development of ecological citizenship within North Dakota, South Dakota, Nebraska, Kansas, and Iowa. These five states were selected because their boundaries are entirely within the U.S. grasslands. This biome is under constant threat due to increases in agriculture, changes in individual behavior, and community growth (Peart, 2008). This scope allows for the three types of grasslands to be included in one study. This study was also subject to a variety of delimitations, or researcher defined limitations.

The first set of delimitations of this study relate to the theoretical framework, overarching research question, and scope. Studies on environmental behavior, of which ecological citizenship is a unique form, have used a multitude of theoretical frameworks that focus on individual behavior and note involvement in social opportunities as a leading driver of proenvironmental behavior; however, few studies have expanded their inquiry into the external organizations that provide those social opportunities. The bioecological model allows for the focus to be on a single sphere of influence and forms the first delimitation of this study. For this study, I was only concerned with agents and

organizations that exist within the outer systems of influence, the exosystem and macrosystem; however, not all agents and organizations in these systems were selected for inclusion in the study. Only individuals and organizations who have the power to influence individual ecological development through indirect methods were selected as the target population for this study. By focusing on this group, I explored the power of influence within the mesosystem where policy and programs combine to influence those around the individual, rather than the individual directly. This group of influential agents on individual behavior has not been studied before in relation to ecological citizenship development.

In an ideal study environment, all state legislators and agents, NGO directors and staff, and state organization partners would be included in a cross-sectional study; however, time and financial limitations required the delimitation to one environmental biome, the U.S. grasslands. The temperate grasslands of North America are one of the least protected biomes yet is under constant threat by human activity (Peart, 2008). Less than 5% of global grasslands are protected, which makes understanding how to influence human activity within the region vital to its future survival (Peart, 2008). The five states selected for this study rest within the borders of the grasslands, has at least one grasslands protection area, and has a state wildlife action plan that promotes state organization and public cooperation to address environmental needs.

The second set of delimitations relate to methodology and research design. Studies on environmental behavior have often utilized qualitative designs that allow for understanding individual decisions and behavior; however, this focus on individual

motives largely ignores external influences that may assist in predicting individual behavior. Using the PPCT framework of the bioecological model, I explored only the external influences and the perceived role of those influences on individual behavior. Quantitative methods allow for predictive results to be developed that will aid in understanding how external agents influence individual ecological citizenship development within their states, rather than exploring how the presence of ecological citizenship, or lack thereof, influences political agents themselves. The research design and instruments helped focus the study on the external, non-direct influence of political agents on individual environmental behavior.

The research design, including instruments and variables, are also highly focused on only the perceived role of political agents in the development of ecological citizenship within their states. The dependent variable, willingness to take action, clearly identifies the respondent's level of ecological citizenship, while the three independent variables, political affiliation, exosystem group, and worldview, are limited to those variables that are directly related to the fundamental principles of ecological citizenship. Variables that are not included in this study include environmental education, participation in environmental activities, personal preferences, and personal values. These variables have been well studied in other studies, and can influence individual growth and development, but this study focuses on external influences rather than individual behavior. The instrument selected for this study utilizes a Likert-scale which does not allow for explanatory information to be provided by the respondent, which limits the type of information obtained; however, it allows for statistical identification of relationships that

may not have been identified using an open-ended qualitative questionnaire. Using a quantitative design will also allow the study to be replicated using a different population or location and form a comparative study to determine if results are applicable in a variety of environments that will further assist in policy and program development.

Limitations

This study has several limitations that are created by the study's methodology. One goal of quantitative research is to be generalizable to the whole population achieved through an adequate sample size. This study utilizes an electronic survey that may not have a high rate of participation, but this limitation is addressed through the inclusion of snowball sampling where the initial respondent is asked to share the survey with staff members, thereby increasing the potential participation rate. Another limitation created by the study's instrument is missing data. A respondent may choose not to answer a question, which could statistically impact the data analysis and interpretation of the results. This limitation is minimized using a combined survey that measures each variable with a different set of questions. No response on any question can be interpreted as a data value for that variable.

One of the greatest limitations in this study is the ability to determine the truthfulness of the responses. The survey investigates the respondent's willingness to take action and individual worldview, which may create a desire to appear more willing to encourage others or more accepting of an environmental worldview than they actually are. This is a limitation and risk of any survey involving individual behavior and beliefs. This limitation is addressed through the assumption that the respondent is being truthful

when they respond and will also be addressed in the survey introduction and consent form.

Access to the target population also forms a limitation for this study. While many organizational directors and staff are willing to participate in research, some may not be as accessible which may limit the sample size even further in one or more groups. Each potential organizational participant will be contacted to introduce the research topic and inquire about possible participation in the study.

Significance of the Study

Dobson presented ecological citizenship as a "normative idea" (MacGregor, 2014, p. 119), which created an opportunity for researchers to apply different theoretical frameworks, different research questions, and apply different methodologies while searching for a greater understanding of ecological citizenship and how it may provide a solution to global environmental problems. The development of an ecological citizen benefits not only the individual through improved social connections (Dresner et al., 2015) and other effects of biophilia (Wilson, 2009), but it benefits the community and the world through increased awareness of the connection between individual action and its impact on the future. Dobson (2003) also argued that consumer nations, such as the United States, have an ethical duty to promote conservation that will benefit all other nations.

One common theme in all ecological citizenship research is the need for further study. Two common factors in ecological citizenship research, either directly or indirectly, is public policy and program development. Seyfang (2007) noted that

ecological citizenship, if left to the public, will not be actively developed, but rather ecological citizenship development, and sustainable community development, requires an active government pursuing the requisite changes in social constructs that promote ecological individual behavior and the acceptance of grassroots environmental movements in policy development. Governmental supported changes in social norms and values have also been noted as drivers of ecological citizenship development by Chan et al. (2016), Dobson (2009), and Dresner et al. (2015). Quantitative studies directly on ecological citizenship are rare but have served to solidify the belief that ecological citizens, as envisioned by Dobson, do exist and are subject to multiple streams of influence including public policy and programs (Asilsoy & Oktay, 2016; Jagers, 2009; Jagers & Matti, 2009; Martinsson & Lundquist, 2010). The lack of focus on the role of public policy and program development creates a large gap in ecological citizenship development knowledge.

This study will begin to fill that large gap by focusing solely on state legislators and agents, state organization partnership directors and staff, and NGO directors and staff. These three groups create a network of decision makers that have the power to influence individual behavior and promote social change. Focusing on their perceived role in the development of ecological citizenship, this study opens the door for new studies into leadership style and ecological citizenship, comparative studies between types of agencies and level of ecological citizenship, case studies on specific programs designed to promote the decrease of individual ecological footprints, and policy evaluations in terms of social change toward green theory principles.

Implications for Social Change

This study contributes to the body of knowledge on ecological citizenship, NEP application, and the bioecological model. It also contributes to social change within the U.S. grasslands. There are three separate groups included in this study, which creates three unique possible contributions to social change.

State legislators and agents create social change through public policy. This study explores the relationship between this group's worldview and their willingness to take action, which promotes the development of ecological citizenship. Understanding the current level of ecological citizenship within the grasslands legislative branch will aid in the development of the state wildlife action plan. Ecological citizens want to protect the environment for future generations and state legislators and their agents are key contributors to ensuring the clean environment for their community. Improving the state wildlife action plans can contribute to positive social change through improving biodiversity within the region. Increased biodiversity can improve public health through decreased allergies (Ruokolainen, Fyhrquist, & Haahtela, 2016), increase social connections (Dresner et al., 2015), and even influence career choices (di Fabio & Bucci, 2016).

State organization partners, such as the Iowa Wildlife Center and Pheasants Forever, create social change through lobbying efforts and direct intervention within the community through animal rehabilitation, conservation projects, and assisting in the development of the state wildlife action plan. The results of this study will aid in this group's mission by providing more information on the current level of ecological

citizenship within the community and the legislative branch of their respective states. With this knowledge, organization directors can create informational opportunities that may increase ecological citizenship within the legislative branch by changing either the legislator's worldview or increasing their willingness to take action to save the local environment.

The greatest amount of social change because of this study can occur within the NGO group. Environmental NGOs, such as the Audubon Society and Ducks Unlimited, currently provide citizen scientist programs and other social opportunities for residents to engage in environmental behavior; however, participation in many programs is low. Understanding how an individual's worldview can predict ecological citizenship will allow NGOs to create programs aimed directly at changing the communal worldview through increased environmental education and social opportunities to foster biophilia within the community. While the current study separated NGOs that form formal partnerships with a state in the development of that state's wildlife action plan, the entire NGO sector presents a fantastic opportunity for social change through informal partnerships between residents and the state government that bridge the SWAP's goals and communal demands.

Positive social change is not limited to the U.S. grasslands. The results of this study contribute to the body of knowledge on ecological citizenship, proenvironmental behavior, NEP application, and bioecological model application. This increase in knowledge and understanding can be extended to different biomes within the United States and other countries. Developing a greater understanding of ecological citizenship

within the United States aids national policy makers develop policy that maximizes individual environmental contributions rather than placing the weight of future generation environmental health and well-being on the states.

Summary

The temperate grasslands are one of the most threatened biomes in the world due to human activity and is the least protected biome (International Union for Conservation of Nature, 2016). The temperate grasslands in the United States, also referred to as the prairie, is under constant threat as human activity outweighs state and national protection. Lack of federal protection affects biodiversity in the region and states have turned to state wildlife action plans and partnerships with environmental NGOs to protect the grasslands. These plans and partnerships highlight the need for public participation in all stages of biome protection. This call for participation demonstrates the need for ecological citizens within the region. Ecological citizens act in the best interest of the local environment, while focusing on global environmental well-being (Dobson, 2003). Ecological citizenship development relies on proenvironmental behavior, environmental care and concern, and is both non-territorial and non-reciprocal (Dobson, 2003). The literature on proenvironmental behavior is vast and employs a variety of theoretical and conceptual frameworks. However, much of the literature on ecological citizenship is normative and few studies have explored it empirically with even less studies exploring its development through the bioecological lens. The bioecological model developed by Bronfenbrenner and Ceci (1994) is ideal for exploring the relationship between individual belief and promoting ecological citizenship in others. The model's multi-tiered system of

influence flows both outward from the individual to public policy and culture, and inward from culture and public policy to the individual. This study fills the gap in empirical literature on ecological citizenship development by exploring the inward flow of influence with a focus on political agents and groups within the exosystem. This group has the power to influence individual behavior through their willingness to take action and is influenced by their own personal worldview.

Chapter 2 reiterates the gap found in the literature as well as presents the search strategy employed to explore the literature. The focus of the chapter, however, is a review of the literature beginning with an introduction and thorough investigation of the bioecological model that frames this study. The next section in the literature review presents the rise of environmentalism and its cyclic nature as it flows from individual concerns to a national agenda. In the 1970s, international and national environmentalists began looking for innovative solutions rather than relying on public policy. One solution arose from deep ecology and shifts focus from individual rights to individual responsibilities. This solution, ecological citizenship, is then explored in the remainder of the literature review and how its development may be guided and predicted by the bioecological model. Chapter 2 concludes with a summary of variables and methodologies found in the literature and how the literature shaped this study.

Chapter 3 presents the methodology for this study. A study's methodology provides a roadmap for the study and includes operationalization of the variables, defines the population, explains the sampling methods used in the study, and discusses the

instruments used to measure the variables. Chapter 3 concludes with a discussion of threats to the study, ethical considerations of the study, and the plan for data storage.

Chapter 4 presents the study's results and findings, and Chapter 5 discusses the findings as well as presents suggestions for further study that will close the gap in understanding how ecological citizenship can be developed through the public sector.

Chapter 2: Literature Review

Introduction

My purpose in this quantitative study was to explore the perceived role of state legislators and agents, state organization partners, and NGOs in the development of ecological citizenship within five states: Iowa, Kansas, Nebraska, South Dakota, and North Dakota. Less than 1% of the U.S. grasslands are protected despite the biome shrinking to only 5% of its natural state because of increased agriculture and human activity (National Park Service, 2016; Pieper, 2005; WWF, 2016). The connection between environmental health and individual health is well documented (Dantas-Torres, 2015; Sandifer et al., 2015; von Hertzen et al., 2015), which makes protecting the region's environmental health vital to the health and wellbeing of more than 9 million regional residents.

Regional environmental protection is currently achieved through national environmental policies (e.g., Clean Air Act of 1963, 2016; Endangered Species Act of 1973, 2016; National Environmental Policy Act of 1969, 2016), national parks and reserves (Ashton, Symstad, Davis, & Swanson, 2016; Freese, 2015), state-created environmental programs (Rohweder, 2015; Zohrer, 2006), and citizen scientist opportunities provided by state organization partners and other NGOs (Kobori et al., 2016; Schwartz, Beaubien, Crimmins, & Weltzin, 2013; Soranno, Cheruvelil, Elliot, & Montgomery, 2015). Individual behaviors, such as decreasing ecological footprint (Galli, Wackernagel, Iha, & Lazarus, 2014; United Nations Conference on Environment and Development, 1993), participating in environmental political processes (Carter, 1993;

Glucker, Driessen, Kolhoff, & Runhaar, 2013), and volunteering for environmental organizations (Johnson et al., 2014; Silvertown, Buesching, Jacobsen, & Rebelo, 2013), also aid in regional environmental protection and rehabilitation.

Despite a high rate of concern for the environment, less than 25% of Americans reported demonstrating proenvironmental behavior daily (Funk & Kennedy, 2016). Cultivating proenvironmental behavior and increasing public participation in environmental processes has been extensively studied during the past 30 years in a variety of fields (e.g., Bissing-Olson et al., 2016; Cooper, Larson, Dayer, Stedman, & Decker, 2015; Miao & Wei, 2013), yet few have applied the bioecological framework to proenvironmental behavior (e.g., Blanchet-Cohen & Reilly, 2016). Using the bioecological framework supports the creation of a new type of citizen, the ecological citizen.

Ecological citizens think and act locally and globally, demonstrate proenvironmental behavior, participate in environmental political processes, and believe that today's actions influence future generations (Bell, 2005; Dobson, 2003; Melo-Escrihuela, 2008; Schild, 2016). Proenvironmental behavior, and how it is developed, has been well studied during the last 30 years, but ecological citizenship remains an elusive ideal of sustainable living and few have empirically studied its development. To add to the current knowledge base on ecological citizenship, and expand what is known about its development, I explored the perceived roles of state government, agencies, and NGOs operating in five states located within the U.S. grasslands in the development of ecological citizenship by focusing on individual worldview and willingness to take

action. These two variables are developed through proximal processes described in the bioecological model (Bronfenbrenner & Ceci, 1994) from both an inward, culture-to-individual, and outward, individual-to-culture, influence. In the following section, I present the search strategy that I used to shape this literature review, identify gaps in understanding, identify possible theoretical and conceptual frameworks, and assist in the operationalization of ecological citizenship for this study.

Literature Search Strategy

Booth, Sutton, and Papaioannou (2016) suggested that a systematic literature review consists of five phases that allow the researcher to uncover all applicable literature. These five stages are the scoping search, conduct search, bibliography search, verification, and documentation (Booth et al., 2016). During the scoping search using Google Scholar and the local library, I discovered the following key search terms: *proenvironmental behavior*, *environmental citizenship*, *ecological citizenship*, and *biophilia*. I searched databases available through the Walden Library using the key search term *proenvironmental behavior* to determine which databases were best suited to the study. The Political Science Complete database yielded the fewest results, SAGE Premier yielded 223 results, Academic Search Complete yielded 128 results, PsycINFO yielded 183 results, and the Thoreau Multi-Database search yielded 1,436 results. The other key search terms produced even fewer results using these databases; however, when I used Google Scholar, the search results increased to more than 9,000 results. Because of the scoping and conduct search phases, Google Scholar and the Thoreau Multi-Database served as the primary search tools for online literature. A local public library

served as the primary source for government documents and books relating to the study.

After locating key articles, I conducted bibliography searches to identify relevant articles and key authors. The results of this phase expanded the study's search strategy to include the following key authors: Cox, Dobson, Gaston, and Soga. After a brief search using the new key authors, key search terms expanded to include *socio-ecological model*, *bioecological model*, *PPCT model*, *green theory*, *sustainable consumption*, *ecologism*, *post-cosmopolitan citizenship*, and *green politics*. Search results were not limited to a specific time frame because of the cyclic nature of the environment as a political agenda, which allowed for a comprehensive literature search. I verified all journal results through Ulrich's for peer-review or refereed status. I also used British English spellings to ensure I found all available literature. In the following section, I present a thorough exploration of Bronfenbrenner and Ceci's bioecological theory, the primary framework for this study, and how it creates a formal framework for exploring the development of ecological citizenship.

Theoretical Foundation

Studies on environmental behavior often use Aijzen's (1991) theory of planned behavior (e.g., de Leeuw et al., 2015; Greaves, Zibarras, & Stride, 2013), Vroom's (1964) expectancy theory (e.g., Purvis, Zagenczyk, & McCray, 2015), or Stern's (1999) value-belief-norm theory as a framework (e.g., Kiatkawsin & Han, 2017; Nguyen, Lobo, & Greenland, 2016; Yeboah & Kaplowitz, 2016). Each of these theories focus on individual motivators for a desired behavior and provide an excellent framework for exploring individual proenvironmental behavior; however, these theories do not directly

account for external forces that contribute to individual behavior. As Nguyen et al. (2016) noted, their results could be used "to target consumers who have strong biospheric values to accelerate the uptake of energy efficient appliances" and "that potential purchasers could be motivated by a compelling message . . ." (p. 106), which implies that external forces also contribute to the cultivation of environmental behavior.

In 1979, Bronfenbrenner developed a unique framework, ecological systems theory, which not only accounted for external motivators, but suggested that human development is the result of internal and external factors interaction. Ecological systems theory is founded on a nested doll concept in which the child's development is influenced by a series of direct and indirect interactions that take place in a variety of settings (Bronfenbrenner, 1979). The level of influence held by each nested doll is determined by its proximity to the child and how the child transitions between each doll (Bronfenbrenner, 1979). In the course of nearly 20 years, Bronfenbrenner fine-tuned the ecological systems theory as hundreds of researchers validated the theory and highlighted new possibilities (e.g., Andrews, Bubolz, & Paolucci, 1981; Howe & Briggs, 1982; Young, 1983). Although this theory has been well used in psychology and child development research, its application to ecological citizenship research has been limited; however, both the original model and the new bioecological model have been used often in environmental behavior studies (e.g., Litt et al., 2015; Riemer et al., 2014).

Bioecological Model

In 1994, Bronfenbrenner and Ceci presented their revised theory of human development, the bioecological model, which expanded on ecological systems theory and

the socioecological model to formally integrate the chronosystem, or time system, and formalize the multidirectional nature of influence on human behavior. The new bioecological model has been used to explore a variety of developmental transitions including transition from pediatric to adult care from the sibling's perspective (Porter, Graff, Lopez, & Hankins, 2014), exploration of the father-child relationship when the father is incarcerated (Dennison, Smallbone, & Occhipinti, 2017), and a longitudinal study of the transition from childhood to adolescence (Garbarino, Burston, Raber, Russell, & Crouter, 1978). It also redefined human development as "the phenomenon of continuity and change in the biopsychological characteristics of human beings, both as individuals and as groups" (Bronfenbrenner & Morris, 2006, p. 793).

Changes in biopsychological characteristics require increasingly complex reciprocal interactions for long periods called *proximal processes* that vary in "form, power, content, and direction" and "serve as a mechanism for actualizing genetical potential for effective psychological development" (Bronfenbrenner & Ceci, 1994. p. 572). The PPCT framework guides understanding how different agents interact on a variety of levels that influence human development. The following is an exploration of the PPCT framework components; then, with this framing in place, I focus on how this framework can aid in understanding the development of an ecological citizen.

PPCT Framework

Process. Proximal processes are interactions between individuals and their environments, and interactions between individuals and other people (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). These interactions serve as "the primary

engines of effective development" (Bronfenbrenner & Ceci, 1994, p. 572); however, they are subject to the limitations imposed by the context of the interaction (Figure 2).

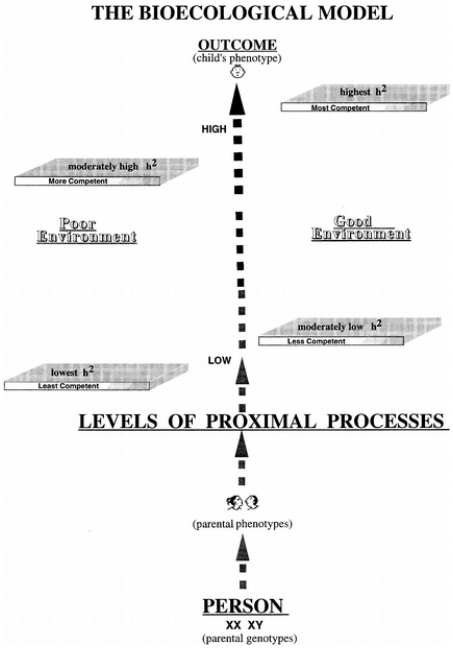

Figure 2. Proximal process. This figure shows how individual development is dependent on level of proximal process but is also constrained by "genetic potentials" (Bronfenbrenner & Ceci, 1994, p. 581)

Person. Proximal processes begin with the individual. The individual, or *person*, possesses "genetic potentials" that are "actualized" through proximal processes (Bronfenbrenner & Ceci, 1994, p. 570). An individual's disposition, resources, and demand determine the strength and power of the proximal process (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). Kellert and Wilson (1995) proposed that humans are born with an innate desire to connect with nature. This connection is based in genetics and actualized through individual behavior (Kellert & Wilson, 1995; Wilson, 1984). Individuals who actively encourage and develop this connection have stronger relationships with their environments and will seek out continued interaction

(Bronfenbrenner & Morris, 2006). An individual's disposition begins with simple exploration and, as they age, becomes more complex given their genetic constraints and access to resources (Bronfenbrenner & Ceci, 1994).

Resources available to individuals can significantly influence their development (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). Resources are genetic and physical attributes, such as intelligence and physical handicaps, and "developmental assets", such as "knowledge, skills, and experience" (Bronfenbrenner & Morris, 2006, p. 812). Resources are used by individuals during proximal processes within a context and are shaped by, and help shape, the proximal process (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006; Kellert & Wilson, 1995). Studies have found that high quality contexts are still limited by individual resources and demand (Bronfenbrenner & Ceci, 1994; Nobre, Coutinho, & Valentini, 2014; Prendergast, 2016; Strachan, Fraser-Thomas, & Nelson-Ferguson, 2016).

An individual's demand is the third characteristic of the person and refers to "their capacity to invite or discourage reactions from the social environment" (Bronfenbrenner & Morris, 2006, p. 812). Bronfenbrenner and Morris (2006) described possible demand characteristics as "fussy versus happy" or "attractive versus unattractive" (p. 812); while Strachan, Fraser-Thomas, and Nelson-Ferguson (2016) described demands in terms of dedication and financial support. Demands, like resources, are both internal and external manifestations of proximal processes and inherent attributes that can be altered through different contexts.

Context. In the bioecological model, proximal processes take place in four contexts, or systems: microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). Each system influences proximal processes within that system and has the power to influence proximal processes in the other systems.

Microsystem. The microsystem is the most directly influential system and consists of direct interactions with others (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). Researchers have found that positive environmental social interaction greatly increases the frequency and intensity of environmental behavior, improves environmental identity, and promotes further environmental interaction (Dresner et al., 2014; Prati, Albanesi, & Pietrantoni, 2015; Sorenson & Jordan, 2016; Stapleton, 2015). Bronfenbrenner and Morris (2006) suggested that an individual's characteristics are shaped by the microsystem's "parents, relatives, close friends, teachers, mentors, coworkers, spouses, or others who participate in the life of the developing person on a fairly regular basis over extended periods of time" (p. 796). Generational beliefs are passed through the microsystem but can also be shaped by proximal processes found in the mesosystem.

Mesosystem. In the original ecological systems theory, Bronfenbrenner (1979) described contexts as being nested dolls that influence individual development through each other. The mesosystem, the second nested doll from the individual, is where different microsystems interact (Bronfenbrenner, 1979). For example, a child's teacher and parents exist within the child's microsystem, but when the teacher and parents have a

meeting to discuss the child, that proximal process occurs in the child's mesosystem (Bronfenbrenner and Ceci,1994). Proximal processes that take place in the mesosystem affect the individual indirectly without having control over the process. Proximal processes become further removed from direct interaction with the individual in the exosystem and macrosystem.

Exosystem. The third nested doll from the individual creates proximal processes that affect the individual indirectly and can occur with or without individual participation. Proximal processes within the exosystem include public policy, social programs, media, and institutions (Bronfenbrenner, 1977). The role of the exosystem in individual development has been studied in various settings including emergency preparedness and trauma management (Boon et al., 2012; Hoffman & Kruczek, 2011; Noffsinger et al., 2012), educational attainment and success (Erdener, 2016; Lange & Garrett, 2014; Renn & Arnold, 2003), and civic participation (Duke, Skay, Pettingell, & Borowsky, 2009; Geldhof, Bowers, & Lerner, 2013; Hasford, Loomis, Nelson, & Prancer, 2016). The exosystem is the last formalized context that has clear agents within its influential reach (Bronfenbrenner, 1977).

Macrosystem. The outermost nested doll that helps frame all other contexts is the least formalized system of influence and consists of cultural norms and values, "institutional patterns" and "carriers of information" (Bronfenbrenner, 1977, p. 515). The exosystem, mesosystem, and microsystem are the "concrete manifestations" of the macrosystem (Bronfenbrenner, 1977, p. 515). Researchers have found that cultural

constructs heavily influence individual belief systems and behavior by shaping and reshaping cultural norms and values over time (de Pinho et al., 2014; Soga et al., 2016).

Time. The original ecological systems theory placed time as the fifth nested doll, but as Bronfenbrenner adapted the theory, time became the fourth component of the PPCT framework (Bronfenbrenner, 1977; Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). As noted earlier, human development occurs over time through increasingly complex reciprocal proximal processes. In the refined bioecological model, Bronfenbrenner and Morris (2006) describe time in terms of its relation to its associated system. Proximal processes begin in the microsystem and occur in continuous "microtime" (Bronfenbrenner & Morris, 2006, p. 796). Recurring microtime proximal processes over weeks and months take place in "mesotime" (Bronfenbrenner & Morris, 2006, p. 796). Changes to the community's culture takes extended periods of "macrotime" and account for the generational continuance of behavior (Bronfenbrenner & Morris, 2006, p. 796).

Bioecological Model and Ecological Citizens

The ecological citizen accepts personal responsibility for the health of the ecosystem and its role within the global environment through demonstrating proenvironmental behavior and participating in the political system to ensure a healthy environment for future generations (Dobson, 2003). At its core, ecological citizenship and individual ecological citizens are concerned about future generations and will take collective action when opportunities are available (Dobson, 2003). Under this basic

premise of ecological citizenship, its multi-layered characteristic can be identified and examined using the PPCT framework as a guide.

Ecological citizens, like all individuals, possess an innate desire to connect to nature (Wilson, 1984). This *person* component is shaped and fostered by the individual's immediate environment (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006), but studies have shown that contextual interactions over time determine if biophilia is actualized (e.g., Hand et al., 2017; Van den Born, Lenders, De Groot, & Huijsman, 2001). Environmentally focused proximal processes occurring in the mesosystem, primarily person-person-nature (e.g., Dresner et al., 2015; Stapleton, 2015), and person-nature interaction in the microsystem (e.g., Cox & Gaston, 2016), have the strongest influences over the actualization of biophilia; however, many of these interactions are only available because of opportunities developed in the exosystem.

Studies have focused on the role of familial influence (Grønhøj & Thøgersen, 2012), educational influence (Prévot, Clayton, & Mathevet, 2016), peer influence (de Pinho et al., 2014), and individual emotional influence (Bissing-Olson et al., 2016) in the development of proenvironmental behavior, which is an essential component of ecological citizenship; however, no study was found that focused on how agents in the exosystem perceived their role in the development of ecological citizenship. Agents in the exosystem include NGO staff, institutions, environmental agencies, environmental program developers, state environmental agencies, and legislators (Bronfenbrenner & Morris, 2006). This gap in understanding how ecological citizenship can be developed by external political actors through in-direct methods can inhibit public policy success.

Bioecological Model and State Political Actors, State Organization Partners, and NGOs

The bioecological model has undergone several changes since it original development and has been named the ecological systems theory, socio-ecological model, and finally the bioecological model. The databases identified in the literature search strategy were searched using *bioecological model* + *ecological citizenship*, which yielded zero results; however, *bioecological model* + *proenvironmental behavior*, *bioecological model* + *conservation*, *bioecological model* + *ecological footprint*, and *bioecological model* + *carbon cycle* all produced results ranging from 1 to 164. These search keywords were selected because they are key components and goals of ecological citizenship; however, none were applicable to this study. The original search strategy for the study began with the ecological citizen and worked backward toward childhood and biophilia. When this same process was applied to the bioecological model and the research questions, a clear path was found in the literature between the PPCT model, research questions, and the individual (Figure 3).

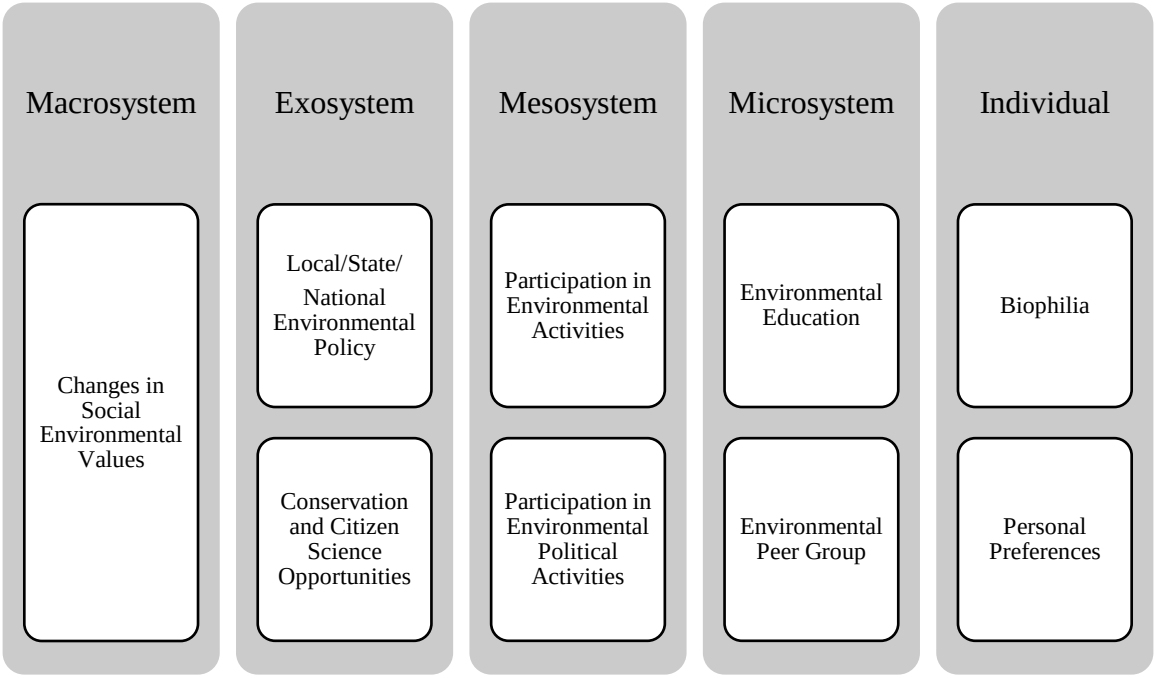

Figure 3. Ecological citizenship within the bioecological model.

This study's research questions focus only on actors within the exosystem and macrosystem. The first research question—What roles do state legislators and agents perceive that state governments can play in fostering ecological citizenship among residents in their states? —focuses on the relationship between the exosystem and individual systems through a macrosystem lens and is well supported in the literature. While developing the bioecological model, Bronfenbrenner often argued that many challenges within families that affected child development was the result of public policy (Bronfenbrenner & Morris, 2006).

Many studies on public policy that utilize the bioecological model focus on education (e.g., Connors, 2016; Rabiner, Goodwin, & Dodge, 2016), criminal activity (e.g., Fleming, Guttmannova, Cambron, Rhew, & Oesterle, 2016; Pittenger, Huit, & Hansen, 2016), athlete development (e.g., Domingues & Goncalves, 2014; Mahoney,

Gucciardi, Mallett, & Ntoumanis, 2014; Uehara, Button, Falcous, & Davids, 2016), and community resilience (e.g., Didkowsky & Ungar, 2016; Shuey & Leventhal, 2017). Hill et al. (2015) noted that vulnerable ecosystems can be protected, and carbon footprints reduced when governments promote environmentally friendly behavior by supporting environmental social movements rather than eliciting behavior through laws and regulations.

Within the U.S. grasslands, state wildlife action plans outline the state's current environmental health and what the state will implement to address environmental health issues. These plans include a public policy approach as well as a reliance on agencies and NGO partners to promote proenvironmental behavior that will aid, rather than hinder, the action plan (Rohweder, 2015). Kollmuss and Agyeman (2002) noted that potential barriers to proenvironmental behavior include institutional barriers created through institutional decisions. Reese and Jacob (2015) found that environmental justice, policies developed to elicit environmental behavior that distribute environmental care, and intergenerational norms and values greatly influence proenvironmental behavior. This multidirectional influence is central to the bioecological model and further investigation into the relationships between agents that create public policy and community programs is needed (Figure 4).

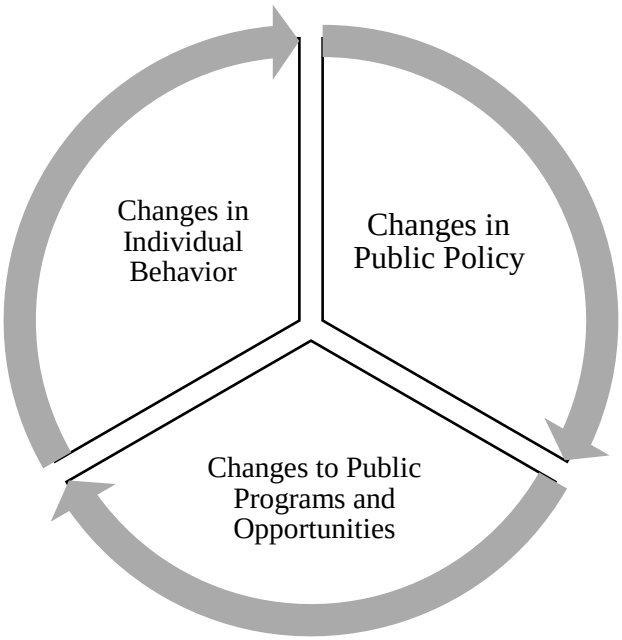

Figure 4. Nature of behavioral influence.

Whereas the first research question focused on state legislators and agents, the second and third research questions bring ecological citizenship development a little closer to the individual while maintaining enough distance to be considered a primarily non-direct agent of influence. State organization partners and NGOs are a buffer between public policy and individual environmental action that can greatly influence the development and display of ecological citizenship without the need for more laws and regulations. Public programs and environmental opportunities directly influence the individuals involved, but also indirectly influence the entire community through improved environmental health.

Many researchers have focused on the role of environmental education (e.g., Chankrajang & Muttarak, 2017; de Leeuw et al., 2015; Liefländer & Bogner, 2014) and managed biodiversity (e.g., Muratet et al., 2015; Palliwoda, Kowarik, & von der Lippe,

2017; Shwartz et al., 2014) in the development of proenvironmental behavior and ecological citizenship. Both environmental education and managed biodiversity are made possible by state organization partners and NGOs within the region. King (2016) noted that entities in the exosystem are often perceived as "waiting to be called upon by the individual or the community" (p. 139). Many state organization partners, such as the Iowa Conservation Union and Nebraska Wildlife Society, often work with state and local lawmakers to create effective environmental policy; while many NGOs, such as the Great Plains Native Plant Society and Iowa Association of Naturalists, interact with individuals and communities that have sought out environmental knowledge and volunteer opportunities. The exosystem holds communal resources that are available to all members of the community (King, 2016).

Understanding how the individuals holding those resources perceive their roles in the development of ecological citizenship is needed to better understand how the community utilizes those resources. Kollmuss and Agyeman's (2002) study identified barriers to proenvironmental behavior, which contributes to the development of ecological citizenship, including: lack of environmental knowledge, lack of participation opportunities, and cultural norms. Applying the bioecological model to ecological citizenship development allows this study to address these barriers and determine if they affect residents in the grasslands.

Linking the bioecological model to the development of ecological citizenship required many substitutions in keywords and required the use of non-equivalent contexts. These substitutions highlight a gap in literature on the bioecological model which will be

reduced by this study. As shown in Figure 3, the bioecological model and the PPCT framework can be applied to the development of any environmentally aware individual. A child is born with an innate desire to connect to nature, but this desire can be changed through experiences with family, friends, and institutions. Many of these institutions, such as schools, wildlife centers, and community centers, are shaped by public policy. Few experiences are made possible without some form of influence by external forces. The bioecological model allows for the identification of select groups within the exosystem. In this study, I focus on selected political actors and explore their perceived roles in the development of ecological citizenship within their community and is well grounded by the theoretical framework.

This section outlined the bioecological model and PPCT framework that guided this study. Both the bioecological model and ecological citizenship note the multi-generational nature of human development and blend well to create a strong foundation for this study (Figure 5). The following sections of this literature review explores ecological citizenship potential within each system of the bioecological model.

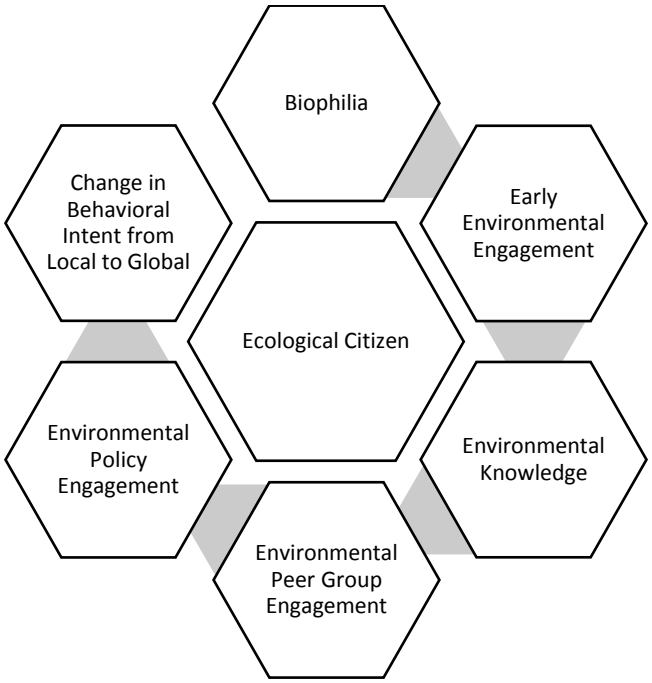

Figure 5. Development of ecological citizenship.

Ecological Citizenship and the Bioecological Model

Ecological citizenship "deals in the currency of non-contractual responsibility … inhabits the private as well as the public sphere … refers to the source rather than the nature of responsibility … works with the language of virtue, and it is explicitly non-territorial" (Dobson, 2003, p. 89). This definition and position that ecological citizenship is a distinct form of citizenship; however, is not universally accepted. Hayward (2006) argued that "ecological citizenship should be understood as giving distinctive substance to a more conventional understanding of citizenship" (p. 435).

There is a deep connection between ecological citizenship, ecologism, and deep ecology as Dobson (2003; 2012) implies that ecological citizens are the manifestation of ecologism. While agreeing with the substance of Dobson's position, Hayward (2006) disagrees with the "theoretical framing of the normative substance" (p. 445). Dobson

(2003), Hayward (2006), and other researchers (e.g., Blüdorn, 2011; Nasango & Gabsa, 2000) agree on one main concept that drives deep ecology, ecologism, and ecological citizenship: eliciting individual behavioral change requires institutional changes and is dependent on the quality of environmental interactions. These requirements can be clearly identified using the bioecological model. The following is a brief exploration of ecological citizenship development when focusing on the contextual framework of PPCT and what is known and unknown about these proximal processes.

Ecological Citizenship and the Individual: Biophilia

In 1984, Wilson "suggested that the urge to affiliate with other forms of life is to some degree innate" (p. 85). Wilson (1984) also believed that, at that time, this hypothesis of biophilia had "not been studied enough in the scientific manner of hypothesis, deduction, and experimentation to let us be certain about it one way or the other" (p. 85). In the past 33 years, however, biophilia has been well studied in a variety of environmental, ecological, and educational situations (e.g., Hand et al., 2017; Profice, Santos, & dos Anjos (2016); Zhang, Goodale, & Chen, 2014). Two study areas on biophilia provide substantial support for the development of ecological citizenship: public greenspace and urban lifestyles.

Studies on public greenspace often focus on managed biodiversity in public parks (e.g., Lin, Fuller, Bush, Gaston, & Shanahan, 2014; Twedt, Rainey, & Proffitt, 2016); however, studies have shown that access to public greenspace is not equitable which can, as explained by Bronfenbrenner and Ceci (1994), create unequitable individual growth and development caused by the variation in proximal processes. For example, Schüle,

Gabriel, and Bolte (2017) found that low socioeconomic neighborhoods faced decreasing public greenspace which negatively impacts the neighborhood's health and well-being, while Chen and Chang (2015) argued that inequity was caused not by socioeconomic status of the neighborhood but was caused by inequitable access to public greenspace caused by lack of transportation. These two examples highlight the influence public policy and political agents have on the development of biophilia due to policies such as transportation and social programs for low-income individuals. Public greenspace is only one possible source of interaction with nature within an urban setting. Urban lifestyles also play a key role in the development and nurturing of biophilia.

Urban lifestyles undergo many changes when cities embrace biophilia and become biophilic cities. Biophilic cities put "nature first" in their "design, planning, and management" (Beatley, 2011, p. 45), which reduces the need for separate public greenspace. Newman (2013) found regardless of a city's density, public greenspace could be increased through rooftop gardens, natural building façades, roadway treatments, and pedestrian park connectors. Public greenspace and biophilic city design takes place primarily in the exosystem but is driven by changes in the macrosystem and microsystem as changes in the environment drive changes in individual behavior which further drives change in cultural norms and values. Experiences with urban nature within a biophilic city increases a city's resilience (Beatley & Newman, 2013; Pearson, Newton, & Roberts, 2014; Spirn, 2014) and increases an individual's sense of place (Beatley & Newman, 2013; Russ, Peters, Krasny, & Stedman, 2015). Increasing an individual's sense of place increases stewardship behavior and proenvironmental behavior that can

expand beyond the urban setting (Chapin & Knapp, 2015; Chapin, Sommerkorn, Robards, & Hillmer-Pegram, 2015).

Ecological Citizenship in the Microsystem and Mesosystem: Proenvironmental Behavior

Kollmus and Agyeman (2002) described any behavior that "seeks to minimize the negative impact of one's actions on the natural and built world" (p. 240) as proenvironmental behavior. Building off Wilson's hypothesis on biophilia, proenvironmental behavior is a natural outcome of individual environmental growth and development (Gifford & Nilsson, 2014; Soga & Gaston, 2016). Researchers have found that an individual's disposition toward nature is guided by personal preferences (e.g., Soga et al., 2016), intrinsic motivation (e.g., Steg, 2016; Van der Werff, Steg, & Keizer, 2013), communal values (e.g., de Pinho et al., 2014; Seifert & Shaw, 2013), and can be altered through managed biodiversity (e.g., Muratet et al., 2015; Schwartz et al., 2014).

As children age, their individual biophilia gives way to social and peer pressure (e.g., Krettenauer, 2017; Soga et al., 2016). As adults, proenvironmental behavior is often determined through social connections (Dresner et al., 2015; Hausmann et al., 2015), emotional manipulation (Bissing-Olson et al., 2016; McKinley et al., 2016), financial reward or punishment (Rohweder, 2015), and environmental knowledge (Lewandowski & Oberhauser, 2015). Researchers have also found that environmental engagement is subject to outside influences such as television, video games, and non-environmental activities (Schaal & Lude, 2015). These outside influences affect individuals directly through organizational program participation (e.g., Rohweder, 2015;

Silvertown et al., 2013), and indirectly through social programs and public policy (e.g., Glucker et al., 2013; Harris, Becker, Nielsen, & Mclaughlin, 2015).

Dickinson and Crain (2014) studied external influence over individual behavior through a uniquely 21st century medium: The Internet. Their study found that the social aspects that Dresner explored in Portland volunteers can also be found online through social networks and crowd-sourcing. Agencies and organizations are now promoting the ability to participate in citizen science programs through smart phones and submit data online via specialized sites (Ferster & Coops, 2016; Sullivan et al., 2014). The data collected by citizen scientists and other environmental volunteers allow policy makers, environmental partners, NGOs, and other organizations, located in the exosystem, to develop more comprehensive and direct policies and programs that will affect non-participants in the program through the mesosystem (Sullivan et al., 2014).

Ecological citizenship is the combination of proenvironmental behavior and public participation in the political process (Dobson, 2003). This relationship is circular, and studies have approached it from a variety of directions. Jagers et al. (2011) concluded that "Ecological Citizenship ideals, among people in Sweden, are clearly linked to voluntary pro-environmental behaviour" (p. 22) with ecological citizenship being the precursor to proenvironmental behavior. Kelly and Abel (2012), however, found that environmental service-learning experiences increased proenvironmental behavior and aided in the development of ecological citizenship principles in college students. Dobson (2003) suggested that ecological citizenship is built from individual actions that were developed through individual experiences. This belief is clearly

supported by the bioecological model as the proximal processes found in the PPCT framework aid in individual development over time and serve as an essential component to maximizing individual potential. Barriers to proenvironmental behavior and how these barriers can be overcome from an individual perspective has been well-studied (Kollmuss & Agyeman, 2002), yet little is known on how external agents perceive their principal role in providing access to nature, environmental education opportunities, and other factors that aid in the solidification of biophilia and the development of proenvironmental behavior upon which ecological citizenship is built.

Ecological Citizenship in the Exosystem and Macrosystem: Creating Social Change

Ecological citizenship is viewed as a necessity if future generations are to be ensured a sustainable environment (Francis, 2015); however, the question of whether ecological citizens exist has been debated since Dobson's first description of ecological citizenship in 2003 (e.g., Hayward, 2006). This debate, at least in Europe, has largely been solved since Jagers (2009) studied 3000 Swedes between 15 and 85, and concluded that nearly 25% were ecological citizens based on their willingness to act. In Jagers' (2009) study, the average ecological citizen was a "young (15-29 years old) well-educated woman living in one of the largest cities and sympathizing with either the Green or Left Party" (p. 32).

Dobson's (2003) ecological citizenship, as a political theory, rests in the realm of adults and their interaction with the world around them; however, Jagers' study showed that ecological citizenship was not just a political theory. Bronfenbrenner's bioecological model can be applied to determine how each system assists in the development of

ecological citizens from birth to active political members in their community and the world. Proenvironmental behavior resides in the personal systems of the microsystem and mesosystem but is heavily influenced by the exosystem and macrosystem. Lummis et al. (2016), Wright (2015), Islar (2016), Scoville (2016), and Melo-Escrihuela (2015), all examined ecological citizenship development within the personal systems, but each noted that further study was necessary to fully understand how ecological citizenship was developed.

This section described the flow of environmental social change from the individual to the social level as promoted by the bioecological model, but as Bronfenbrenner and Ceci (1994) noted, the flow of influence also flows from the social level to the individual. The next section of this literature review explores how previous generations have inspired the next generation through social changes that led to the rise of the environmentalist and a call for a new type of citizen.

Rise of Environmentalism and the Call for a New Theory of Citizenship

John Muir (1911) wrote, "When we try to pick out anything by itself, we find it hitched to everything else in the Universe" (p. 35). Environmental concern began as an individually driven belief that grew through centuries of cultural interaction. Early pioneers in environmental concern were philosophers, religious leaders, and royalty (Holdgate, 2014; Jones-Walters & Čivić, 2012; Navarro & Pereira, 2015). As time passed individual environmental concern became communal concerns as communities grew and the local environment was affected by human activity. This shift from individual to communal concern emerged globally in the 17th and 18th centuries as the

Massachusetts Bay Colony prohibited animal abuse (Eliot, 1963, p. 79), London residents addressed air pollution through the creation of city parks (Evelyn, 1976) and Tokugawa fought against deforestation by replanting trees in Japan (Marcon, 2015). New communal concerns created changes in the cultural norms and paved the way for a new generation of environmentalists that would continue shaping cultural norms for another century.

The early 19th century was filled with technological advancements (e.g., Bickel, 2015; Lienhard, 2015; Witkowski, 2016), increased protection of human health and wellbeing (Rosen & Imperato, 2015), and increased animal protections (Ingram, 2013). Where the environmental approach of the 18th century was through public policy, the 19th century approach was through scientific and naturalist writers who brought nature to the public (Philippon, 2004). Emerging environmental themes during this time included species identification and understanding how they are affected by the environment (Audubon, 1843; Darwin, 2008; Marsh, 1907), and introducing the beauty of nature to those living in growing urban centers (Muir, 1916; Thoreau, 2011), and the importance of green space (Gould, 1888; Olmsted, 1852; Olmsted, 1881). This renewed interest in the human-nature relationship inspired a new generation of environmental authors, activists, and political agents in the 20th century that would catapult environmental care and concern into global agenda status.

Beginning in the late 1890s and early 20th century, organizations began forming whose sole purpose was to protect the environment through public education, policy, and citizen science (Cohen, 1988). Between 1872 and 1915, United States law makers were

also working to protect the environment through the various acts of legislation and executive action, such as the establishment of Yellowstone, Yosemite, and Sequoia National Parks (Yellowstone National Park Protection Act of 1872, 2016; Sequoia and Yosemite National Parks, 2016), and establishment of the first national bird reserve in Florida (*Pelican Island Reservation for protection of native birds,* 1909). By the mid-20th century there were dozens national parks, refuges, and reserves that were managed by new state and federal agencies created to address environmental needs in the United States. A new environmental cultural revolution began in 1962 with the publication of Carson's *Silent Spring* (Lear, 1993).

In *Silent Spring*, Carson (2002) depicted a fictional town where the environment had been destroyed by nuclear fallout and pesticides, then presented an argument against pesticide and chemical use in the United States. Carson's work, and other environmental voices of the early 1960's were so strong that President Kennedy ordered scientific investigations into the use of pesticides, and in 1972 DDT was banned in the United States (Lear, 1993). Like Theodore Roosevelt, Franklin Delano Roosevelt, and Lyndon Johnson, President Nixon's administration was an environmental administration that created national policies protecting air, water, and flora and fauna that continue to frame United States environmental policy (Lazarus, 2014). The rise of environmental care and concern from individual belief to communal action and changed public policy was not limited to pesticides and national policy. The United Nations, during the 1960s and 1970s, also created environmental policy because of global environmental cultural change.

International response to environmental care and concern in the 1970s included the creation of the United Nations Environment Programme (Johnson, 2012) and the *Convention on International Trade in Endangered Species of Wild Flora and Fauna* (1973). International approaches valued scientific exchange, assessment, and promotion of environmental needs within cultural contexts (United Nations Environment Programme, 2012. These policy themes continued throughout the 20th century to build off communal demands for a cleaner environment through transnational meetings and conferences that created a vast network of international policies that recognized global needs (United Nations Environment Programme, 2012). For the last 30 years, United Nations environmental programs and policies have evolved to encompass all aspects of environmental need (United Nations Environment Programme, 2012). International policy, however, still relies on national policies that support the global demand for a sustainable, healthy environment. The Paris Agreement (United Nations, 2016), for example, stipulates that "each Party shall prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve" (Art. 4, para. 2) and that member nations report national contributions to the United Nations.

Late-20th century and early-21st century environmental policy in the United States has expanded beyond fundamental air, water, and species protection (e.g., National Organic Program, 2015). Federal and state environmental agencies create partnerships with NGOs and institutions through State Wildlife Action Plans to create pathways for individuals to become involved in environmental policy and protection in their states (e.g., Rohweder, 2015; South Dakota Department of Game, Fish, and Parks, 2014;

Zohrer, 2012). As political agents are working from a top down position, environmental organizations and citizen action groups are working from a grassroots level to progress environmental protection (Dryzek, 2013; Mihaylov & Perkins, 2015). One common theme that both the top down and bottom up approach share is the need for public participation (United Nations Conference on Environment and Development, 1993; Rohweder, 2015; Zohrer, 2012).

Public participation in environmental policy manifests in a variety of forms including participation in citizen scientist programs, direct participation in the rulemaking process, and participation in state-based programs (Eden, 1996; Ellwood, Crimmins, & Miller-Rushing, 2016; McKinley, 2016; Rohweder, 2015). The introduction of direct public participation in the environmental political process also introduced new theories on sustainability, governance, and citizenship (Dobson, 2003). One such theory, deep ecology, was first presented by Arne Naess at the Third World Future Research Conference in 1972. The following section explores the relationship between deep ecology which formed the foundation for ecological citizenship.

Deep Ecology

Deep ecology, like *Silent Spring* and *My First Summer in the Sierra*, is the product of an individual involved in grassroots environmentalism that inspired others to think differently about the environment and their role in its existence. Naess (1973) described the 1960s and 1970s environmental movement as having two levels: "A shallow, but currently rather powerful movement and a deep, but less influential movement" (p. 95). For Naess, the shallow environmental movement's primary concern

was wealthy nations, which largely ignored the "deeper concerns, which touch upon principles of diversity, complexity, autonomy, decentralization, symbiosis, egalitarianism, and classlessness" (p. 95).

In 1984, Naess and Sessions presented a revised and more formalized set of eight principles of deep ecology that would help solidify the deep ecology movement and create a formal platform for green politics. These eight principles are (a) everything on Earth has an inherent value, (b) these values are actualized through species richness and diversity, (c) humans are obligated to protect species richness and diversity, (d) humans are overpopulating the Earth, (e) humans are increasingly interfering with nature, (f) changes in public policy are necessary, (g) quality of life is more important than status in life, and (h) proenvironmental individuals are obligated to participate in environmental policy change (Naess & Sessions, 1984).

Deep ecology has been studied in a variety of environmental and philosophical studies over the last 30 years to varying degrees (e.g., Burns & Briley, 2015; Kopnina, 2015; Kopnina & Cherniak, 2015; Smith & Gough, 2015). Hedlund-de Witt, de Boer, and Boersema (2014) found that proenvironmental behavior, and other key aspects of deep ecology, was closely associated with the individual's worldview, which supports the connection between the macrosystem and the individual through environmental proximal processes. While deep ecology was being developed as a philosophical ideology during the 1970s, other environmental theorists were questioning the relationship between humans, political systems, and the environment, and were heavily influenced by deep ecology. One result of this inquiry was the development of ecologism, green political

theory, and its associated ecological citizen. The following section presents a comprehensive literature review of what ecological citizenship is and what it is not, actors involved in its development, and why ecological citizenship development must to be studied further.

Ecological Citizenship

The relationship between humans and nature has fascinated people for centuries and has produced a variety of perspectives ranging from anthropocentrism to biocentrism. Anthropocentrism stipulates that "human interests" are given preferential treatment regardless of the "expense of the interests or well-being of other species or the environment" (Barry & Frankland, 2014, p. 19). While anthropocentrism is found in major religious texts and framed cultural thought for centuries (e.g., Chandler & Dreger, 1993; Snodgrass & Gates, 1998; White, 1967), the transition from humans being separate from nature to humans being a part of nature, biocentrism, and the need to act as caretakers took hold as a change in social norms in the 19th century (Emmenegger & Tschentscher, 1993). Emmenegger and Tschentscher (1993) argued that one key transition point was the development of utilitarianism.

Utilitarianism and the rise of the environmental philosophy can be seen through the multi-generational nature of ecological thought. Utilitarians, such as Jeremy Bentham (1996) and John Stewart Mill (1901), argued that the individual would maximize their own pleasure without thinking of others' pleasure, but when individuals are part of a group, they will maximize the pleasure of the group. When utilitarianism is applied to environmental behavior, participants in environmental volunteer opportunities

are maximizing individual pleasure and contributing to the happiness and well-being of others in their community (e.g., Dresner et al., 2015). Shifting from anthropocentrism to biocentrism, or ecocentrism, requires a change in personal values and ethics (Francis & Si, 2015; McShane, 2014). These changes can be accomplished through laws and regulations, but the result would be temporary (Francis & Si, 2015). Pope Francis (2015) wrote that "Only by cultivating sound virtues will people be able to make a selfless ecological commitment" (Chapter 6, section 211). Sound virtue is a key tenet in ecological citizenship (Dobson, 2003) and is found throughout the literature on environmental behavior.

Environmental behavior literature often blends ecological citizenship and environmental citizenship, as being interchangeable; however, they are very different, yet "complementary" views with the same result in mind (Dobson, 2003, p. 89). Environmental citizenship and ecological citizenship promote environmental behavior and the development of sustainable communities, but the underlying virtues are quite different. Environmental citizenship often relies on liberal methods of laws, rules, and regulations to elicit the desired environmental behavior (Agyeman & Evans, 2006; Barry, 2006; Dobson, 2003).

This view of environmental citizenship focuses on the rights of individuals within a specified territory (Barry, 2006; Dobson, 2003). For example, Bell (2005) argued that environmental citizens have a right to environmental goods, a right to participate in environmental policy making, and a right to take legal action when those rights are denied. Legal action on behalf of individual rights to environmental goods often takes

the form of citizen suits by environmental organizations (e.g., *Center for Biological Diversity v. Environmental Protection Agency*, 2017; *Defenders of Wildlife v. Zinke*, 2017). Environmental citizenship can also view individual rights through a contractual duty lens (Barry, 2006; Dobson, 2003).

Bell (2005) argued that the state, and its designated actors, has a duty to make environmental law, and individuals and organizations have a duty to follow that law. The argument for environmental duty calls into question whether it is a moral duty and obligation or a legal duty and obligation (MacGregor, 2006). Environmental citizenship scholars argue that it is a legal duty and obligation in which government is held to provide common environmental goods for the residents within their territory, and it is the legal duty and obligation of residents to promote the common environmental good provided by the government (e.g., Bell, 2013; Dobson, 2003). Many liberal and civic republican responses to environmental need is to create laws for the public to follow, and to create programs that provide financial incentive for participation; however, compliance is often challenged or minimized through other public policy, and public participation in incentivized programs is often low. The lack of active, willing participation supports Pope Francis' (2015) belief that forced behavioral change is temporary. Dobson (2003), argued that neither liberal nor civic republican approaches, and in turn environmental citizenship, would produce the best results to meet the growing environmental need, but rather a third form of citizenship, postcosmopolitan citizenship, was needed to address environmental need.

Postcosmopolitan citizenship focuses on non-contractual duties and obligations, is non-territorial, and values feminism (Dobson, 2003; Valencia Sáiz, 2005). It is under this theory of citizenship that ecological citizenship is developed. Promoting non-contractual duties and obligations endorses a moral obligation to the local community and the world (Dobson, 2003; Francis, 2015). It embraces utilitarianism with a global emphasis where developed nations have a moral obligation to reduce individual and communal footprints more than is necessary so that other, less developed nations, can maximize use and utility of their natural resources until they are able to maintain a healthy ecological footprint (Mason, 2014; Vaz & Bina, 2004). Ecological citizens recognize that the environment is not bound by national boundaries, and that its resources are limited and must be protected for future generations (Dobson, 2003). Since local and national boundaries do not constrain ecological citizenship, its influence can be felt globally as individuals act in the best interest of the global citizen.

One global response to the environmental and communal needs of future generations is the United Nations Sustainable Development Agenda and its 17 goals for sustainable development. These goals include ending poverty and global hunger, global gender equality, and ensuring quality education throughout the world (United Nations, n.d.). Achieving these goals requires everyone "to do their part: governments, the private sector, civil society and people like you" (United Nations, n.d., para. 1). Eight of the UN's 17 goals to achieve by 2030 directly address environmental needs: clean water and sanitation, affordable and clean energy, sustainable cities and communities, responsible consumption and production, climate action, life below water, life on land, and

partnerships (United Nations, n.d.). The ecological citizen addresses each of these eight goals individually through reducing their personal ecological footprint. Each of these eight goals are also addressed as a common goal through sustainable consumption and sustainable development.

Sustainable Consumption

Sustainable consumption is the 12th goal of the United Nations Sustainable Development Agenda and "requires a systemic approach and cooperation among actors operating in the supply chain, from producer to final consumer" (United Nations, n.d., para. 2) to ensure a healthy Earth for future generations. This goal has 11 benchmarks for nations to achieve by 2020 and 2030 including cutting global food waste by 50%, increase environmental education that promotes sustainable lifestyles, and promote sustainable consumerism (United Nations, n.d.). These goals are well-supported by the ecological citizen paradigm as the ecological citizen expands care and concern for the global environment into their daily lives.

Global food waste is estimated at 33% (United Nations, n.d.), but in the United States, food waste is estimated as 30-40% according to the United States Department of Agriculture in 2014 (Buzby, Wells, & Hyman, 2014) and nearly 50% according to Feeding America (n.d.). Seyfang (2006) argued that "ecological citizenship rises above traditional understandings of citizenship to embrace new possibilities, in particular the development of consumption as a site of political activity and sustainable consumers as a key element of government strategy" (p. 387) and found that ecological citizenship influenced participation in local organic food networks which promoted sustainable

consumption, but also found that "education, outreach, and community" (p. 393) stemming from the local organic food network also influenced the development of ecological citizenship. This multi-directional influence is key to both ecological citizenship and the bioecological model.

Seyfang's findings were supported by Annunziata and Vecchio (2016) who found that 40% of their study's respondents perceive organic food as being better for the environment and 30% believe organic food preserves biodiversity; however, 23% of respondents stated they would not buy organic food because of too many labels, and 18% reported a lack of sufficient information. These findings aid in the reduction of ecological footprints through local consumerism, but also highlight the influence of public policy on food purchasing habits. O'Kane's (2016) findings also create a connection between ecological citizenship's tenets and sustainable consumption but found that shopper's perception of food degraded the further removed they are from the source. Using a version of the socio-ecological model like Bronfenbrenner's, O'Kane (2016) found that macro-level changes, including food marketing and media, food policies, food distribution systems, and cultural norms, were required if sustainable consumption was to improve in Australia. Changes in policy can elicit changes in sustainable consumption, and these changes can elicit changes in sustainable development.

Sustainable Development

Dobson (2007) noted that changes in environmental behavior through financial incentive, either as a charge or as a rebate, produced remarkable results in the short-term,

but failed to elicit individual behavioral changes for the long-term; however, these short-term changes effectively reduced ecological footprints and could be used to change public perception to create long-term results. Sustainable development is, in short, economic growth without negative environmental impact (United Nations, n.d.). The United Nations' 17 goals for sustainable development has been called idealistic in that it fails to recognize the influence that political ideologies have on individual behavior (Huckle & Wals, 2014). Huckle and Wals (2014) posited increases in global environmental education with a focus on ecological footprints is needed if sustainable development is to be achieved.

Education is a key theme found throughout sustainable development, sustainable consumption, and ecological citizenship. Francis and Si (2015) wrote that "Environmental education should facilitate making the leap towards the transcendent which gives ecological ethics its deepest meaning" (Chapter 6, section 210). Hands-on environmental education and its connection to ecological citizenship has been well studied (e.g., Lummis et al., 2016; Mannion, Biesta, Priestley, & Ross, 2011; Travaline & Hunold, 2010), and findings suggest that education, itself, has a positive influence on individual behavior (e.g., Schindel Dimick, 2015; Schinkel, 2009; Tidball & Krasny, 2010), but this influence is moderated by internal preferences and communal norms and values (e.g., Bergman, 2016; Curtis, 2009; Soga et al., 2016).

This review of ecological citizenship and its key components has shown exactly how it differs from environmental citizenship. Ecological citizens concern themselves with not only their friends and neighbors, but others within their community and the

world. They act out of moral obligation and altruism. Development of ecological citizenship requires changes in social norms and values, but social norms and values change over time as individual norms, values, and social demands change. This circular nature of development can be explored using the bioecological model. The following section explores actors involved in the development of ecological citizenship as found in the literature.

Actors Involved in the Development of Ecological Citizenship

Ecological citizenship development begins with the individual's first experience with nature (Zhang, Goodale, & Chen, 2014). Herrmann, Waxman, and Medin (2010) found that urban youth develop anthropocentrism between ages 3 and 5 and is a learned behavior. The early adoption of anthropocentrism also implies that biocentrism can also be adopted early in the right environment. Environmental care, concern, and knowledge begins within the home and family dynamic (Francis & Si, 2015). De Leeuw et al. (2016) found that even in teenagers, family environmental actions are strong influencers of environmental behavior.

Extended families, peer groups, and community influence also aid in the development of environmental behavior, including ecological citizenship (Cheng & Monroe, 2012). Studies have shown that perceived value of the species (e.g., Bencin, Kioko, & Kiffner, 2016; Shapiro et al., 2015), perceived species beauty (e.g., de Pinho et al., 2014; Manesi, Van Lange, & Pollett, 2015), and social opportunities created through conservation activity (e.g., Dresner et al., 2015; Prati, Albanesi, & Pietrantoni, 2017; Stapleton, 2015) all influence the development of environmental behavior; however,

these influences also vary from community to community which makes predicting environmental behavior for large geographic areas complicated.

The factors that influence the development of ecological citizenship presented so far are direct factors that engage the individual on a regular basis. Teachers, friends, neighbors, and family all reside in the microsystem and help shape individual growth and development through introduction and support of family and communal norms and values. Shapiro et al. (2015), found that children on Andros Island in The Bahamas valued species based on "ecological significance and endemism" ("Discussion", para. 1), but this valuation changed to highlight species population size after participation in a youth education program. While development of ecological citizenship in young children begins in the home from direct influence from parents and family (Francis & Si, 2015), indirect agents of influence quickly become involved as the child's environment expands to local parks, children's museums, schools, youth activity groups, and the organizations and policies that provide these social opportunities.

As noted earlier, environmental behavior can be elicited through rules, regulations, and financial incentives through state political entities which indirectly influences ecological citizenship development in children; however, this influence may be temporary as policies change over time. This does not imply, however, that public policy has a diminished role in the development of ecological citizenship. It could be argued that public policy has a larger, but partially unexplored, influence on the development of ecological citizenship. For example, United Nations Sustainable Development Goal 15 (n.d.) aims to, "protect, restore and promote sustainable use of

terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss", but does not explicitly state how nations are to achieve this goal; however, international agreements, such as the Paris Agreement, hold nations accountable for reporting how, or if, that nation has met its goal. The goal, nonetheless, has the power to influence individual ecological citizenship development through national and local policies, and local program opportunities.

The United States Department of Fish and Wildlife, Environmental Protection Agency, and the National Oceanic and Atmospheric Administration share primary responsibility for creating national policies that directly affect environmental health and wellbeing in the United States. In 2016, a total of 1,029 notices, proposed rules, and rules were recorded in the *Federal Register* that involved the Endangered Species Act (ESA) ranging from listing the oceanic whitetip shark as a threatened species (Endangered and Threatened Wildlife and Plants, 2016) to increasing monetary penalties for violating the ESA (Civil Penalties, 2016). These policies require state compliance, which impacts all residents and visitors regardless of their direct involvement with the policy.

States develop local policies to address local environmental needs in addition to meeting national needs. Since 2000, states have developed a state wildlife action plan that outlines the environmental needs and goals of the state, as well as outlines an implementation plan for meeting those goals (Rohweder, 2015). Each of the state's wildlife action plans highlight the need for public participation and creates partnerships with local and national environmental organizations (such as the Audubon Society and

Ducks Unlimited) to create programs that will increase public participation so that the state may meet its 10-year goal. Participation in local programs increases environmental awareness within the microsystem, which influences environmental awareness within the home. Introducing innovative ideas at any stage of influence could influence the development of ecological citizenship within the region due to the highly fluid multi-directional nature of direct and indirect influence.

Scholars have primarily focused on direct relationships that influence ecological citizenship, and proenvironmental behavior, development: parent-child, child-teacher, and child-child (e.g., Hayward, 2012; MacGregor, 2011; Soga et al., 2016). Some scholars, like Melo-Escriheula (2008) argue that ecological citizenship cannot be fully developed without a transition within the state towards a green state; however, Rimer, Lynes, and Hickman (2013) argue that youth are at the forefront of necessary cultural and social changes necessary to develop ecological citizenship. These contrary findings support the assumption that ecological citizenship development can begin at any point within a lifespan because each generation influences and impacts each other.

Chan et al. (2016) noted that cultural change, or communal change, is required for ecological citizenship development because ecological citizenship, unlike proenvironmental behavior, impacts more than individual behavior. Dobson (2009) argued that ecological citizenship transcends all borders to create a global personal and political motivation to value future generations above immediate personal demands. The development of an ecological citizen benefits not only the individual through improved social connections (Dresner et al., 2015) and other effects of biophilia (Wilson, 2009),

but it benefits the local community and the global community through increased awareness of the connection between individual action and its impact on the future.

Understanding how ecological citizenship is developed and the role of in-direct sources of influence aid or hinder that development is imperative yet has remained unexplored in the literature. This study aims to fill that gap in understanding by focusing on selected exosystem agents and their willingness to take action within their community. An individual's willingness to take action directly measures how ecological citizenship can be passed from one generation to the next without the need for additional policies that inhibit the individual's acceptance of their role in protecting the grasslands. The next section of this literature review presents a brief overview of the methodologies and instruments used by other scholars, and how this study will add to the body of knowledge and understanding of how ecological citizenship is developed.

Methodology and Instrumentation in the Literature

A simple literature review relays what is known about a topic, what is not known, and how that gap in knowledge can be filled (Machi & McEvoy, 2016). Ecological citizenship, as presented in this study, consists of three distinct components: biophilia, proenvironmental behavior, and ecological citizenship. Each component has been studied to varying degrees, but there remain many unknowns within each component. This section of the literature review examines the methodology and instrumentation most common to biophilia and proenvironmental behavior components, and how these studies shaped this quantitative study.

Methodology and Instrumentation: Biophilia Research

Biophilia was coined by Wilson (2009) in 1984 to describe the innate desire to connect to nature and has served as a key theme in over 10,000 peer-reviewed studies. Literature on biophilia often relates to how an individual's relationship to nature influences environmental behavior, yet there are few empirical studies that have explored that connection directly (Zhang, Goodale, & Chen, 2014). Martin-Lopez, Montes, and Benayas (2007) interviewed 672 individuals in Southwest Spain to better understand individual attachment to nature and their associated willingness to pay for biodiversity protection, and found that while individuals clearly had biophilic tendencies, an individual's willingness to pay was "human-centered" and "based mostly on the individual's non-economic motives" (p. 77). Martin-Lopez et al., focused on adults using a natural area in Spain, but biophilia has more often been used to explore the relationship and connection to nature from a child's perspective.

Ballouard, Provost, Barre, and Bonnet (2012) explored this connection by focusing on "the influence of a field experience based on snake population monitoring on the feelings of schoolchildren" by surveying 520 schoolchildren before and after a field trip involving snakes, and found biophilia toward snakes increased, biophobia decreased, and a willingness to protect snakes increased from 77% to 94% in children who participated in the field experience. Like Ballouard et al., Zhang, Goodale, and Chen (2014) focused on children when they surveyed 1119 children, aged 9-10, from 15 elementary schools in China regarding their contact with nature, biophilia, biophobia, willingness to conserve animals, and general attitudes toward animals, and found that

"Biophilia and biophobia were significantly affected by children's contact with nature" (p. 112).

These three example studies on biophilia conclude that the connection between individuals and nature can be innate but needs to be developed. A strong connection to nature can be developed through environmental programs and safe green spaces in urban areas (White, 2004). While the literature on biophilia is primarily normative, there is a common thread between the normative studies and the selected empirical studies in that future development of environmentally aware individuals requires partnerships between schools and nature organizations. Ballouard et al. (2012) recommended a "balanced role" between "conservationists and educators" (p. 427).

While the three studies briefly presented above, did not use the bioecological model directly, they did explore biophilia from a stratified viewpoint where the individual had to interact with others outside their immediate circle of influence to gain experience with nature. The natural park in Spain and public science center that hosted the field trip are all operated by other agencies that provide in-direct influence on the study participant. Only a handful of studies were found to have discussed the bioecological model to study biophilia, but none have applied it explicitly. This study, however, assumes that biophilia is a natural driver of proenvironmental behavior, and therefore, is also a natural driver of ecological citizenship that can be encouraged through public policy, public environmental opportunities, and family norms and values. The three studies discussed in this section influenced the development of this study through their focus on the willingness of the study participant to engage in some aspect of

environmental behavior. Ballouard et al. (2012) inquired into a willingness to protect a species, Zhang et al. (2014) focused on a willingness to conserve, and Martin-Lopez et al. (2007) asked about the respondent's willingness to pay, which supports the focus on an individual's willingness to take action to conserve the environment in this study.

Methodology and Instrumentation: Proenvironmental Behavior

Like biophilia, proenvironmental behavior is well represented in the literature with close to 20,000 results in Google Scholar for the keyword *proenvironmental behavior* and its variations; however, unlike biophilia research, it has been studied directly using a variety of methodologies and instruments. Literature on proenvironmental behavior has utilized both qualitative and quantitative methods and a variety of theoretical frameworks including the theory of planned behavior, value-belief-norm theory, and the bioecological model. Instruments used to study proenvironmental behavior are also varied; however, proenvironmental behavior studies with an ecological or environmental citizenship focus often utilize the New Ecological Paradigm.

The term *proenvironmental behavior* is very broad and has been operationalized in numerous ways throughout the years. Larson, Stedman, Cooper, and Decker (2015) utilized a mixed-method approach to operationalize proenvironmental behavior. Larson et al.'s (2015) data collected through snowball sampling of 41 rural upstate New York "nature-based recreationists" (p. 115) and a web based and mailed survey of 1027 residents in the same region was "examined using confirmatory factor analysis" (p. 118). Confirmatory factor analysis "is almost always used in the process of scale development to examine the latent structure of a test instrument" (Brown, 2014, p. 3). Brown (2014)

noted that confirmatory factor analysis is used before structural equation models (SEM), which is often used in proenvironmental behavior research. Larson et al. (2015) found proenvironmental behavior to be a "four-dimensional structure" consisting of "conservation lifestyle, land stewardship, social environmentalism, and environmental citizenship" (p. 420). These four dimensions, while measured differently by Larson et al., have been identified as factors of proenvironmental behavior for decades.

Masud, Akhtar, Afroz, Al-Amin, & Kari, F. B. (2015) explored factors relating to proenvironmental behavior in Singapore by surveying 400 residents in the state of Selangor age 18 and over through convenience sampling and found that individuals reporting proenvironmental behavior were significantly influenced through personal attitude toward the environment, awareness of environmental needs, and knowledge of how individual actions affect the environment. Their study concluded that proenvironmental behavior in the region could be improved through increased public policy that aimed to increased individual environmental knowledge and awareness (Masud et al., 2015). These findings are reiterated throughout the literature on proenvironmental behavior regardless of sampling methods, research design, or instrumentation.

Proenvironmental behavior is often approached as the relationship between individuals and nature in terms of action. This action is often studied utilizing the value-belief-norm (VBN) theory of environmentalism. Stern's (2000) VBN theory combined the NEP with the adverse consequences for valued objects and perceived ability to reduce to measure individual environmental belief. Studies often use VBN to explore the

relationship between individual environmental belief and a single proenvironmental behavior, such as recycling electronic waste (Saphores, Ogunseitan, & Shapiro, 2011) and support for increased carbon tax (Harring & Jagers, 2013).

Methodology and Instrumentation: Influence on this Study

A Google Scholar search on ecological citizenship literature published since 2013 revealed 50% of the literature is qualitative in nature, and 50% is mixed methods or quantitative. The NEP guided 58 of the studies and VBN guided 32 studies. When the same search was conducted on proenvironmental behavior, literature published since 2013 is nearly 41% qualitative and 59% quantitative or mixed methods. Within proenvironmental behavior research, NEP accounted for roughly 25% of the studies instrumentation and VBN accounted for 30% of the studies framework or instrumentation. These results support Growneveld et al.'s (2014) findings that qualitative methods are the preferred choice within public policy, but complex relations within the field often utilize a quantitative or mixed method design to better understand the relationship.

No study has been found that directly addresses the role of political agents on the development of ecological citizenship; however, a key study that identified the influence of political agents on the development of ecological citizenship and proenvironmental behavior was conducted by Kollmuss and Agyeman (2002). Kollmuss and Agyeman (2002) reviewed a selection of environmental behavior models, explored individual model strengths and weaknesses, and developed a model that identified barriers to proenvironmental behavior. These identified barriers have guided many studies

presented within this literature review, but a common actor between the barriers has not been explored. Barriers to proenvironmental behavior are: existing knowledge and values, lack of knowledge, lack of incentives, lack of environmental consciousness, and lack of opportunities (Kollmuss & Agyeman, 2002, p. 257). Knowledge, incentive, and opportunities are provided through external means that influence internal values and consciousness.

Building on studies that explored environmental belief and behavior (e.g., Kollmuss & Agyeman, 2002; Middlemiss, 2010; Wolf et al., 2009) and studies that explored environmental action (e.g., Kelly & Able, 2012; Seyfang, 2006; Spaargaren & Oosterveer, 2010), this study fills a gap in understanding how ecological citizenship is developed by combining belief, measured by the NEP, and willingness to take action by focusing on indirect agents of influence. These indirect agents have the power to directly drop the barriers to environmental behavior identified by Kollmuss & Agyeman, which can only serve to increase environmental behavior within the grasslands and promote ecological citizenship within the region. The focus of this study has not been addressed before but has been identified as a need for further study to better understand how ecological citizenship can be developed through indirect methods. Therefore, this quantitative study is necessary to fill this gap in understanding and contribute to the quantitative literature that will increase knowledge on the predictive factors of environmental behavior.

Summary

This chapter traced the development of environmental behavior from the individual level to becoming a national and international agenda. To promote a sustainable community, Dobson (2003) argued that there needed to be a shift in citizenship from liberal and republican to a post-cosmopolitan concept where individuals act in the best interest of global citizens and future generations. To achieve this, Dobson (2003) introduced ecological citizenship where proenvironmental individuals enter political space.

The bioecological model can be used to explore the development of ecological citizenship from biophilia in the person, through proximal processes with family, friends, and nature in the microsystem, to engaging nature as adults through programs offered in the mesosystem by NGOs and agencies in the exosystem. These programs are shaped by, and help shape, communal norms and values found in the macrosystem. This development of an ecological citizen occurs over the individual's lifetime and serves to influence future generations through changing familial norms and values.

The multigenerational changes found in the development of ecological citizenship, and environmentalism in general, is strengthened by the bioecological model. Studies have focused on how individuals develop ecological citizenship from the individual level, but none have focused on the role of entities in the exosystem, political actors and organizations, in the development of ecological citizenship. Once this gap is filled, exosystem entities can increase influence over the development of ecological citizenship through better programs and more aligned rules and regulations.

Chapter 3 presents the research design and rationale for its selection as well as a thorough description of the study's population. Sampling techniques are also presented, as are procedures for how participants will be solicited and selected. The study's instrument will be presented as well how the survey has been previously used to explore proenvironmental behavior and ecological citizenship. Threats to the study and ethical procedures close out the chapter.

Chapter 3: Research Method

Introduction

My purpose in this study was to explore the roles of state legislators and agents, state organization partner directors and staff, and NGO directors and staff in the development of ecological citizenship within Iowa, Kansas, Nebraska, South Dakota, and North Dakota. To accomplish this purpose, I used a quantitative approach to measure current levels of proenvironmental behavior and receptiveness to ecological citizenship, and to determine the relationship between the individual's personal beliefs and professional role.

In this chapter, I introduce the research design and present the rationale for selecting this design, as well as how this design connects to the research questions and study variables. In the next section, I discuss my methodology in the study with a focus on the population, sampling procedures, and recruitment of study participants. I also present the instrument that used in this study and why I selected the willingness to take action and NEP surveys. In the next section, I present threats to the study created through variable selection, instrument selection, and data analysis. I conclude the chapter with a description of ethical procedures that I implemented to protect the integrity of the study and anonymity of the participants.

Research Design and Rationale

Researchers have three general options for designing their studies: qualitative, quantitative, or mixed methods. Empirical studies have often used case study, experimental, correlational, and regression designs to explain or predict the relationship

between individuals and environmental behavior. Qualitative methods, such as case study and phenomenological designs, produce "descriptive data" that focus on understanding individual understanding of the world around the individual (Taylor, Bogdan, & DeVault, 2015), whereas quantitative methods, such as experimental and correlational designs, explore "relationships between variables" (Creswell, 2009, p. 4).

Within public administration, the predominant design is qualitative; however, Groeneveld, Tummers, Bronkhorst, Ashikali, and Theil (2014) found 41% of public administration articles used quantitative methods. Growneveld et al. (2014) also found that distribution of quantitative methods between subfields were not equal. Exploring proenvironmental worldviews and individual willingness to take action within the political system falls under public policy and management categories, which often use quantitative approaches. I considered a variety of designs for this study, but found correlation and linear regression to be the most fitting to adequately address the research questions and add to the body of knowledge on ecological citizenship development.

Case studies cannot be generalized, focus on a single concept approached from different angles, use multiple methods of data collection, and often answer questions of *how* and *why* (Thomas, 2016). Lester and Cottle (2009) used a case study design to "examine the nature of climate change visualization within television news" (p. 921) and found "visual rhetorics of climate change . . . can encourage ecological citizenship" (p. 933). The case study approach would be applicable in this study if the focus were on one single aspect, such as recycling, or one specific organization or location, such as Quivira

National Refuge or Ducks Unlimited; however, that was not my intent in this study, and therefore, the case study design was not applicable.

Experimental studies are quantitative and generalizable and allow the researcher to "assign subjects to different research groups and control who is exposed to the independent variable, when they are exposed to it, and the conditions under which the experiment takes place" (O'Sullivan, Rassell, & Berner, 2008, p. 58). Von Meyer-Höfer, von der Wense, and Spiller (2015) used an experimental design to determine whether food labeling practices influenced sustainable food purchases in Germany. Although the experimental design could be applied to the development of ecological citizenship, a treatment variable, such as a unique program or educational course, would be needed. This study on the development of ecological citizenship does not focus on any single treatment, but rather focuses on a group of individuals that have the power to influence individual environmental behavior through indirect methods and, as such, the experimental design was not applicable to my study.

The correlational design, like experimental designs, is a quantitative approach to explaining the relationship between two or more variables; however, unlike experimental designs, correlational studies cannot predict outcomes based on cause and effect (Creswell, 2009). Martinsson and Lundqvist (2010) explored ecological citizenship through a correlational design to determine whether a relationship existed between shifts in attitude and ecological citizenship, and they concluded that individuals with increased attitudes toward the environment and increased environmental behavior could be considered to exhibit ecological citizenship; however, the findings do not imply that

increased attitudes toward the environment cause or predict ecological citizenship but rather that a relationship exists between the two beliefs. The correlational design serves as the primary design for this study.

Regression studies are like correlational studies in that they both explore relationships between two or more variables independent variables and the dependent variable; however, regression studies examine this relationship one step further to determine if one or more of the independent variables can predict, to some degree, the dependent variable (Creswell, 2009). Jagers et al. (2011) utilized regression analysis to determine "Which aspects of ecological citizenship theory are most important as drivers for pro-environmental behavior" (p. 4) and found that perceptions of "social justice and dismantling the public-private distinction" (p. 22) are significant predictors of proenvironmental behavior when viewed through ecological citizenship principles. Jagers et al. (2011) also noted that additional studies that included a wider variety of independent variables are needed to better understand the factors of ecological citizenship and proenvironmental behavior development. It is for this reason that I selected linear regression as the second method of analysis for this study.

I focus on the indirect, influential relationship between residents of the grasslands and political agents with a focus on the development of ecological citizenship to determine if selected independent variables predict the worldview of the respondent to better understand how that individual perceives their role in the development of ecological citizenship within their states. My research questions directly seek to understand the relationship between state legislators and the development of ecological

citizenship, state organization partners and the development of ecological citizenship, and NGO administrators and the development of ecological citizenship. The following research questions guide this quantitative study:

RQ1: What roles do state legislators and agents perceive that state governments can play in fostering environmental citizenship among residents in their states?

H_o1: There is no significant relationship between state legislator and agents' worldview and willingness to take action.

H_a1: There is a significant relationship between state legislator and agents' worldview and willingness to take action.

RQ2: What roles do state organization partner directors and staff perceive that their partnerships can play in fostering ecological citizenship among residents in their states?

H_o2: There is no significant relationship between state organization partner director and staff's worldview and willingness to take action.

H_a2: There is a significant relationship between state organization partner director and staff's worldview and willingness to take action.

RQ3: What roles do NGO administrators and staff believe their organizations can play in fostering ecological citizenship among residents in their states?

H_o3: There is no significant relationship between NGO director and staff's worldview and willingness to take action.

H_a3: There is a significant relationship between NGO director and staff's worldview and willingness to take action.

Regression studies measure responses to determine which, if any, independent variables predict the dependent variable. This study has one dependent variable, ecological citizenship, and one primary independent variable. The independent variables, both primary and secondary, are: sex, political affiliation, political values, education, race or ethnicity, and environmental worldview. These variables were selected because they highlight each of the subsystems found within the bioecological model. Sex and ethnicity is inherent within the individual, whereas political values, party affiliation, and education are constructed through previous experiences. An individual's worldview is shaped by previous generations and interactions throughout the individual's lifetime. This set of independent variables can serve as benchmarks for each subsystem within the bioecological model to determine which, if any, predict an individual's willingness to take action which is a direct influence on others, thereby completing the circle of influence between generations. How these variables are operationalized and measured will be presented in the next section.

Methodology

Regression designs, like all quantitative designs, rely on a clear definition of the population and application of appropriate sampling techniques to produce results that are generalizable for the entire population. This section outlines the study's population, sampling and sampling procedures, procedures for recruitment, data collection methods, instrumentation and operationalization of constructs, and data analysis plan, such that the study could be replicated within the same parameters or serve as a guide for other populations.

Population

Quantitative research aims to produce results that are generalizable to the full population but must first define that population explicitly (O'Sullivan et al., 2008). The population for this study are all state legislators and agents, all state organization partners identified in each state's wildlife action plan, and all environmental NGO directors and staff. This population is far too large and must be reduced to a target, or study, population. The target population for this study is: state legislators and agents, state organization partner directors and staff, and environmental NGO directors and staff living and working in Kansas, Nebraska, Iowa, North Dakota, and South Dakota in 2017. These three groups represent entities within the exosystem that have the power to influence individual development of ecological citizenship through indirect means, such as public policies and program development (Bronfenbrenner & Ceci, 1994; Dobson, 2003). Each group has a set of clearly identifiable individuals derived from state and organizational websites, and state produced publications. This allowed for identification of acceptable population estimates for each group to determine the appropriate study sample size.

According to the National Convention on State Legislatures (2017), the aggregate state senate is 40.2% Democrat, 57% Republican, and 2.8% Other, and the aggregate state house of representatives is 43% Democrat, 56.4% Republican, and 0.6% Other. For this study's population, the aggregate state senate is 20% Democrat, 57.4% Republican, and 22.6% Other, and the aggregate state house of representatives is 26.7% Democrat and 73.3% Republican. The 22.6% Other identified within the aggregate state senate is

because Nebraska has a nonpartisan, unicameral legislative branch. There is a total of 608 state legislators in this group's target population (Table 2).

Table 2

Political Affiliation Within the Region

	State Legislature			State House of Representatives		
State	Democrat	Republican	Other	Democrat	Republican	Other
KS	9	31		40	86	
ND	9	38		13	81	
SD	6	26		10	60	
IA	20	29	1	41	59	
NE			49			
Total	44	124	50	104	286	

The population for state organization partnerships was derived through the state wildlife action plan for each selected state. To determine the target population size for each identified organization, a search of the organization's website and institutional material was conducted to identify board members, directors, and regional staff. Some states included educational facilities, federal agencies, and national organizations as state partners, but these were excluded from this group's population because of the scope and limitations of this study. The total number of individuals identified for this group's target population is 795 individuals from 65 organizations (Table 3).

Table 3

State Organization Partnership Population by State

State	Number of selected state organization partnerships	Total number of identified individuals for population
KS	26	312
ND	10	64
SD	8	168
IA	6	146
NE	15	105
Total	65	795

The last group in this study are environmental NGO directors and staff. This is the largest of the three groups and is not identified within the state wildlife action plans. Members of this group were identified through a variety of methods including identifying local chapters of national environmental organizations, surveying state websites to identify programs managed by local environmental organizations, using Google to locate environmental and conservation organizations within the state, and to examine organizational website to locate related and partner organizations within the state (Table 4). Each state has an association of conservation districts which constitutes the largest individual entity within this group. This group of organizations is still within the exosystem along with state organization partners and state legislators and agents but has a more direct relationship with a wider portion of the community than the other entities. Care was taken to identify only those positions, such as director and board members, that would have less direct interaction with the community than other positions, such as volunteer coordinator or youth activity instructor. Organizations selected for this study were chosen because they operate state-wide, provide membership or volunteer

opportunities for interested individuals, and focus on ecological citizenship principles including reducing ecological footprints, sustainable development, and sustainable consumption. The total number of identified individuals within this group is 3,195.

Table 4

Selected NGO Population by State

State	Number of selected environmental NGOs	Total number of identified individuals for population
KS	15	762
ND	12	579
SD	16	583
IA	14	647
NE	10	624
Total	67	3195

The total identified population for this study is 4,276. There is a hidden population within each group that consists of aides, organizational staff members, and others known to the respondent within the same group, but not identified in the population survey. The next section outlines the sampling and sampling procedures taken to achieve the desired sample size.

Sampling and Sampling Procedures

In this study, I utilized two sampling techniques: simple random sampling and snowball sampling. Simple random sampling technique is used when the population size is known, and each member of the population has an equal chance of being included in the study (O'Sullivan, Rassel, & Berner, 2016). For this study, the primary participants are known and easily identifiable due to their positions as lawmakers, agency directors, and NGO administrators. The second sampling technique, snowball sampling, is used

when other participants that are not easily identifiable by the researcher, but would be accessible by the participant (Goodman, 1961). The online survey will be advertised to primary participants along with a request to distribute to staff members. This technique will allow for a maximum number of participants within the desired population.

A power analysis using G*Power was conducted to determine the desired sample size. A power analysis requires three decisions by the researcher: power, significance level, and effect size. The power of the study refers to the probability of rejecting a false null hypothesis, or Type II error (Cohen, 1992). As noted by Cohen (1992), a power of .80 is enough to neither increase the risk of error nor increase the study's resources. Significance level, or alpha, is the risk of falsely rejecting a null hypothesis, or Type I error, and is often set at .05 (Cohen, 1992). The last decision in determining a sample size is the effect size. The effect size can be small (r = .05), medium (r = .15), or large (r = .25) and refers to the strength of the relationship between the variables (Cohen, 1992). For this study, a power of .80, medium effect size (r = .15), a significance level of .05, and five predictors, or independent variables, was used in G*Power to determine the recommended sample size of 92. Response rates for survey studies often range between 10% and 30% (e.g., Poortinga, Steg, & Vlek, 2004). In quantitative studies with multiple populations, such as this study, the sample size must be larger than recommended (O'Sullivan et al., 2016). To determine the desired sample size for this study, the G*Power recommended sample size was multiplied by three to account for the three population groups, then divided by 30% to account for the low expected participation

rate. In this way, the sample size is 920 and will meet the minimum recommended G*Power sample size if participation rates are low.

Simple random sampling technique is used when the population size is known and each member of the population has an equal chance of being included in the study (O'Sullivan et al., 2016). For this study, the primary participants are known and easily identifiable due to their positions as lawmakers, agency directors, and NGO administrators. The second sampling technique, snowball sampling, is used when other participants that are not easily identifiable by the researcher, but would be accessible by the participant (Goodman, 1961). As presented earlier, there are unidentified possible participants who are staff members and directors of other, equivalent organizations. The next section presents the procedures for recruitment, participation, and data collection.

Procedures for Recruitment, Participation, and Data Collection

Recruitment, participation, and all data collection were conducted electronically. Identified individuals that are selected in the random sampling will be contacted by email and informed of the opportunity to participate in the study. This initial contact email will include a link to the survey and a request to forward the email to others that fit the description of the study participant. Contacted individuals have the option to participate or not participate. The survey will be delivered online through SurveyMonkey and the only identifying information that will be collected is the group to which the participant belongs: state government, partnering organization, or non-partnering organization. Organizations listed in the state wildlife action plans will be identified to make selection of group easier. Using an electronic delivery method will allow disclosure, consent, and

exit procedures to be incorporated into one survey package. A follow up email will be sent 15 days after initial email. The following section describes the instrument used in the survey, as well as how the instrument questions relate to the research questions and hypotheses.

Instrumentation and Operationalization of Constructs

This study will integrate two instruments. The first instrument, Dunlap et al.'s New Ecological Paradigm (NEP) scale, was revised in 2000 and measures environmental concern through 15 statements. These statements measure endorsement of the dominate social paradigm or the new environmental paradigm, which is closely related to ecological citizenship (Dunlap et al., 2000). Questions in this scale are ordinal and utilize a 5-point Likert scale that ranges from *Strongly Disagree* to *Strongly Agree*. Permission to use this instrument is freely given by the author and does not have an associated fee. The NEP scale has been used extensively to measure environmental attitudes in a variety of studies including international contexts (e.g., Fleury-Bahi, Marcouyeux, Renard, & Roussiau, 2015; Ogunbode, 2013; Xue & Zhao, 2015), consumer behavior studies (e.g., Kumar & Ghodeswar, 2015; Polonsky, Vocino, Grimmer, & Miles, 2016; Sudbury-Riley, Hofmeister-Toth, & Kohlbacher, 2014), environmental education (e.g., Atav, Altunoğlu, & Sönmez, 2015; Kuo & Jackson, 2015; Spinola, 2015), and in conjunction with the value-belief-norm theory and survey (e.g., Angeles, 2015; van Riper & Kyle, 2014).

The second instrument, willingness to take action, was created by Sinatra, Kardash, Taasoobshirazi, and Lombardi in 2012. This questionnaire explores willingness to take action regarding global warming, but the questions are applicable to reducing

one's ecological footprint as required by Dobson. This questionnaire is available for educational purposes without requiring permission to use as long as the authors are properly cited and is available without a fee. The questions from this instrument are also ordinal and use a 4-point Likert scale ranging from *Not Willing at All* to *Willing Enough to Convince Others*. As is common with environmental and ecological behavioral studies, this questionnaire is often combined with other surveys and questionnaires to meet the needs of the researcher. Sinatra et al. (2012) combined multiple instruments and reported the willingness to take action questionnaire's reliability was $\alpha = .85$ in their study of 140 college students; while Schoenefeld and McCauley's (2015) study reported a willingness to take action reliability of $\alpha = .97$.

I combined these two instruments to create a survey that traces the development of ecological citizenship from individual worldview to promoting ecological citizenship in others (Appendix A). Each of the questions on the survey directly measure or relate to an aspect of ecological citizenship as it could be developed using the bioecological model. Demographic information including age and sex are directly related to the individual system that all other systems are constructed from. The 15 questions derived from the NEP directly relate to the respondent's worldview, and the 12 questions from the willingness to take action measure the respondent's willingness to promote ecological citizenship in others. The literature review outlined two thoughts, anthropocentrism and biocentrism, and two actions, sustainable consumption and sustainable development, that shape ecological citizenship. The three research questions inquire into whether thought can predict action, and if so, does that thought need to be significant before an individual

takes action. Each question on the survey relates to one of these four areas that shape ecological citizenship (Table 5).

Table 5

Relationship Between Instruments and Ecological Citizenship

Factor of ecological citizenship	Dunlap's NEP (2000)	Sinatra's WTTA (2012)
Anthropocentrism	1,3,5,7,9,11,13	
Biocentrism/moral obligation	2,4,6,8,10,12,14	
Sustainable consumption		1,3,5,6,7,8,10,12
Sustainable development		2,4,9,11

Operationalization of a variable describes how that variable is defined, and how it will be measured. Operationalization of variables can also help connect the research question, hypothesis, and instrument. This study has a total of six variables that are operationalized as follows:

- Ecological citizenship, the dependent variable, is an ordinal variable that utilizes the willingness to take action scale to determine how willing the respondent is to convince others to act environmentally and reduce their ecological footprint.
- Worldview, an ordinal independent variable, is determined by responses on the NEP. Positive responses to the seven even questions, and negative responses to the eight odd questions determine an individual's endorsement of the new ecological paradigm, or a new environmentally friendly worldview.
- Group, a nominal independent variable, allows the individual to identify which exosystem group the respondent is currently employed through a single question on the survey.

- Political affiliation is a nominal independent variable measured by one survey question that allows the respondent to identify if they are Democrat, Republican, or a third party.
- *Sex*, the last independent variable, is a dichotomous measurement of the respondent's sex.

Data Analysis Plan

Data collected from the surveys will be analyzed using SPSS. After collecting the survey data from SurveyMonkey, the data can be screened, cleaned, and prepared for SPSS analysis. The data will first be checked for missing data or duplicate cases. If there are duplicate cases, the duplicate will be removed. Descriptive analysis of the data will help determine if any cases with missing data affect the study. Preparing the data for analysis includes coding the dichotomous variable Sex (0 = male, 1 = female), nominal variable Political Affiliation (0 = Republican, 1 = Democrat, 2 = Other, and 3 = No Answer), and nominal variable Environmental Activity (0 = No Participation, 1 = 1 Activity, 2 = 2 Activities, and 3 = 3 Activities). The variables Worldview and Willingness to Take Action do not need recoding.

The data collected in this study tests hypotheses related to three questions:

- What roles do state legislators and agents perceive that state governments can play in fostering ecological citizenship among residents in their states?
- What roles do state organization partner directors and staff perceive that their partnerships can play in fostering ecological citizenship among residents in their states?

- What roles do NGO administrators and staff feel their organizations can play in fostering ecological citizenship among residents in their states?

The correlational study tests the hypothesis that there is a significant relationship between the respondent's worldview and their willingness to take action. By exploring this relationship further, I can add to the literature on factors predicting ecological citizenship within the U.S. grasslands by conducting regression testing.

Threats to Validity

Threats to external validity are factors that affect the generality of the study, while threats to internal validity challenge the correlation and causation results of the study (O'Sullivan et al., 2016). Many threats to internal validity, such as maturation and history, do not exist in this study due to the one-time survey with no pre-test or post-test. The primary threat to internal validity is caused by the sampling method. While the main sampling method is simple random sampling where each member of the target population has an equal chance to be included in the study, the secondary snowball sampling method introduces self-selection bias into the study as staff members opt to participate or not participate in the study. Some participants found through snowballing may feel obligated to participate in the study.

Threats to external validity in this study are lower than threats to internal validity. Due to the nature of the study, only one group, state legislators, is not in an environmental position, which implies the sample will be very representative of the study's population. Generalization to the region's entire population, however, is limited,

but the results would be generalizable to environmental leaders and staff within other regions of the United States.

Ethical Procedures

For this study I utilize a quantitative survey delivered online with three follow-up emails to remind potential participants about the study. The Walden Institutional Review Board application was completed following successfully defending this proposal as required by Walden University. Participants will be approached through e-mail and all communication will be through online methods which will allow for easier access to participants and not require access or personal interaction. There are few ethical concerns expected in regard to recruitment. Data collection will take place online which will protect anonymity of the participant with the only identifier being their categorical employment response. Data will be retrieved from the online survey and stored in an encrypted file locally and in password protected cloud storage for five years. No one will have access to the data and after five years the data will be destroyed by deleting the cloud storage and file.

Summary

In this chapter, I presented the study's purpose, to better understand the role of political agents in the development of ecological citizenship, and research questions that will be used to serve that purpose. To accomplish this purpose, I will conduct a correlation and regression study to explore the relationship between the worldview and ecological citizenship. Dunlap's NEP has been extensively used to measure environmental concern and, along with Sinatra's WTTA questionnaire, will serve as the

basis for this study. Online surveys, and non-experimental studies, have fewer threats to validity and what threats remain are easily addressed through statistical analysis methods. Walden University provides explicit instructions on how to obtain permission to begin the study, and these will be followed after successfully defending this study proposal. In Chapter 4, I present the data results of the study and Chapter 5 presents the results in context of the bioecological model and how further research is necessary to fully understand the role of the political system in the development and fostering of ecological citizenship.

Chapter 4: Results

Introduction

My purpose in this quantitative study was to explore the perceived roles of state legislators and agents, state organization partner directors and staff, and NGO administrators and staff in the fostering of ecological citizenship within Iowa, Kansas, Nebraska, South Dakota, and North Dakota. I selected these states for this study because their borders lie solely within the U.S. grasslands. This region is more than 95% privately owned, which makes understanding how public entities perceive their roles in the development and fostering of ecological citizenship within their states imperative to the environmental health of the region. Ecological citizens bridge the gap between private action and public policy through individual environmental behavior, encouraging environmental behavior in others, and participation in public policy processes including the development of state wildlife action plans, citizen science programs, and state-based environmental behavior programs.

In Chapter 2, I presented an extensive review of the literature and found that much is known about how direct interaction between individuals can aid the development of ecological citizenship (e.g., Russ et al., 2015; Shapiro et al., 2016; Steg, 2016); however, many scholars noted the need to better understand how agents of indirect influence aid in the development and fostering of ecological citizenship (e.g., Lummis et al., 2016; Islar, 2016; Scoville, 2016). I developed three research questions and hypotheses to better understand how agents of indirect influence view their roles on the development and fostering of ecological citizenship within their states:

RQ1: What roles do state legislators and agents perceive that state governments can play in fostering ecological citizenship among residents in their states?

H_o1: There is no significant relationship between state legislator and agents' worldview and willingness to take action.

H_a1: There is a significant relationship between state legislator and agents' worldview and willingness to take action.

RQ2: What roles do state organization partner directors and staff perceive that their partnerships can play in fostering ecological citizenship among residents in their states?

H_o2: There is no significant relationship between state organization partner director and staff's worldview and willingness to take action.

H_a2: There is a significant relationship between state organization partner director and staff's worldview and willingness to take action.

RQ3: What role do NGO administrators and staff believe their organizations can play in fostering ecological citizenship among residents in their states?

H_o3: There is no significant relationship between NGO director and staff's worldview and willingness to take action.

H_a3: There is a significant relationship between NGO director and staff's worldview and willingness to take action.

I conducted an online study between August 20, 2017, and October 1, 2017, to explore these research questions and test the hypotheses. In Chapter 4, I present the results of this study beginning with a brief description of how I conducted the study, and

whether I made any deviations from the proposed plan that I presented in Chapter 3. In the second section of this chapter, I report descriptive statistics of the participants and how each variable relates to both their environmental worldview view and their willingness to take action to help the environment. In the third section, I report the results of hypothesis testing and briefly places those results in context of the current literature. I conclude Chapter 4 with a summary of key results and how those results relate to what is known about ecological citizenship.

Data Collection

I did not conduct a pilot study because the NEP scale has been widely used in environmental behavior research since 2000 when Dunlap expanded the original NEP scale to 15 Likert-scaled items. Atav et al. (2015) used the NEP to determine environmental attitudes of students in Turkey and found that the students were eco-conscious, but they also noted that the NEP was culturally dependent. Jagers and Matti (2010) also used the NEP scale to determine environmental attitude in Sweden, but they found that environmental attitude, if it is to be considered ecological citizenship, is nonterritorial. Both studies reverse scored items on the NEP to create a less positive environmental worldview to more positive environmental worldview scale. A less positive environmental worldview is an endorsement of the dominant ecological paradigm, and a more positive environmental worldview is an endorsement of the new ecological paradigm.

My study consisted of three distinct groups: state legislators and agents, state partnership directors and staff, and environmental NGO administrators and staff. I

identified state legislators through their respective state's legislature website where the individual's name and email address or phone number was published online. I used the state SWAP to identify formal state partners then used Google to locate the organization or agency's website where I found contact information for staff and board members. The last group, NGOs, proved more difficult to identify, but through mining the websites of state partners, national organizational websites, and 501(c)(3) search engines, I compiled a list of administrators, staff, and board members to invite to participate in the study.

I submitted my application to conduct the study to Walden University's institutional review board (IRB) on July 17, 2017 and received final approval to begin collecting data on August 8, 2017 (Walden University IRB approval number 08-08-17-0598391). Between August 8, 2017, and August 20, 2017, I formalized the population list of 3,821 names and contact information. I then separated the population list was by group and I assigned everyone a randomly generated number. I then sorted each group was by the random number and I selected the first 600 names of each group for the study's sample.

I contacted everyone on the sample list via email or phone on August 20, 2017, and August 21, 2017. If the email was undeliverable, or the phone number was not current, then I removed that individual from the sample list and I replaced the name with the next name on that group's list until a total of 600 individuals for each group could be invited to participate in the study. I replaced a total of 37 (2%) individuals during the initial invitation process. Depending on type of initial contact, I conducted follow-up emails or phone calls on September 3 and 4, as well as September 17 and 18, and sent a

final email on September 27, 2017 that thanked participants for their time and provided a website address where the results will be available.

Deviation From Planned Data Collection

In Chapter 3, I presented the anticipated data collection plan; however, two deviations were made during the study. First, SurveyMonkey was not used to deliver the invitation and follow-up email. After consulting my dissertation committee and considering the possibility that the SurveyMonkey email may be blocked through organizational spam filtering, I chose to use my official Walden University email account to deliver the invitation and follow-up emails. This option also allowed me to individualize each email with the individual's name, organization, and include a link to the survey. The second deviation to the anticipated plan was the exclusion of the request to forward the survey invitation to others in their organization or agency. Walden IRB rejected this anticipated method of snowball sampling, so I relied on opening a discussion with those who requested more information and/or was contacted over the phone to obtain another individual's contact information that may qualify or want to participate in the study. Only five individuals were found using this method and all were in Group 3. No further deviations from the anticipated data collection plan were made, and the revised plan was carried out between August 20, 2017 and October 1, 2017.

Participation, Data Cleaning, and Final Response Rates

I closed the survey with SurveyMonkey on October 1, 2017 and downloaded the data in Excel format. Once the data were downloaded, I deleted the survey from SurveyMonkey and the loaded raw data onto a flash drive for safe keeping. The raw data

file does not contain any identifying information and I placed the data in a password protected file. In addition to the raw data, the flash drive also contains the population and sample list in a password protected file. These files will remain on the flash drive in addition to the final data folder and analyzed data files, both in password protected format, for five years as required by Walden University.

The survey administered through SurveyMonkey for each group consisted of the same 13 questions (Appendix A). The first question was informed consent and only those who selected yes were permitted to participate in the study. Three questions were Likert-scaled and contained NEP, WTTA, and factors of ecological citizenship items. Three questions were open-ended questions that are quantified by the yes/no/I don't know response provided by the respondent. The remaining six questions were demographic questions that allowed further analysis and interpretation of the survey.

Of the 1800 individuals invited to participate, 31 (2%) declined after the initial contact. Most individuals who declined to participate in the study did not provide a reason for declining; however, several state legislators did provide reasons ranging from a desire to help their constituents only to a perceived difference in political views based on the study's subject. After the initial email, 21 (1%) potential participants requested additional information on the nature of the study, how the study applied to their organization, and seeking assurance that their responses would be anonymous. Communication from potential participants declined after the initial invitation and the final follow-up yielded no communication.

A total of 814 individuals (45%) participated in the study to some degree; however, not all participants remained in the final study. Ninety-two respondents (11%) failed to complete any question or item past the informed consent, and 34 respondents (4%) completed question 2, the NEP, but failed to complete question 3, the WTTA, thereby leaving the survey without minimally complete data. These 126 respondents (15%) were removed from the final data set. Upon running a basic analysis of the data, six respondents (1%) were also removed on the basis that too many items were missing from Questions 2 and 3 to produce a valid individual response, thereby leaving 682 (38%) respondents in the final study.

If any of the 682 remaining respondents failed to respond to any item on Questions 2 or 4, had the cell filled with a four indicating they did not agree or disagree. None of the remaining respondents had missing items in Question 3. I assigned nonresponsive answers to non-Likert scaled data a 0 for no response. I utilized SPSS' options to mark no response entries as missing data. The three open-ended questions had the highest rates of missing data, but these questions serve to better understand exploratory questions and do not directly affect the outcome of the analysis. There are five variables that had missing data and may affect data analysis: age (n = 8), race or ethnicity (n = 12), level of education (n = 16), political party affiliation (n = 26), and political values (n = 21). I entered all individual items into SPSS as separate variables; however, some individual items were combined to make the variables used in this study (Table 6).

Table 6

Definition and Derivation of Study Variables

Variable	Derivation	Definition
NEP	Question 2	Environmental worldview
WTTA	Question 3	Willingness to engage in ecological behavior
Citizenship	Question 4	Views on ecological citizenship key themes
Access	Question 5	Perceptions on equal access to natural resources
Participation	Question 6	Perceptions on promotion of public participation
Opportunities	Question 7	Perceptions of amount of participation opportunities
Group	SurveyMonkey	Respondent's group based on invitation code
State	SurveyMonkey	Respondent's state
Sex	Question 9	Respondent's sex
Age	Question 8	Respondent's age
Ethnicity	Question 10	Respondent's self-identified race or ethnicity
Education	Question 11	Highest level of school completed by the respondent
Party	Question 12	Respondent's self-identified political party
Values	Question 13	Respondent's self-identified political values

The response rates varied within each group. State legislators and agents had the lowest response rate (19%); however, at the time the survey was conducted three of the states included in the study were not in session and many potential legislative participants responded with an automatic response stating they were not in session and do not check their email regularly. State partnership directors and staff had the highest response rate (55%), and NGO administrators and staff had a 40% response rate (Table 7).

Table 7

Summary of Invitation and Participation Based on State and Group

	Group 1			Group 2			Group 3			Total *n*
	I	P	%	I	P	%	I	P	%	
Iowa	147	22	15.0	149	80	53.7	155	49	31.6	151
Kansas	162	33	20.4	214	120	56.1	47	23	48.9	176
Nebraska	49	13	26.5	200	97	48.5	53	25	47.2	135
North Dakota	140	25	17.9	26	21	80.8	272	95	34.9	141
South Dakota	102	24	23.5	11	10	90.9	73	45	61.6	79
Total	600	117	19.5	600	328	54.7	600	237	39.5	682

Note. I = invited, P = participated after data cleaning.

Descriptive Statistics

In this section, I report the results of descriptive analyses on key variables from both the sample and group perspective. The general results show that respondents have concern for the environment, are willing to engage in some forms of ecological behavior, and that ecological citizenship is present within the sample.

Environmental Worldview

The NEP measures the respondent's endorsement of a "pro-ecological worldview" (Anderson, 2012, p. 260), and serves as this study's independent variable. The *NEP* utilizes a 7-point Likert scale ranging from 1 for Strongly Disagree to 7 for Strongly Agree with a 4 being Neither Agree or Disagree. When a respondent disagrees with the eight odd items it means they endorse the dominant social paradigm, and when they disagree with the seven even items it means they endorse the new ecological paradigm (Table 8). Dunlap et al. (2000) noted, "The decision to break the NEP items into two or more dimensions should depend upon the results of the individual study" and that "if the entire set of items (or at least a majority of them) are found to produce an

internally consistent measure, then we recommend treating the NEP Scale as a single variable" (p. 431). The results of a Cronbach alpha test on question 2, $\alpha = .90$, indicated that no two items were significantly correlated, and that internal consistency could be improved to $\alpha = .91$ with the removal of item 14. Because of the reliability test, the *NEP* will be considered as a single independent interval variable that measures the respondent's environmental worldview.

Table 8

Percentage and Mean Distribution of NEP Items

Item – Do you agree or disagree:	SD	D	SWD	N	SWA	A	SA	*M*
We are approaching the limit of the number of people the earth can support	7.0	14.2	6.9	11.1	26.7	20.4	13.6	4.52
Humans have the right to modify the natural environment to suit their needs	5.3	14.8	21.8	10.4	29.2	14.5	4.0	3.97
When humans interfere with nature it often produces disastrous consequences	2.3	6.3	11.0	12.8	27.4	26.2	13.9	4.91
Human ingenuity will insure that we do NOT make the earth unlivable	5.9	19.1	21.8	15.1	24.5	10.3	3.4	4.22
Humans are severely abusing the environment	5.6	5.9	12.0	6.5	21.3	24.0	24.8	5.03
The Earth has plenty of natural resources if we just learn how to develop them	7.0	15.7	14.7	13.0	24.9	17.2	7.5	3.85
Plants and animals have as much right as humans to exist	6.6	7.6	6.7	13.6	11.6	32.0	21.8	4.99

Item – Do you agree or disagree:	SD	D	SWD	N	SWA	A	SA	M
Despite our special abilities humans are still subject to the laws of nature	0.3	0.7	0.6	3.2	16.6	43.0	35.6	6.06
The so-called "ecological crisis" facing humankind has been greatly exaggerated	25.4	24.6	15.4	10.9	10.9	8.1	4.8	4.99
The earth is like a spaceship with very limited room and resources	5.3	7.8	11.6	15.7	24.9	22.6	12.2	4.64
Humans were meant to rule over the rest of nature	21.0	20.7	11.0	16.9	12.6	10.4	7.5	4.59
The balance of nature is very delicate and easily upset	1.3	6.0	18.3	14.7	23.5	26.1	10.1	4.72
Humans will eventually learn enough about how nature works to be able to control it	18.8	35.8	22.3	11.6	8.7	2.9	0.0	5.36
If things continue on their present course, we will soon experience a major ecological catastrophe	6.0	7.8	9.1	15.4	21.0	22.0	18.8	4.79

Note. SD = strongly disagree, SWD = somewhat disagree, D = disagree, N = neither agree nor disagree, SWA = somewhat agree, A = agree, SA = strongly agree.

Overall, the respondents have a moderate environmental worldview (M = 60.48, SD = 18.993), and neither the minimum nor maximum score was reported. The moderate environmental worldview shared by all three groups creates a working environment between the three groups that could be receptive to new environmental policies and programs; however, respondents in Group 2 and Group 3 reported a more pro-ecological worldview than Group 1 (Table 9). The variation in worldview may be attributable to the

nature of the group and their role in the development and fostering of ecological citizenship within their states. State legislators are the most removed from directly influencing the environmental behavior within their states, while many respondents in Group 2 and 3 works directly with groups or agencies responsible for directly providing opportunities for environmental engagement.

Table 9

Average NEP Scores Based on Group

				95% Confidence Interval	
	n	*M*	*SD*	Lower	Upper
Group 1	117	60.48	18.993	57.00	63.96
Group 2	328	74.06	13.915	72.55	75.58
Group 3	237	74.09	15.236	72.14	76.04
Total	682	71.74	16.161	70.53	72.96

Willingness to Take Action

The five items used in this study from the original *WTTA* scale keep the 4-point Likert scaling ranging from Not at All Willing to Willing Enough to Convince Others and specifically addressed views on sustainable development and sustainable consumption, which are two key factors of ecological citizenship. One item, item 6, was added to Question 3 that specifically addressed the environmental needs of the grasslands utilizing the 4-point scaling options. Like with the *NEP*, results of reliability testing on Question 3, $\alpha = .82$, indicated that no two items were significantly correlated, and that internal consistency could not be improved with the removal of any item (Table 10). The respondent's willingness to engage in environmental behavior will be discussed in terms of categorical analysis to gain a deeper understanding of the differences in sustainable

consumption and sustainable development views based on other characteristics; however, as the internal consistency is acceptable, and the *WTTA* is viewed as a continuous scale of the respondent's willingness to engage in selected environmental behaviors, it will be treated as a single continuous variable for hypothesis testing.

Table 10

Percentage and Mean Distribution of WTTA

Item: How willing are you to do the following:	NW	SW	TW	WCO	*M*
I'm willing to use stop using plastic grocery bags and use recycled bags instead	4.5	22.6	43.8	29.0	2.97
I'm willing to stop buying bottled water because the manufacturing process for plastic water bottles is carbon intensive	8.7	30.2	34.3	26.8	2.79
I'd be willing to carpool	13.9	36.2	35.2	14.7	2.51
I'm willing to pay a .50 cents surcharge per gallon of gas to go toward greenhouse gas reduction	39.7	27.9	21.8	10.6	2.03
I'm willing to reduce the numbers of hours a week I use electronic devices (computer, cell phone, TV, etc.)	18.9	41.6	32.8	6.6	2.27
I'm willing to plant native plants in order to improve the environmental health of the U.S. grasslands	3.7	12.5	32.3	51.6	3.32

Note. NW = Not at all willing, SW = somewhat willing, TW = totally willing, WCO = willing enough to convince others.

The respondents are generally willing to engage in environmental behavior when there is minimal personal impact. Over 95% of respondents are willing to plant native plants, but 40% of respondents are not willing to pay a .50 cent surcharge on gas even though both actions improve the air quality in the grasslands. Respondents are less likely to stop buying bottled water than to use recycled bags at the grocery store even though

both actions reduce the amount of plastic in landfills. The reason for these differences between different environmental behaviors is not a factor of my study, but as Sinatra et al. (2012) found, an individual's attitude toward environmental need is a distinct driver of their willingness to engage in environmental behavior. The same general willingness to engage in environmental behavior was not found in each group.

Respondents in Group 1 have the largest proportion of individuals reporting that they are not willing to use reusable bags at the grocery store (n = 24), will continue buying bottled water (n = 34), are not willing to carpool (n = 39), and are not willing to plant native plants (n = 18). Over half of the respondents in Group 1 (n = 60) reported that they are not willing at all to pay a gas surcharge which could have a direct impact on the grassland's environmental health as Group 1 approves state taxation programs. Respondents in Group 2 (32%) and Group 3 (45%) shared a similar unwillingness to pay an additional surcharge on gas; however, they also reported a higher proportion of respondents who would be willing enough to convince others to pay a surcharge than Group 1 (6% in Group 2 and 3% in Group 3), which implies that an individual's attitude has a greater influence on their willingness to engage in environmental behavior than their group in this study (Table 11).

Table 11

Percentage Distribution of WTTA Items by Group

	NW	SW	TW	WCO
Group 1				
Use recycled bags	20.5	30.8	23.9	24.8
Stop buying bottled water	29.1	36.8	17.1	17.1
Carpool	33.3	29.1	29.1	8.5
Pay a gas surcharge	51.3	13.7	25.6	9.4

Reduce electronic device usage	38.5	33.3	26.5	1.7
Plant native plants	15.4	27.4	29.9	27.4
Group 2				
Use recycled bags	1.8	19.2	49.7	29.3
Stop buying bottled water	3.7	29.9	38.4	28.0
Carpool	8.5	43.6	30.8	17.1
Pay a gas surcharge	32.0	37.8	17.7	12.5
Reduce electronic device usage	15.9	39.6	36.6	7.9
Plant native plants	0.9	7.9	33.2	57.9
Group 3				
Use recycled bags	0.4	23.2	45.6	30.8
Stop buying bottled water	5.5	27.4	37.1	30.0
Carpool	11.8	29.5	44.3	14.3
Pay a gas surcharge	44.7	21.1	25.7	8.4
Reduce electronic device usage	13.5	48.5	30.8	7.2
Plant native plants	1.7	11.4	32.1	54.9

Note. NW = Not at all willing, SW = somewhat willing, TW = totally willing, WCO = willing enough to convince others.

Respondent's Demographics

The respondents in this study were 60% male (n = 408) and 40% female (n = 274), which is statistically different than the U.S. Census Bureau reported distribution in the region. Group 1, state legislators and agents, is historically predominately male, which partially explains the skewness of the data. In general, women (M = 76.45, SD = 12.975) reported a more pro-ecological worldview than men (M = 68.58, SD = 17.295), which was expected due to the nature of ecological citizenship. Men were least likely to engage in any environmental activity included in this study (2%); however, men were more willing than women to convince others to pay a gas surcharge (11%). Women were more willing to convince others to engage in personal environmental activities such as reducing electronic usage (56%) and using recycled bags at the grocery store (62%). The differences in willingness to engage in pro-ecological behavior between men and women

may be the byproduct of gender roles rather than personal environmental attitude (Figure 6).

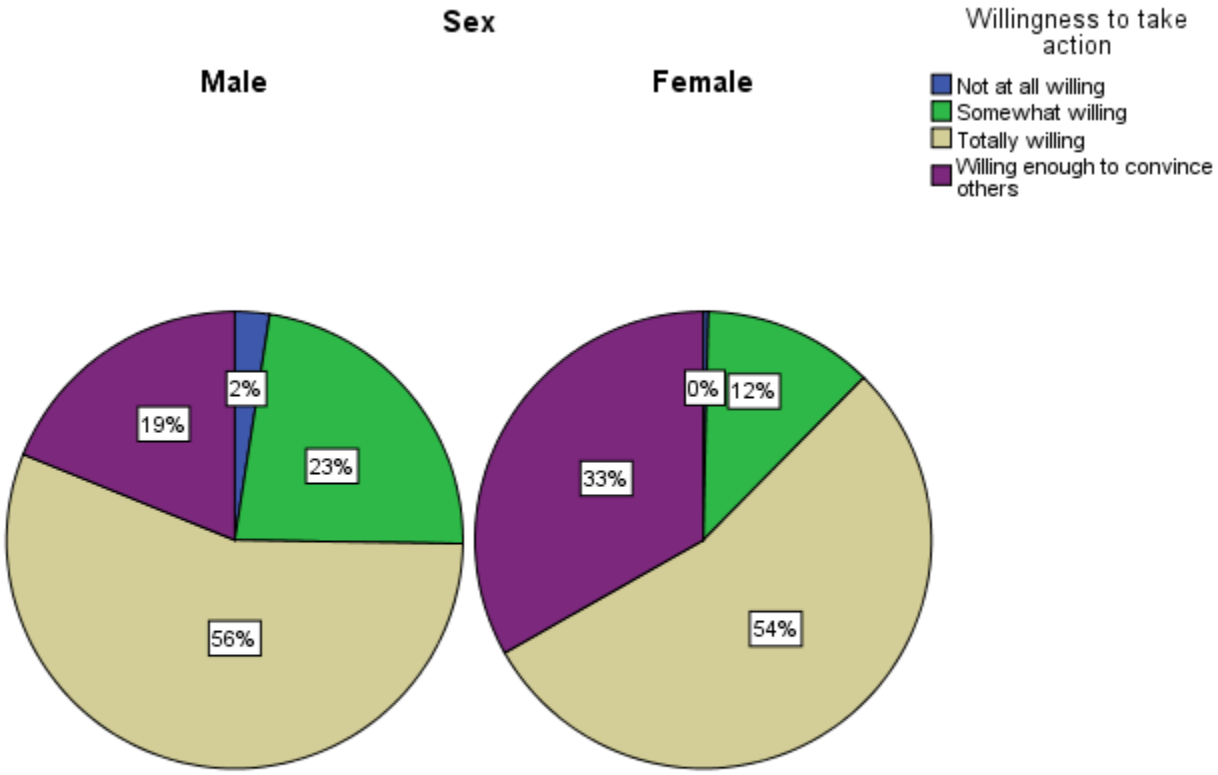

Figure 6. Distribution of WTTA by respondent's *sex*.

The respondents range in age from 18 to over 60; however, eight respondents (1%) declined to provide this information for the study. Over 80% of the respondents (*n* = 607) were age 30 or older, which was not unexpected given the nature of the study, but 31% of the respondents (*n* = 209) were over 60, which was unexpected given the focus of the study. The environmental worldview is generally positive for each age group with

the least pro-ecological worldview being reported within the 18 to 20 age group (*M* = 67.00, *SD* = 0.000), and the most pro-ecological worldview being reported within the 21 to 29 age group (*M* = 75.08, *SD* = 13.888) (Figure 7).

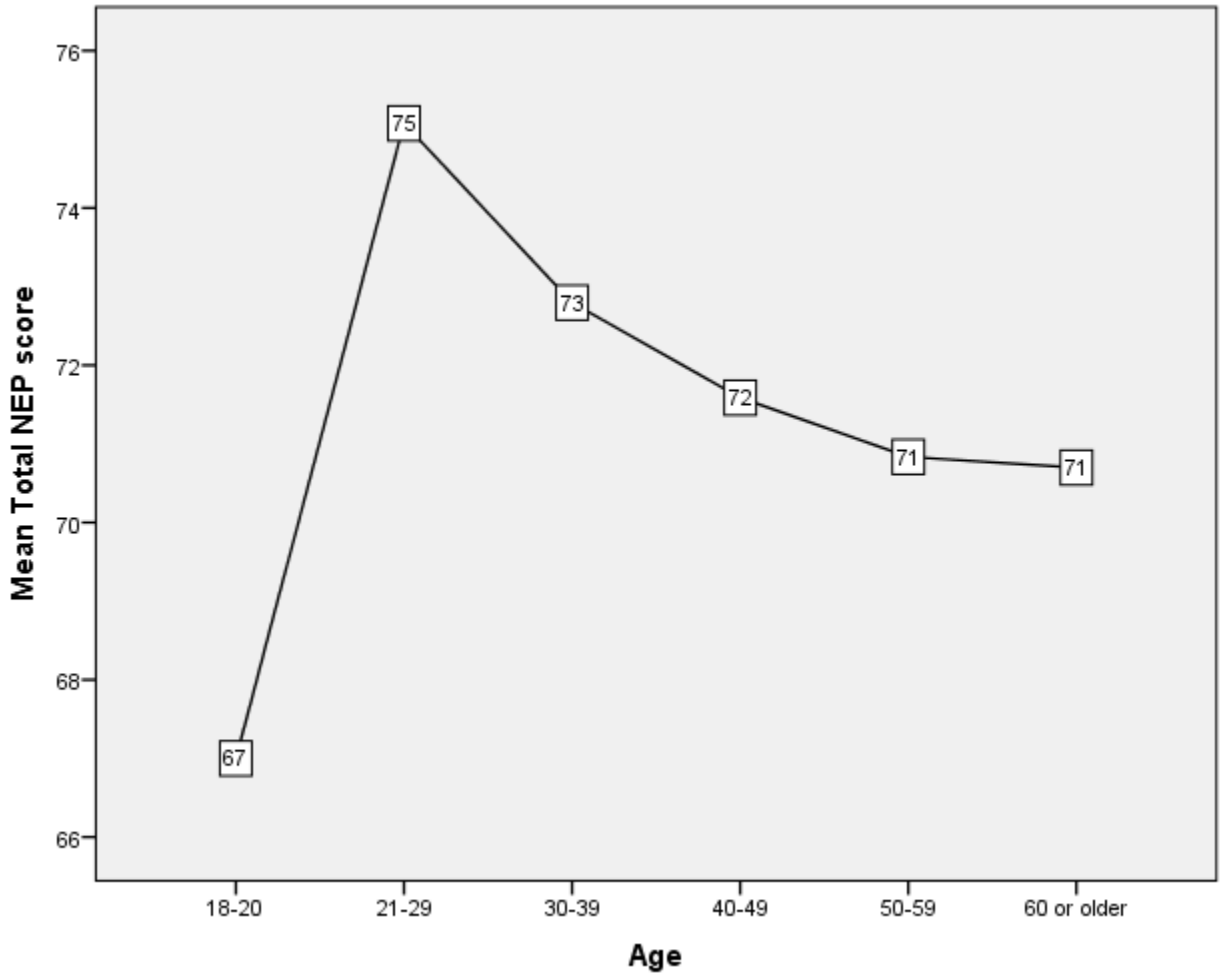

Figure 7. Average *NEP* scores based on respondent's *age*.

Six respondents (5%) in the 40-49 age group and five respondents (2%) in the over 60 age group reported a general willingness to not engage in any of the environmental behaviors related to this study. Between 20% and 30% of respondents in all age groups, except 18 to 20, reported a general willingness to convince others to

engage in environmental behavior. There is a slight negative correlation between a respondent's age and their environmental worldview, $r_s = -.042$, $p = .27$, but this relationship is not significant. The relationship between respondent's age and their willingness to engage in environmental behavior is also negative, $r_s = -.159$, $p < .05$, but these results are significant which implies that as the respondent ages, the less likely there are to actively participate in environmental behavior.

Each of the five states included in this study are nearly equally represented, but South Dakota (11%) is the least represented, and Kansas (26%) is the most represented. Equal state representation was expected because each state has a stake in the environmental health of the U.S. grasslands and each of the three groups included in this study have worked together within their states to create the state's wildlife action plan and other environmental programs. The proportional distribution between states is significantly different, $X^2 = 37.38$, $p < .05$, which, depending on the other variables, could affect the results of the study. There is less than a 2-point spread though in the environmental worldview and willingness to engage in environmental behavior reported amongst the states, which implies the respondent's state does not significantly affect their environmental worldview or willingness to engage in environmental behavior.

Sixteen respondents (2%) did not provide their highest obtained level of education; however, the remaining 666 respondents are generally well educated with 91% reporting having earned an associate degree or higher (Figure 8). Fourteen respondents (2%) reported earning a high school diploma or equivalent and 45 respondents (7%) attended college but did not earn a college degree. Given the nature of the study, the

level of educational attainment of the sample was not unexpected and does fit the educational profile of the region as described by the U.S. Census Bureau.

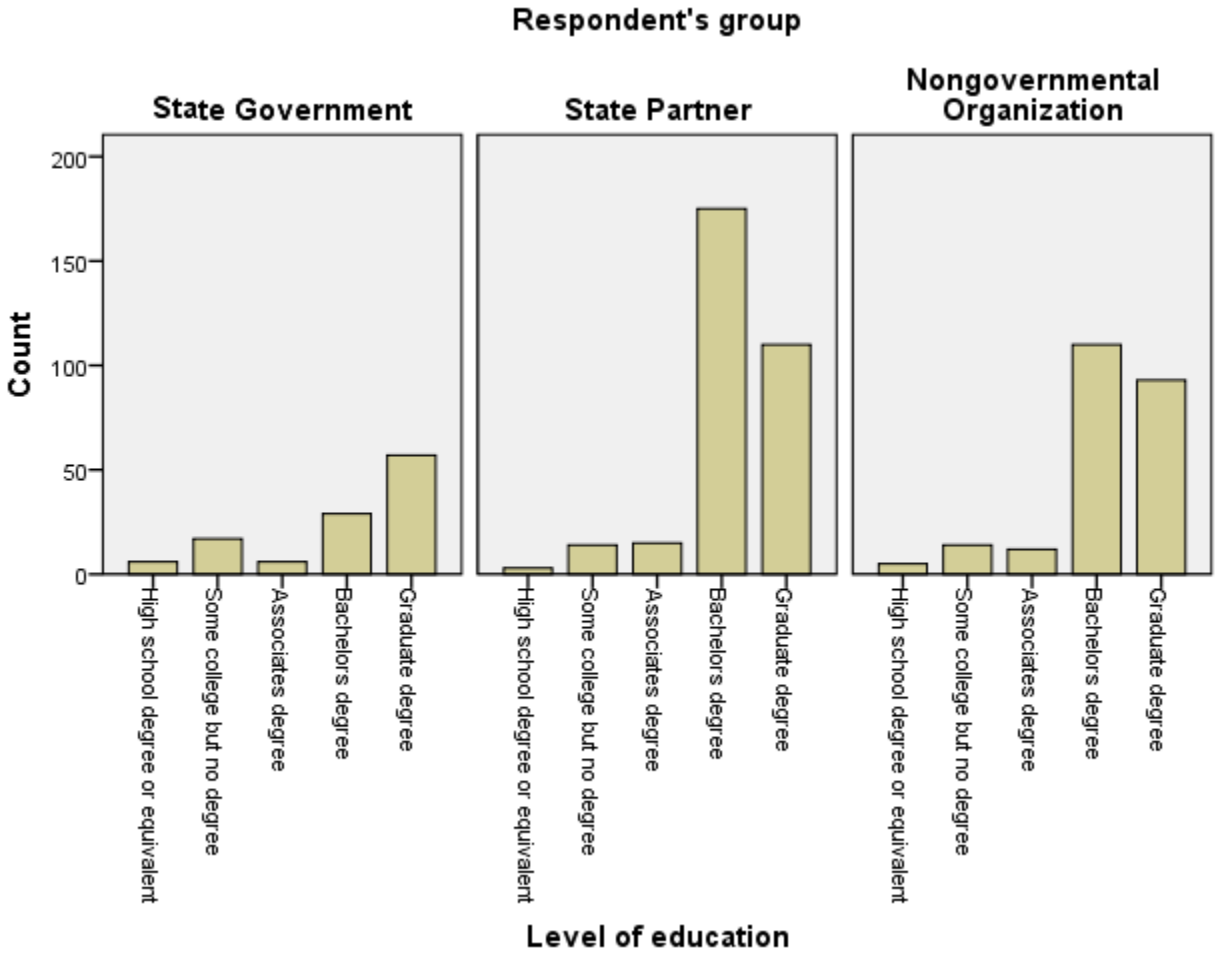

Figure 8. *Education* distribution of each group.

Many studies have found a correlation between environmental education and increased positive environmental worldviews (e.g., Soga et al., 2016; Spínola, 2015); however, my study involved general education and did not purposively select individuals with environmentally focused education. Respondents with no college education reported the least pro-ecological worldview (M = 63.93, SD = 10.709), and respondents

with a graduate degree generally reported a high pro-ecological worldview (*M* = 71.61, *SD* = 17.895); however, respondents with a bachelor degree had the most pro-ecological worldview (*M* = 73.61, *SD* = 13.659), which suggests that education does increase positive environmental worldviews, but there is, for this sample, no significant difference in environmental worldview between those with a bachelor degree and those with a graduate degree (Table 12).

Table 12

Average NEP Scores Based on Education

				95% Confidence Interval	
Level of Education	n	*M*	*SD*	Lower	Upper
High school degree or equivalent	14	63.93	10.709	57.75	70.11
Some college but no degree	45	65.27	20.469	59.12	71.42
Associates degree	33	66.18	14.882	60.90	71.46
Bachelor's degree	314	73.61	13.659	72.09	75.12
Graduate degree	260	71.61	17.895	69.42	73.79
Total	666	71.69	16.139	70.46	72.92

Like with the respondent's environmental worldview, there is a significant correlation between education and a willingness to engage in environmental behavior, but this positive relationship is very weak, $r_s = .084$, $p < .05$. There were 8 respondents (1%) with some college, but no degree, that reported a general willingness to not engage in any environmental behavior presented in this study. Respondents with a bachelor or graduate degree expressed a general desire to engage in all environmental behaviors and 153 respondents (23%) with a bachelor or graduate degree reported a willingness to convince others to engage in environmental behavior. These results support other studies (e.g., Soga et al., 2016) that found biophilia fades during middle childhood, but can be

reignited through personal experiences as an adult. Education plays a significant role in an individual's experiences, and many colleges and universities have campus opportunities to participate in environmental activities.

The self-identified ethnicity results of the respondents were not unexpected as the region is predominately White or Caucasian with less than 5% of other ethnicities according to the U.S. Census Bureau. Of the 670 respondents who provided this data, 94% of the respondents (n = 629) reported being White or Caucasian with the remaining 6% being reported as 3.7% Multiple Ethnicity (n = 25), and 1% American Indian (n = 8), African American (n = 4) and Hispanic (n = 4). The only ethnicity that does not fall within the expected range described by the U.S. Census Bureau were respondents who identified as Multiple Ethnicity. Twelve respondents (2%) utilized the Multiple Ethnicity textbox option to state that their race had nothing to do with the environment, they were American, and to report that the respondent was human. One respondent utilized the textbox to report being South Asian rather than selecting the Asian / Pacific Islander option.

Respondents who identified as Multi-Ethnic reported the least pro-ecological worldview (M = 59.48, SD = 21.529), while Hispanic respondents reported the most pro-ecological worldview (M = 79.00, SD = 17.321). When exploring environmental worldview and willingness to engage in environmental behavior through the respondent's ethnicity, it became clear that there was no significant relationship between the respondent's ethnicity and their environmental worldview or environmental behavior. High and low endorsements of the new ecological paradigm are found in every state and

every ethnicity, but with such low counts for non-White or Caucasian respondents, it is difficult to determine if these results are reflective of the respondent's personal experiences and beliefs or if they are reflective of regional differences between states (Table 13).

Table 13

Average NEP Scores Based on Ethnicity

				95% Confidence Interval	
Ethnicity	n	*M*	*SD*	Lower	Upper
American Indian or Alaskan Native	8	70.38	16.673	56.44	84.31
Black or African American	4	65.00	.000	65.00	65.00
Hispanic	4	79.00	17.321	51.44	106.56
White / Caucasian	629	72.40	15.616	71.18	73.62
Multiple Ethnicity	25	59.48	21.529	50.59	68.37
Total	670	71.89	16.013	70.67	73.10

Twenty-six respondents (4%) did not provide their political affiliation. Of the 656 respondents who did provide this information, 42% are Democrat (n = 280), 41% are Republican (n = 267), and 17% reported being an Independent (n = 109). Most respondents reported being an Independent (22%) or Independent within a political party (44%). For this study, I further divided political affiliation into strong, weak, and independent for Republican and Democrats. This allowed for a more focused analysis of how political affiliation may influence the respondent's environmental worldview and willingness to engage in environmental behavior.

There is a moderate negative relationship between the respondent's environmental worldview and their political affiliation, r_s = -.513, $p < .05$. Strong Democrats reported the most positive environmental worldview (M = 82.30, SD = 13.985) and Strong

Republicans reported the least positive environmental worldview (*M* = 56.41, *SD* = 20.697). Respondents identifying as Independent Republican (*M* = 63.72, *SD* = 13.597) or Independent Democrat (*M* = 78.44, *SD* = 11.856) reported less positive environmental worldviews than Weak Republicans or Weak Democrats (Table 14). These results were not unexpected, but the fact that all political party affiliations reported a generally positive environmental worldview suggests that ecological citizenship is, in fact, compatible to some degree with contemporary political processes in the United States.

Table 14

Average NEP Scores Based on Political Party Affiliation

				95% Confidence Interval	
Political Party	*n*	*M*	*SD*	Lower	Upper
Strong Democrat	104	82.30	13.985	79.58	85.02
Weak Democrat	28	80.68	7.404	77.81	83.55
Independent Democrat	148	78.44	11.856	76.51	80.37
Independent Independent	109	73.07	13.174	70.57	75.57
Independent Republican	146	63.72	13.597	61.50	65.94
Weak Republican	48	67.73	10.295	64.74	70.72
Strong Republican	73	56.41	20.697	51.58	61.24
Total	656	71.74	16.188	70.50	72.98

Respondents had a selection of five political values to choose from: Very Liberal, Liberal, Moderate, Conservative, and Very Conservative (Table 15). Twenty-one respondents (3%) opted to not respond to this question, but the remaining respondents were 10% Very Liberal (*n* = 64), 19% Liberal (*n* = 125), 39% Moderate (*n* = 257), 24% Conservative (*n* = 159), and 8% Very Conservative (*n* = 56). Respondents who identified as Very Liberal reported the most positive environmental worldview (*M* = 81.34, *SD* = 14.392), and those who identified as Very Conservative reported the least positive

environmental worldview (*M* = 56.18, *SD* = 19.825). Most respondents who identified as Democrat also identified as Liberal (*n* = 45) or Very Liberal (*n* = 48), whereas those who identified as Republican also identified as Conservative (*n* = 41) or Very Conservative (*n* = 29). Those who identified as an Independent Independent mostly reported being a Moderate (*n* = 76). No respondent who identified as either Strong or Weak Democrat identified as Conservative or Very Conservative, and no Strong or Weak Republican respondent identified as Liberal or Very Liberal.

Table 15

Average NEP Scores Based on Political Value

				95% Confidence Interval	
Political Value	*n*	*M*	*SD*	Lower	Upper
Very liberal	64	81.34	14.392	77.75	84.94
Liberal	125	82.75	11.829	80.66	84.85
Moderate	257	73.27	11.963	71.80	74.74
Conservative	159	62.06	14.510	59.79	64.34
Very conservative	56	56.18	19.825	50.87	61.49
Total	661	71.70	16.145	70.47	72.94

The respondent's political party affiliation and political values combine to produce strong influences on their environmental worldview. There is a 30-point gap in average environmental worldviews within Independent Independents, which is the only political party affiliation to contain all five political values. Environmental worldviews became more positive as political values changed from Very Conservative to Moderate for Republican respondents, and environmental worldviews became less positive as values changed from Very Liberal to Moderate for Democrat respondents.

The respondent's willingness to engage in environmental behavior follows a similar pattern with Democrats reporting a higher willingness to engage in environmental behavior and Republicans reporting a lower willingness (Figure 9); however, there were 11 respondents (1 Strong Democrat, 1 Independent Republican, 9 Strong Republicans) who reported a general desire to not engage in any form of environmental behavior. These same 11 respondents (1 Very Liberal, 1 Conservative, 9 Very Conservative) are also the only respondents not willing to engage in any form of ecological behavior based on their political values. Strong Republicans were the least likely to use recycled grocery bags (3%) or stop buying bottled water (4%). The desire to not carpool was bipartisan with 10 Strong Democrats (1%), 43 Independents (6%), and 27 Strong Republicans (4%) all reporting a general unwillingness to carpool. The willingness to pay a gas surcharge was polarizing with 190 Republican respondents (29%) rejecting the idea outright, compared to 22 Democrats (3%). Eighty-Seven Republicans (13%) are also not willing to reduce their electronic device usage compared to 29 Democrats (4%).

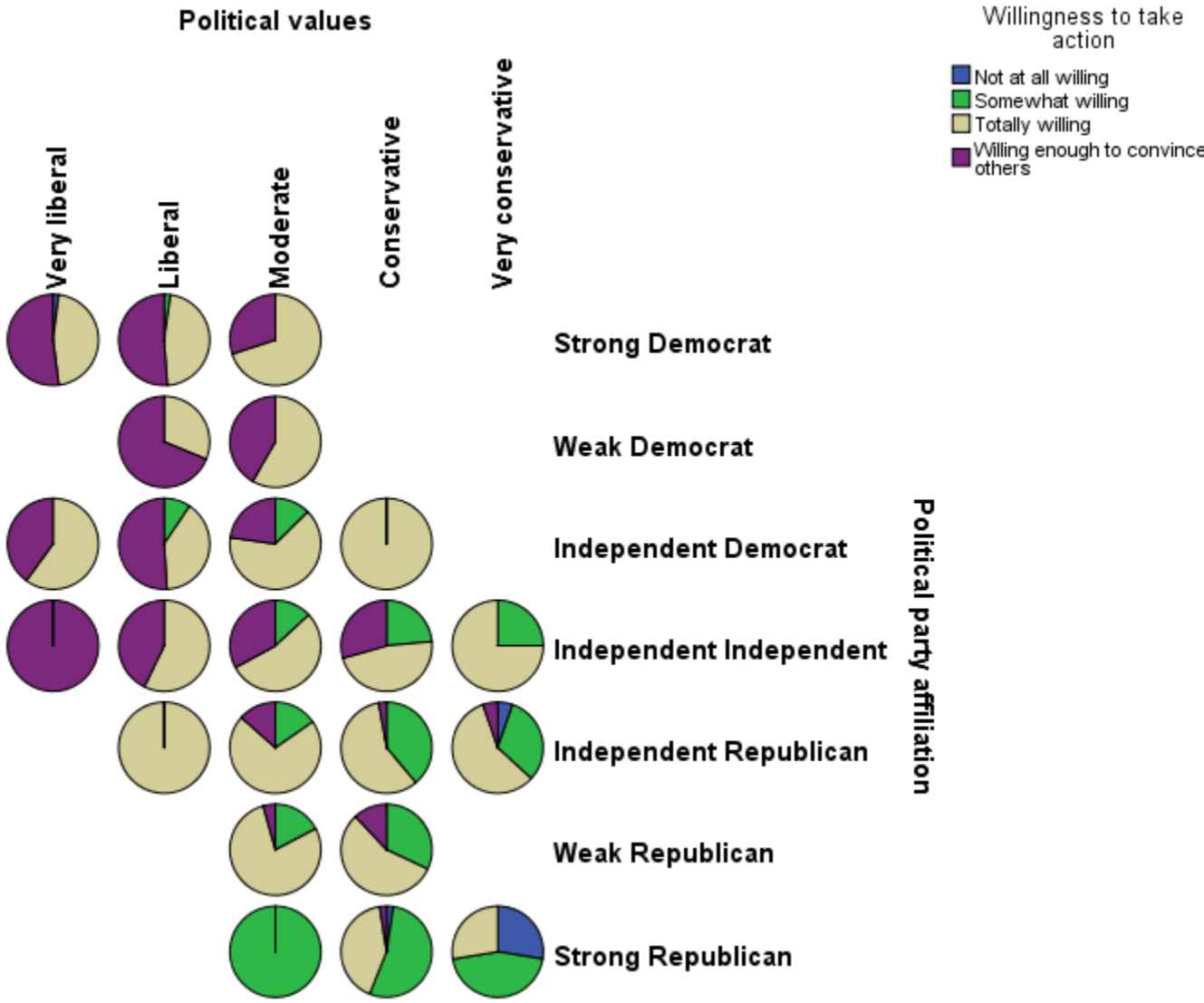

Figure 9. Distribution of WTTA by political values and party affiliation.

Factors of Ecological Citizenship

Survey question 4 included 12 Likert-scaled items that explored four distinct factors of ecological citizenship: social justice, public/private demarcation, unbounded responsibility, and non-reciprocal responsibility. Overall reliability for question four was acceptable, $\alpha = .71$; however, the Cronbach alpha results for each factor indicated that

only social justice, α = .76, and unbounded responsibility, α = .72, were reliable, therefore, items pertaining to the public/private demarcation, α = .30, and non-reciprocal responsibility, α = .32, were removed from further analysis (Table 16). Values for both social justice and unbounded responsibility range from 3 to 21.

Table 16

Percentage and Mean Distribution for Factors of Ecological Citizenship

Item – Do you agree or disagree:	SD	D	SWD	N	SWA	A	SA	*M*
The ecological health of the U.S. grasslands is the shared responsibility of landowners, agencies, organizations, and communities within the region	0.3	1.0	2.3	3.4	13.3	32.3	47.4	6.15
Residents of the grasslands are responsible for reducing food waste through sustainable consumption	3.7	4.5	5.9	24.9	28.2	24.5	8.4	4.76
Environmental polluters should be taxed on their pollution to pay for correcting their environmental damage	4.3	2.8	2.6	9.4	17.0	26.1	37.8	5.62
Buying goods in the U.S. negatively impacts the environment in other countries	13.0	25.8	9.5	25.4	12.6	10.6	3.1	3.43
Consumers are obligated to consider the production worker's rights when buying goods produced outside of the United States	6.3	9.7	8.5	20.7	29.2	18.5	7.2	4.41
Consumers are obligated to consider future generations when making purchases	4.7	4.1	5.9	16.3	29.6	22.7	16.7	4.97

Note. SD = strongly disagree, SWD = somewhat disagree, D = disagree, N = neither agree or disagree, SWA = somewhat agree, A = agree, SA = strongly agree.

The respondents shared a general high regard for both social justice (*M* = 16.48, *SD* = 3.438) and unbounded responsibility (*M* = 12.75, *SD* = 3.913). Respondents in Group 1 (*M* = 14.21, *SD* = 4.970) supported social justice less than Group 2 (*M* = 16.98, *SD* = 2.812) or Group 3 (*M* = 16.92, *SD* = 2.814), but all three groups shared a moderate view on unbounded responsibility. Men and women share similar views on ecological justice and unbounded responsibility (Figure 10). Views on social justice and unbounded responsibility follow the same trend as environmental worldview and willingness to engage in environmental behavior with Democrats supporting both factors more than Republicans, and Liberals supporting them more than Conservatives.

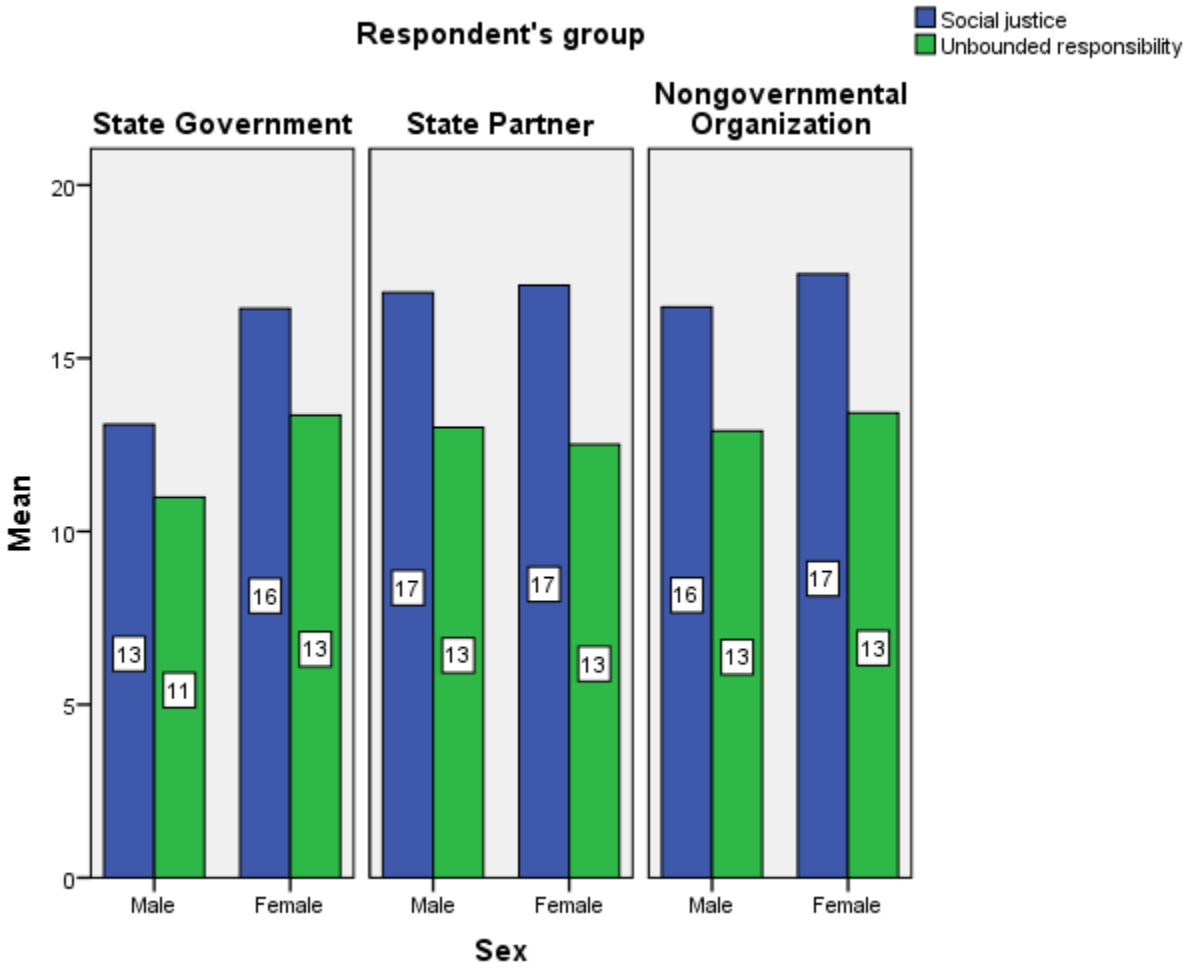

Figure 10. Average social and unbounded scores based on sex and group.

A respondent's political party affiliation, political values, views on social justice, and views on unbounded responsibility are all correlated, but there is a negative correlation between the political views and views on ecological citizenship, r_s = -.344, p < .05. This is important because as individuals, each respondent engages in activities that reflect both social justice and unbounded responsibility. For example, a respondent can purchase fair trade goods from a supplier that guarantees a fair price was paid and that no child labor was involved, thereby exhibiting a positive view on unbounded responsibility,

but as vote against increasing fines for pollution or vote against improving food reclamations, thereby exhibiting a negative view on social justice. Understanding the personal motivation toward various factors of ecological citizenship is beyond the scope of this study, but each group faces the same conflict between personal and professional action.

Perceptions on Equitable Access to Nature

The three items on unbounded responsibility focused on obligations to others based on individual choices but did not address obligations to other community members. The first of three open-ended questions fill that gap by asking for the respondent's view on whether their state government ensures equal access to nature for all state residents. Only 83% of respondents (n = 566) responded to this question. Considering that this region is more than 90% privately owned, it was not surprising that only 33% of respondents (n = 186) believed there was equal access to nature, and 22% (n = 126) did not know if the state ensured equal access to nature.

Very unexpected results were found when the sample's responses were broken down by the respondent's group (Figure 11). Only 18 respondents (19%) in Group 1 believed that their state governments ensured equal access to natural resources in their states compared to 110 respondents (40%) in Group 2 and 58 respondents (29%) in Group 3. Many respondents who believed their states do provide equal access and provided an explanation for their response believe that there are no access restrictions to state parks and that the state is under no obligation to provide equal access to most resources.

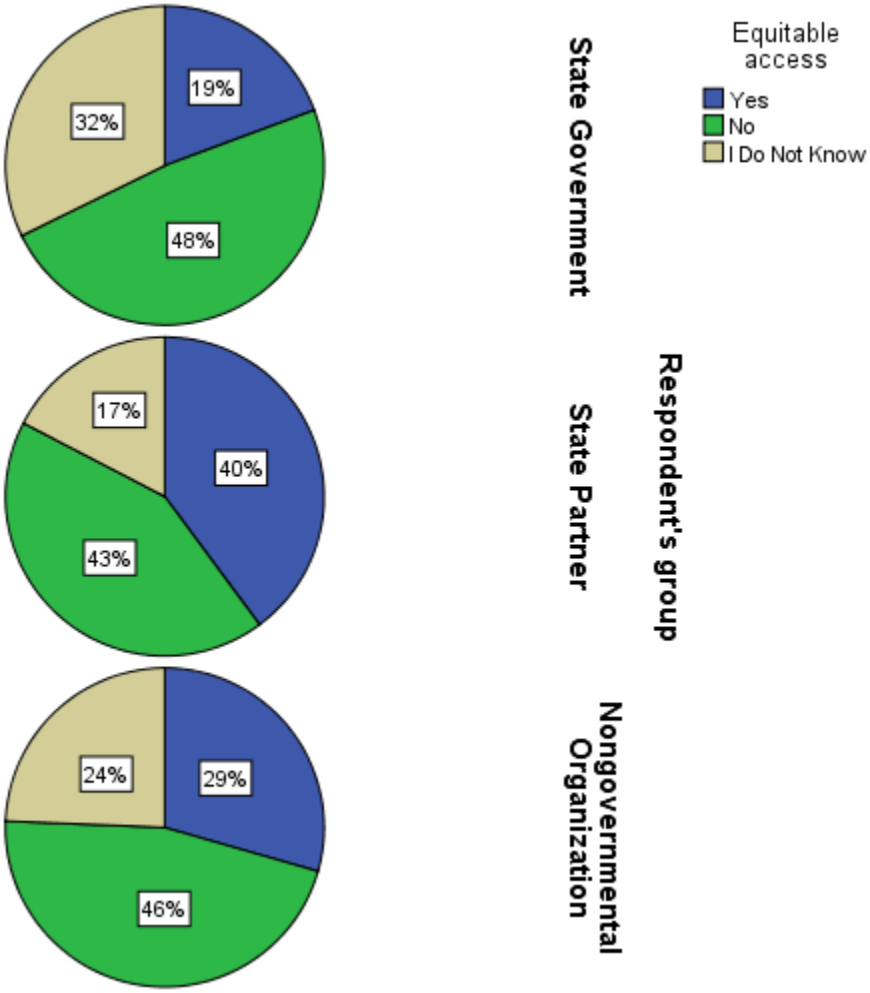

Figure 11. Perceptions of equal access based on group.

An interesting contradictory view was found in those who do not believe (*n* = 254) their states provides equal access to resources. Many respondents noted that their states were primarily privately owned and that the state favored agricultural and oil needs above the needs of the community. A few respondents noted that they had no knowledge of public lands within their states that would consider natural lands. A recurring theme in the open-ended response though is that the state does not own much of the grasslands, so it is the responsibility of the land owner to decide if they want to open their land for

public use. In terms of ecological citizenship, this theme supports the dominant social paradigm rather than the pro-ecological paradigm, which implies there is room for improvement in attitude towards equitable access to natural resources in the grasslands.

Perceptions on Public Participation and State Partners

All state wildlife action plans highlight the need for partnerships between state agencies, environmental organizations, and other interested parties. These partnerships create and implement state-wide conservation projects that benefit the region. The second open-ended question addressed the perceived promotion, or willingness to participate, in state organization partnerships to address the environmental needs of the community and grasslands. One hundred and two respondents (15%) elected to not participate with this question. Of the remaining 580 respondents, 69% believed that state partnerships promote public participation when developing environmental policies and programs (Figure 12). While all groups have the potential to partner together, Group 2 was created specifically through identified partnerships that created the state wildlife action plan and 70% of respondents (n = 202) in this group believed their partnership promoted public participation in the process. Group 3 had the lowest proportion of respondents who believed their input into state environmental policy was welcome (22%).

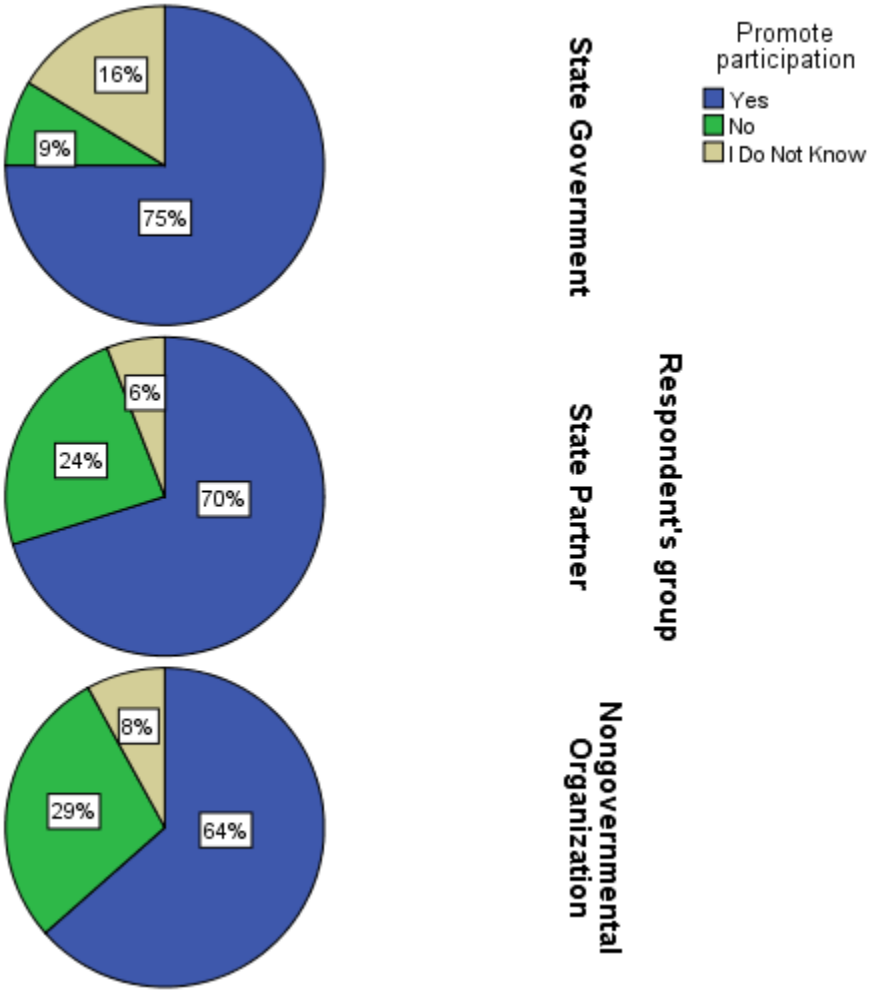

Figure 12. Perception of promoted participation by group.

Less than 30% of respondents who participated in this question provided further explanation of their response; however, several themes appeared in their expanded responses. There is a clear separation between public participation and collaboration. As several respondents in Group 3 noted, state agencies and legislators are interested only in public input, not actively collaborating with organizations whose mission is to engage the public in environmental activities. However, several respondents in Group 1 noted that public input is required by law for many policies, but special interest groups, such as

those in Group 3, only represent their group and not the public. Several respondents in Group 1 view organizations in Group 2 and 3 as "worse than a waste" and as "ideologically leftist environmental groups" that try to "eliminate predators from the ecosystem" so that hunting clubs have greater enjoyment. The acrimonious attitude between some state legislators, state partners, and environmental organizations may negatively influence the development of ecological citizenship within the community by unintentionally dividing the community based on these attitudes.

Perception on Environmental Opportunities Offered by NGOs

State lawmakers and state partners create the laws and regulations that govern environmental behavior within their states, but NGOs offer the opportunity for the public to actively engage in environmental behavior through programs frequently created with state or agency funding. Almost 17% of the respondents selected not to participate in this question, but 51% of the respondents that did participate (n = 289) believed that environmental organizations in their states offered enough opportunities for those residents who did want to participate, while 39% (n = 223) did not feel there were enough opportunities (Figure 13). Many respondents cited transportation and income as barriers to participating in environmental opportunities provided by environmental organizations.

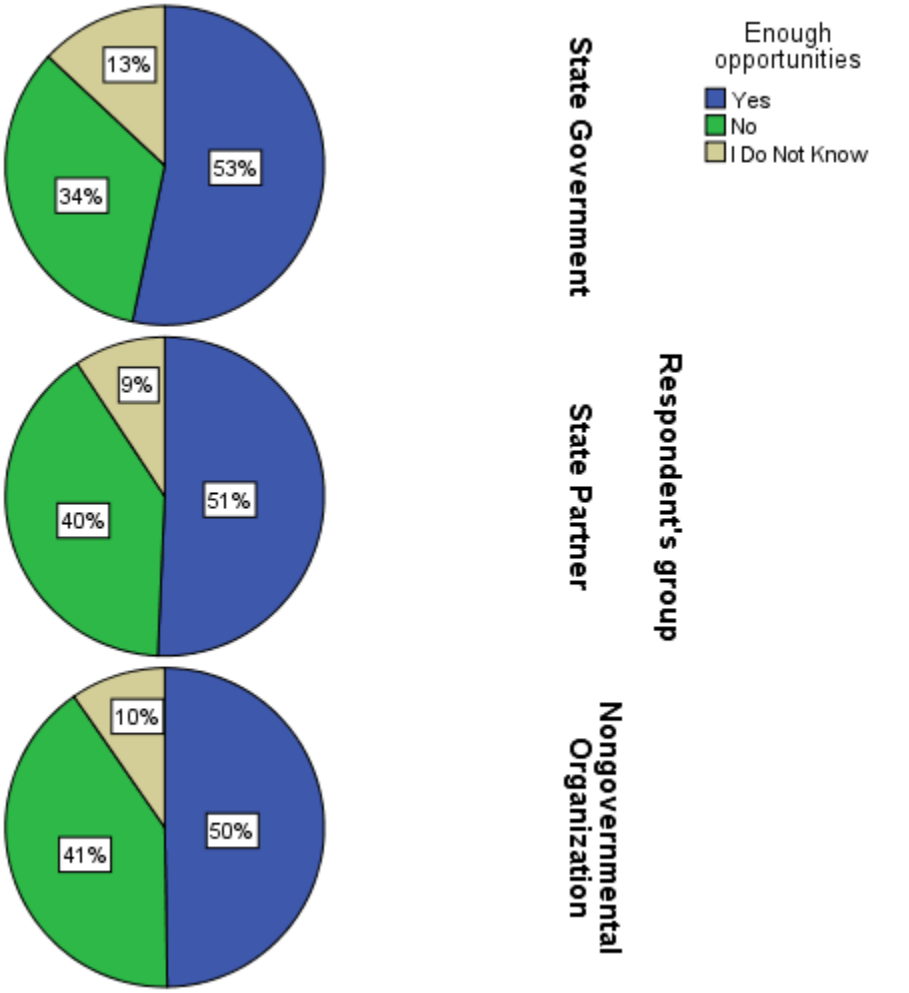

Figure 13. Perceptions on opportunities by group.

Roughly half of each group believed there were ample opportunities to participate, but as one respondent in Group 1 noted, they are "not going to bus people to the grasslands for free to watch the butterflies." Respondents in Group 3 represent environmental organizations in this study, and 50% believe their organization does provide ample opportunities, while 40% do not, and 10% did not respond to the question. Few respondents who believe there is ample opportunity expanded their responses; however, two respondents noted that while there were opportunities available, they were

not for everyone as “a lot of people are just trying to survive which puts the thoughts of helping with the environment on the back burner” and that “people are afraid to expose themselves in fear of retaliation” since environmental activism is considered radical in their states.

Most respondents in Group 3 who did not believe there were ample opportunities expanded their responses. One common self-reported theme was the general lack of funding for programs, which further highlights the animosity between some respondents in Groups 1 and 3. Determining the funding sources of Group 3 was beyond the scope of this study. Another common theme related to the organizations themselves with several respondents noting that the organization only wants the individual’s money and monthly dues to belong to the organization meant that only wealthy people could participate. The last theme that emerged from their expanded responses was that the organizations had programs available, but only advertised in areas that would be seen by selected individuals. Many respondents implied there was a racial bias in determining where organizations advertised and who they marketed their opportunities to.

The expanded perceptions found in Group 3 are not shared by the other two groups. Many respondents in Group 1 noted that their states have great environmental organizations that provide ample opportunities if people want to participate. This perception shifts the focus away from state funding issues and makes it a personal funding issue which supports the contrasting results in environmental worldview between the groups. Respondents in Group 2 were most critical of the environmental opportunities offered by Group 3. Several respondents noted that organizations held

fundraisers for themselves but provided very little for their members. Some respondents in Group 2 noted that opportunities were advertised in only English, and that organizations were too selective in who could attend the function. Some respondents in Group 2 represent environmental NGOs and they noted a difficulty in finding volunteers under 50 which decreases participation by younger people. This question produced the most finger-pointing results, but all three groups noted the lack of general willingness to participate found within their community. These results are echoed in the respondent's own willingness to fully engage in all types of environmental behavior.

Summary of Descriptive Statistics

Group 1 (n = 117) consisted of primarily White male state legislators over the age of 60. All five states were represented in the group although with uneven distribution as Nebraska was underrepresented. The respondents in this group were well educated with over 76% having earned at least a bachelor's degree. Both democrats and republicans were well represented with neither party resulting in a large skew of the results. Conservative values outweighed Liberal values, but 34% of the group reported being a Moderate. More than half the group believe their states offers enough opportunities to participate in environmental activities and 75% believe that state organization partnerships promote public participation in environmental policy development, but only 20% believe that there is equitable access to natural resources in their states. Respondents in Group 1 reported an environmental worldview 14 points lower than the other two groups, but the average respondent does exhibit a proenvironmental worldview (M = 60.48, SD = 18.993). This worldview may contribute to their willingness to engage

in some forms of environmental behavior (*M* = 13.42, *SD* = 4.476). Respondents in Group 1 report a higher obligation to their community (*M* = 14.21, *SD* = 4.970) than the global community (*M* = 11.78, *SD* = 5.161).

Group 2 (*n* = 328) was primarily White men over the age of 21. All five states were represented in the group although with uneven distribution as North Dakota and South Dakota were underrepresented. The respondents in this group were well educated with 90% reporting having earned at least a bachelor's degree. Both democrats and republicans were well represented with neither party resulting in a large skew of the results. Conservative values outweighed Liberal values, but 46% of the group reported being a Moderate. More than half the group believe their states offer enough opportunities to participate in environmental activities and 70% believe that state organization partnerships promote public participation in environmental policy development, while 40% believe that there is equitable access to natural resources in their states. Respondents in Group 2 reported an environmental worldview like Group 3, and the average respondent exhibits a proenvironmental worldview (*M* = 74.06, *SD* = 13.915). This worldview may contribute to their willingness to engage in some forms of environmental behavior (*M* = 16.49, *SD* = 3.555). Respondents in Group 2 report a higher obligation to their community (*M* = 16.98, *SD* = 2.812) than the global community (*M* = 12.81, *SD* = 3.679).

Group 3 (*n* = 237) was primarily White men over the age of 30. All five states were represented in the group although with uneven distribution as North Dakota was overrepresented. The respondents in this group were well educated with 88% reporting

having earned at least a bachelor's degree. Both democrats and republicans were represented; however, there is a skew toward Republican. Political values were nearly evenly distributed, and 31% of the group reported being a Moderate. Half the group believe their states offer enough opportunities to participate in environmental activities and 65% believe that state organization partnerships promote public participation in environmental policy development, while only 29% believe that there is equitable access to natural resources in their states. Respondents in Group 3 reported an environmental worldview like Group 2, and the average respondent exhibits a proenvironmental worldview (M = 74.09, SD = 15.236). This worldview may contribute to their willingness to engage in some forms of environmental behavior (M = 16.29, SD = 3.546). Respondents in Group 3 report a higher obligation to their community (M = 16.92, SD = 2.814) than the global community (M = 13.14, SD = 3.421).

Results

In the descriptive statistics section, I discussed the results of Spearman correlational testing between the respondent's political values and party affiliation; however, I did not examine the relationship between the respondent's environmental worldview and their willingness to take action. The results of a Pearson correlation test on these two variables indicated that there is a moderate, yet significant relationship between the respondent's environmental worldview and their willingness to engage in environmental behavior, $r(682) = .670$, $p < .05$. The hypothesis testing for each research question examines if this relationship holds for each group.

Research Question 1: Perceived Role of State Government

The first research question posed in this study was: What roles do state legislators and agents perceive that state governments can play in fostering ecological citizenship among residents in their states? The results of a Pearson correlation test on Group 1's *NEP* and *WTTA* indicated there is a strong positive relationship between the state legislator's environmental worldview and their individual willingness to engage in selected environmental behaviors, $r(117) = .784$, $p < .05$. The null hypothesis that there is no significant relationship between a state legislator's environmental worldview and their willingness to take action is rejected. As a state legislator adopts a pro-ecological worldview, the more willing they are to actively help the environment through individual action; however, as the descriptive analysis found, their willingness may not be applied equally to different environmental actions. To explore this relationship further, I conducted a linear regression analysis to first determine if the state legislator's environmental worldview can predict their general willingness to take action.

There are six assumptions to linear regression. For hypothesis testing, both the *NEP* and *WTTA* are measured on a continuous scale which satisfied the first assumption. Analyzing a scatterplot of *NEP* and *WTTA* scores indicated there is a linear relationship between the two variables, thereby satisfying the 2nd assumption of linear regression. A case-wise analysis did not indicate any outliers outside of three standard deviations, thereby satisfying the third assumption of linear regression. The Durbin-Watson statistic, $d = 1.859$, indicated that the data is not autocorrelated, which satisfies the fourth assumption of independent observations. A scatterplot of the residuals of the predicted

value and residual indicated a slight heteroskedasticity of the data, but this may be the result of the small sample size rather than a violation of the fifth assumption of homoscedasticity. The final assumption of a linear regression is the normal distribution of the residuals and was satisfied through a Normal P-P plot. As there is only one independent variable in this regression, there is no need to test for multicollinearity, or correlation between independent variables that may influence the analysis. With the assumptions of linear regression met for Group 1, I proceeded with the analysis.

The results of the liner regression analysis indicated that the state legislator's environmental worldview significantly predicted their willingness to take action, $\beta = .185$, $p < .05$, $R^2 = .61$ (Table 17). Respondent's predicted willingness to take action is equal to 2.247 + .185 (*NEP*) when environmental worldview is measured as a continuous variable. Respondent's willingness to take action increased .185 points for every 1-point increase in *NEP*. As the respondent adopts a pro-ecological worldview, their willingness to engage in environmental behavior increases. The respondent's environmental worldview accounts for 61% of the variation in their willingness to take action, thereby further supporting the rejection of the null hypothesis for research question 1. As the *NEP* accounts for more than half the variation in *WTTA* scores within Group 1, no further analysis will be taken; however, these results and what may account for the other 40% of variation in *WTTA* will be discussed in Chapter 5.

Table 17

Simple Linear Regression Analysis for WTTA in Group 1

	B	SE B	β	*t*	*p*
(constant)	2.247	.865		2.598	.011
Total NEP Score	.185	.014	.784	13.532	.000

$R^2 = .61$

Research Question 2: Perceived Role of State Partners

The second research question posed in this study was: What role do state organization partnership directors and staff perceive that their partnership can play in fostering ecological citizenship among residents in their states? The results of a Pearson correlation test on Group 2's *NEP* and *WTTA* indicated there is a significant moderately positive relationship between the respondent's environmental worldview and their individual willingness to engage in selected environmental behaviors, $r(328) = .569$, $p < .05$. The null hypothesis that there is no significant relationship between a state organization partnership director and staff's environmental worldview and their willingness to take action is rejected. As a member of a state partnering organization or agency adopts a pro-ecological worldview, the more willing they are to actively help the environment through individual action; however, as the descriptive analysis found, their willingness may not be applied equally to different environmental actions. To explore this relationship further, I conducted a linear regression analysis to first determine if the director or staff's environmental worldview can predict their general willingness to take action.

As research question 2 utilizes the same dependent and independent variable as Research Question 1, the first and second assumptions have been met. No case-wise

outliers were identified and the Durbin-Watson statistic, d = 1.937, indicated the data is not autocorrelated, thereby satisfying the third and fourth assumptions. The Normal P-P plot indicated a normal distribution of the residuals and a scatterplot of the residual and predicted value indicated homoscedasticity. With all assumptions of linear regression met, I continued with the analysis.

The results of the regression test indicated that the state organization partnership director and staff's environmental worldview significantly predicted their willingness to take action, $\beta = .145$, $p < .05$, $R^2 = .32$ (Table 18). Respondent's predicted willingness to take action is equal to 5.725 + .145 (*NEP*) when environmental worldview is measured as a continuous variable. Respondent's willingness to take action increased .145 points for every 1-point increase in *NEP*. As the respondent adopts a pro-ecological worldview, their willingness to engage in environmental behavior increases. The state organization partnership director and staff's environmental worldview accounts for 32% of the variation in their willingness to engage in selected environmental behaviors, which further supports the rejection of the null hypothesis; however, since the *NEP* accounts for less than 50% of the variation in *WTTA* further exploration into ecological citizenship within this group is warranted, but is outside the scope of this study; however, a multiple linear regression analysis indicated that only the respondent's age and political values were also significant predictors of their willingness to take action (Table 19).

Table 18

Simple Linear Regression Analysis for WTTA in Group 2

	B	SE B	β	*t*	*p*
(constant)	5.725	.877		6.530	.000
Total NEP Score	.145	.012	.569	12.493	.000

$R^2 = .32$

Table 19

Summary of Multiple Linear Regression for WTTA

	B	SE B	β	*t*	*p*
(Constant)	14.599	3.368		4.335	.000
Respondent's state	-.055	.162	-.015	-.343	.732
Age	-.295	.118	-.111	-2.499	.013
Sex	.189	.341	.026	.554	.580
Race / Ethnicity	-.112	.521	-.010	-.214	.831
Level of education	.005	.211	.001	.023	.981
Political party affiliation	-.188	.154	-.088	-1.224	.222
Political values	-.998	.282	-.266	-3.534	.000
Total NEP score	.105	.014	.398	7.696	.000

$R^2 = .43$

Research Question 3: Perceived Role of NGOs

The third research question posed in this study was: What role do NGO administrators and staff feel their organizations can play in fostering ecological citizenship among residents in their states? The results of a Pearson correlation test on Group 3's *NEP* and *WTTA* indicated there is a significant moderately positive relationship between the respondent's environmental worldview and their individual willingness to engage in selected environmental behaviors, $r(237) = .613$, $p < .05$. The null hypothesis that there is no significant relationship between NGO administrator and staff's environmental worldview and their willingness to take action is rejected. As an environmental NGO administrator or staff member adopts a pro-ecological worldview,

the more willing they are to actively help the environment through individual action; however, as the descriptive analysis found, their willingness may not be applied equally to different environmental actions. To explore this relationship further, I conducted a linear regression analysis to first determine if the administrator or staff's environmental worldview can predict their general willingness to take action.

As research question 3 utilizes the same dependent and independent variable as Research Question 1 and 2, the first and second assumptions have been met. No case-wise outliers were identified and the Durbin-Watson statistic, d = 2.095, indicated the data is not autocorrelated, thereby satisfying the third and fourth assumptions. The Normal P-P plot indicated a normal distribution of the residuals and a scatterplot of the residual and predicted value indicated homoscedasticity. With all assumptions of linear regression met, I continued with the analysis.

The results of the regression test indicated that the NGO administrator and staff's environmental worldview significantly predicted their willingness to take action, $\beta = .143$, $p < .05$, $R^2 = .38$ (Table 20). Respondent's predicted willingness to take action is equal to 5.730 + .143 (*NEP*) when environmental worldview is measured as a continuous variable. Respondent's willingness to take action increased .143 points for every 1-point increase in *NEP*. As the respondent adopts a pro-ecological worldview, their willingness to engage in environmental behavior increases. The NGO director and staff's environmental worldview accounts for 38% of the variation in their willingness to engage in selected environmental behaviors, which further supports the rejection of the null hypothesis; however, since the NEP accounts for less than 50% of the variation in WTTA

further exploration into ecological citizenship within this group is warranted, but is outside the scope of this study; however a multiple linear regression analysis indicated that only the respondent's political party affiliation was also a significant predictor (Table 21).

Table 20

Simple Linear Regression Analysis for WTTA in Group 3

	B	SE B	β	*t*	*p*
(constant)	5.730	.908		6.314	.000
Total NEP Score	.143	.012	.613	11.879	.000

$R^2 = .37$

Table 21

Multiple Linear Regression Analysis for WTTA in Group 3

	B	SE B	β	*t*	*p*
(Constant)	13.173	2.308		5.707	.000
Total NEP score	.101	.014	.434	7.375	.000
Respondent's state	-.066	.127	-.026	-.522	.602
Age	-.177	.128	-.070	-1.388	.167
Sex	.505	.380	.070	1.329	.185
Race / Ethnicity	.074	.247	.015	.300	.764
Level of education	-.137	.204	-.035	-.671	.503
Political party affiliation	-.523	.168	-.251	-3.121	.002
Political values	-.332	.249	-.110	-1.331	.185

$R^2 = .48$

Summary

Chapters 1 through 3 established the need and scope for this study and Chapter 4 presented the results of the study conducted to better understand the perceived role of three distinct groups that can directly and indirectly influence the development of ecological citizenship within their states. The first group, state legislators, indirectly influences the development of ecological citizenship within their states through the laws

they develop, but these laws have the ability to directly foster ecological citizenship within the other two groups. The second group, state organization partners, directly influences the development of ecological citizenship within their states through state-wide programs such as the Chickadee Program in Kansas and Monarch Watch throughout the region. The second group also indirectly influences the fostering of ecological citizenship through their relationship with state legislators. The last group, environmental NGOs, have the most direct influence on the development of ecological citizenship within their states through the hand-on opportunities they provide to residents and visitors within the grasslands. The third group also has direct influence on the fostering of ecological citizenship within the other two groups through lobbying and other political processes. Previous studies have focused on individual development of ecological citizenship through their personal values, norms, and other internal motivators; however, few studies have explored ecological citizenship from the external perspective. The results of this study fill that gap while exposing more gaps within these three groups that may be significant to understanding the development and fostering of ecological citizenship within the grasslands.

An exploratory analysis of the 682 respondents found that the three groups were distinct in their age distribution, with younger respondents favoring partnerships or NGOs over state legislatures, although this may simply be the result of the political process itself. All five states were represented, as were levels of educational attainment; however, as with age, the distribution between groups and within groups were statistically different. These differences in distribution imply that the results of this study

may not be applicable to the region, but results do suggest there are clear and distinct relationships between variables found within each group.

I found that respondents who identified as Democrat or liberal reported a more pro-ecological worldview than those who identifies as Republican or conservative. This result is important because Dobson (2000) believed that ecological citizenship was incompatible with certain political views and values; however, in this study, all political views and values reported some form of pro-ecological worldview. This study's results also support Soga et al. (2012) in their findings that an individual's environmental worldview depends on education, as respondents who reported earning a college degree also reported a more pro-ecological worldview and an increased willingness to engage in environmental behavior.

This study focused on two groups of ecological behaviors included in the *WTTA*: sustainable development and sustainable consumption. Results indicated that respondents were more willing to engage in behavior that affects others than behaviors that require the most personal sacrifice. Respondents were more willing to plant native plants in their yard than pay a gasoline surcharge to pay for greenhouse gas emissions, yet 37% of respondents believed that environmental polluters should be fined. The individual/public dichotomy was found in the respondent's perception of the other two groups as well. All three groups were critical of each other and many respondents blamed the other groups for not doing enough to help the environment or neglecting to represent the entire community rather than select interest groups.

After gaining an insight into the group's characteristics and beliefs, I conducted a correlation analysis and linear regression to determine if there actually was a relationship between the respondent's environmental worldview and their willingness to take action. The results of the correlation tests indicated that there was a positive relationship within each of the groups; however, the regression analyses indicated that the respondent's worldview contributed more to the variance in WTTA in Group 1 than the other two groups. Only a third of the variation in WTTA is explained by their worldview in Groups 2 and 3. Other factors may be attributable to the remaining variance, but they are outside the scope of this study. Chapter 5 discusses these results and how they relate to other studies as well as discusses how limitations in this study highlighted more questions that need to be answered to fully understand the development and fostering of ecological citizenship within the United States.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

My purpose in this quantitative study was to explore the perceived roles of state legislators, state organization partnership directors, and NGO administrators in the development and fostering of ecological citizenship within Iowa, Kansas, Nebraska, North Dakota, and South Dakota. Most studies on ecological citizenship focused on internal development, or development based on the individual's values and ethics, but I found no studies that focused on the perceived role of external agents. External agents have the power to influence the development and fostering of ecological citizenship through public policy, public programs, private programs, and individual interaction. The results of an online survey, correlation analysis, and regression testing indicated that the respondent's environmental worldview is significantly correlated to their willingness to engage in environmental behavior, but the amount of explained variance in the respondent's environmental behavior based on their worldview ranged from 32% for state organization partnership directors to 61% for state legislators. Further analysis for state organization partnership directors and NGO administrators indicated that the respondent's political values, political party affiliation, and age may also be predictors of ecological behavior.

This chapter begins with a thorough discussion of the results in terms of confirming, disconfirming, or extending what is known about the development and fostering of ecological citizenship, and how ecological citizenship can be developed through Bronfenbrenner's bioecological model lens. The nature of the bioecological

model allows for the narrowed focus on entities within the exosystem and how individuals within these entities perceive their roles in the development of ecological citizenship through public policy and programs. In this chapter, I also expand on the limitations of the study that I highlighted in Chapter 3 to include new limitations discovered during data collection and analysis. Recommendations for further study as well as the implications of this study on positive social change and public policy complete this chapter.

Interpretation of the Findings

This quantitative study had three expressed research questions:

- What roles do state legislators and agents perceive that state governments can play in fostering ecological citizenship among residents in their states?
- What roles do state organization partner directors and staff perceive that their partnerships can play in fostering ecological citizenship among residents in their states?
- What roles do NGO administrators and staff feel their organizations can play in fostering ecological citizenship among residents in their states?

There was one unstated research question that I also included in this study: Does ecological citizenship exist within any of the three groups included in this study? This section begins with the unstated research question, and then I examine the results of the expressed research questions in depth.

Ecological Citizens in the U.S. Grasslands

There were 168 individuals (91 female and 71 male) who participated in the current study who could be defined as ecological citizens by their pro-ecological worldview and willingness to take action. I found ecological citizens in each of the three groups; however, Group 2 (27%) and Group 3 (27%) had higher proportions of ecological citizens than Group 1 (13%). Kansas had the greatest number of ecological citizens (n = 47) and South Dakota had the fewest (n = 15); however, none of the individual states were significantly different in ecological citizen proportions, X^2 = 1.349, p = .853. The ecological citizens that I found in this study range in age from 21 years to older than 60 years, represent all seven political party affiliations, and represent all five political values noted in Chapter 4. They are generally well educated with 91% reported having earned at least a bachelor's degree. Ecological citizens found in this study reported a highly pro-ecological worldview with an average NEP of 83.38 (SD = 9.955) and a high willingness to take environmental action (M = 20.81, SD = 1.593).

In 2011, Jagers surveyed Swedish households and found that nearly 25% of the respondents could be described as ecological citizens through their beliefs, values, and behaviors. Jagers (2011) described the common ecological citizen in their study as an educated young woman between 15 and 29 years old who lived in a large city and identified as a Green Party or Left Party member (p. 32). Jagers (2011) also found that the individual's perception of environmental need was the greatest predictor of the individual's willingness to engage in environmental behavior (p. 33). The ecological citizens described in the current study confirm characteristics found in Jagers' study;

however, there are key differences in how political views and individual perception influenced the respondent's environmental behavior.

Many studies on ecological citizenship posit that it is incompatible with conservative political views, or that to develop ecological citizenship individuals must accept Green Party principles (Melo-Escrihuela, 2015); however, the Green Party is not a leading party in the United States and few state legislatures have any Green Party members, which supports the belief that ecological citizenship could be developed and fostered within any political party and value system. The results of the current study confirm that ecological citizenship can be developed irrespective of the individual's political views and values; however, that confirmation does not hold true for Group 1, which is the most political of the three groups, thereby both confirming and disconfirming Melo-Escrihuela's findings.

No individual in Group 1 with conservative or very conservative values was found to be an ecological citizen, nor were there any Republicans within Group 1 identified as ecological citizens. The absence of conservative or Republican ecological citizens within the state legislative group confirms the assumption that ecological citizenship is a left-leaning ideology (Melo-Escrihuela, 2015); however, if ecological citizenship was incompatible with conservative or Republican values as demonstrated in Group 1, then they should also be absent from Groups 2 and 3. Group 2 has one individual identified as a Strong Republican ecological citizen with very conservative values, and Group 3 included both conservatives and Republicans that were identified as

being an ecological citizen, thereby challenging the confirmation that left-leaning or green political ideologies are required for the development of ecological citizenship.

The development of ecological citizenship relies on the individual's perceptions of connectedness to not only nature, but also their local community and the global community. Guckian, de Young, and Harbo (2017) differentiated between "green consumers" and "green citizens" and found that sample demographics were not significant predictors of ecological citizenship; however, they also found that the motivation for adopting ecological citizenship was intrinsic and associated with the individual's biophilia, while green consumerism was associated with intrinsic feelings of social connection (p. 87). In the current study, I did not differentiate between consumers and citizens, but rather described the respondent's willingness to engage in sustainable consumption and support sustainable development; however, the I did confirm Guckian et al.'s findings that an individual's environmental actions were not predicted by their age, gender, or ethnicity.

Engaging in sustainable consumption, such as using paper, plastic, or reusable bags at the grocery store, is a personal choice. Supporting sustainable development, such as voting for and supporting taxation on environmentally unfriendly behavior or supporting local parks and environmental activities through property tax levies, is also a personal choice; however, as Guckian et al. (2017) noted, "The decades-long mainstream approach has been to focus almost all of the attention on providing people with green consumer choices (e.g., buying green products, shopping at organic stores, using green appliances at home) while ignoring opportunities to encourage green citizenship" (p. 87).

Within the ecological citizen subgroup, 72 respondents (43%) believed that their states offered enough opportunities for residents to engage in environmental activities, thereby confirming Guckian et al's position that, even within the ecological citizen subgroup, there is a certain level of neglect in terms of encouraging ecological citizenship; however, 99 respondents (59%) believed that the state supports partnerships between state agencies and public organizations, which implies that on a professional level, ecological citizenship is encouraged through working relationships that indirectly fosters the development of ecological citizenship, thereby disconfirming Guckian et al's position. On the surface, it appears that political systems within the grasslands encourage ecological citizenship; however, there are marked differences in support based on the type of encouragement and behavior being requested.

Types of encouragement explored throughout the current study included paying individuals for environmental behavior, taxing polluters, social pressure, and social guilt. Receiving payment for environmental behavior has been discussed in many studies (e.g., Jayachandran et al., 2017; Kerr, Lapinski, Liu, & Zhou, 2017; Seyfang, 2016; Whillans & Dunn, 2015), but as Whillans and Dunn (2015) found, "individuals who were paid by the hour—making the economic value of time chronically salient—were less likely to engage in a broad range of environmental behaviors" (p. 48); however, Maki, Burns, Ha, and Rothman (2016) found that once individuals began receiving payment for environmental behaviors, they continued those behaviors after payments ceased which suggests that, for some individuals, ecological citizenship can be encouraged through financial means, but

the effect of short-term financial incentives on long-term environmental behavior is small to moderate.

Many states have state funded programs that pay residents to plant native plants to help the local environment; however, participation rates for these programs are often low which decreases the program's effectiveness. Studies conducted in other countries, however, found that paying for environmental behaviors can reverse deforestation and improve local biodiversity when the program has full support of the political system (e.g., Jayachandran, et al., 2017). Kolinjivadi et al. (2017) argued that paying for environmental behaviors is a "neoliberal performative" that places economic values on nature (p. 16). Exploring the idea that paying for environmental behavior, and thereby fostering ecological citizenship, is an act of neoliberalism is outside the scope of the current study; however, the current study found that 69 of the 119 identified Democrat ecological citizens and 4 of the 15 identified Republican ecological citizens do not believe that residents should be paid for environmental behavior, thereby disconfirming Kolinjinadi's position; however further inquiry into the political influence on the acceptance or rejection of payment for environmental services is warranted as the current study found a greater proportion of Republicans believe that residents should be paid for environmental behavior, which negates the neoliberalism connection. The current study also found that the position of not supporting paying residents for environmental behavior was nearly evenly split between Liberal (56%) and Conservative (50%) values.

As with Guckian et al.'s study, the current study included individuals who work closely with environmental issues which can produce results that may not be reflective of

the general population, but unlike Guckian et al.'s study, the results of the current study do not suggest a preexisting support for financial incentives. In fact, 47 respondents from Group 2 (52%) do not believe that residents should be paid for environmental behavior, even though this group works directly with state legislators and state agencies to develop the state's SWAP and incentive programs, and 38 respondents from Group 3 (60%) also do not believe that residents should be paid for environmental behavior; however, some respondents view entities in Group 3 as "only being interested in the environment to increase profits through paid memberships". These results challenge Guckian et al's assumption that the public do not hold the same position solely based on the respondent's employment choices. One possible explanation for the shared belief that residents should not be paid for engaging in environmental behavior may be attributable to the public perception "that the government has assumed responsibility for protecting the environment" (Turaga et al., 2000, p. 221) through the creation of financial incentives themselves and payments serve only to reward selected individuals. The perceived separation of residents based on support for agriculture or oil was found throughout the qualitative responses provided in the current study.

The implications for these findings are far reaching. First, the ecological citizens subgroup identified in the current study are in positions to both directly and indirectly influence the development of ecological citizenship within their states, and while the willingness to convince others to take action is present, the majority of ecological citizen respondents are selective in how they choose to convince others to act on behalf of the environment. This reluctance can impact policy development, program development, and

promotion of existing policies and programs. Second, the non-collective willingness to support financial incentives for environmental behavior creates conflict within the system that must work in unison to meet the needs of both human residents and the natural environment. In the current study, 80% of ecological citizen respondents believed that meeting environmental needs is best served through partnerships between states and organizations, yet there is no consensus on how to promote environmental behavior. Lack of a consensus imposes limitations on the effectiveness of current policies and environmental programs. Direct financial incentive one method of directly encouraging positive environmental behavior within a community. The current study also explored one method of encouraging positive environmental behavior through punishing negative environmental behavior.

In the current study, I found that nearly all the 168 ecological citizen respondents support the taxation or fining of environmental polluters to correct the harm done to the environment. Pollution taxation is one aspect of environmental justice, which is a key component to ecological citizenship. Closely linked with social justice and equal rights, environmental justice often focuses on individual rights and how those rights are impacted by externalities; however, as Middlemiss (2010) noted, "there is a considerably greater emphasis on rights rather than responsibility in much work on environmental justice" (p. 155). Middlemiss (2010) highlighted the ecological citizen's responsibility to "act within environmental limits" (p. 157); however, this responsibility is constrained by four capacities: cultural, organizational, infrastructural, and personal (p. 160).

Cultural norms and values limit the actions of individuals based on perceived responsibility toward that action (Jagers et al., 2014; Lummis et al., 2016). In the current study, it could be assumed that the ecological citizen subgroup has a shared cultural norm and value system that fostered individual ecological citizenship development; however, the willingness to engage in environmental behaviors is not uniform within the subgroup. For example, 24 respondents (21%) would be somewhat willing or not willing at all to carpool, which implies a decreased sense of individual responsibility toward their ecological footprint. In the United States driving is often viewed as a right, rather than a privilege, which could account for the decrease in individual responsibility; however, 42 respondents (36%) would also be somewhat willing or not willing at all to pay a $0.50 surcharge on gas to toward greenhouse gas reduction, which further decreases the perceived individual responsibility of an ecological citizen to reduce one's carbon footprint. These results suggest that while ecological citizenship does possess a high regard for environmental justice, the actions of ecological citizens can display opposing norms and values as the lack of willingness to reduce the number of cars on the road generates pollution that impacts the whole community, rather than just the individual.

Organizational "resources for sustainability offered by the organizations that a person is connected with" (Middlemiss, 2010, p. 160) can assist or hinder the development of ecological citizenship. In terms of the current study, organizational resources can include citizen science opportunities and courses offered through local colleges and universities, lobbying efforts of environmental organizations, and sustainable development goals. Infrastructural resources are "facilities for sustainable

living which a person can access" (Middlemiss, 2010, p. 160) and are often provided by the government or organizations, such as local parks, recycling plants, or classroom space for master gardening classes. Organizational and infrastructural resources provided the interaction necessary to develop ecological citizenship; however, access to these resources can be limited based on the individual's location, income, mobility, and education.

Local parks can provide free access to nature but can also be viewed as a dangerous place because of other social issues such as homelessness and drug usage (McCord & Houser, 2017; Rader et al., 2015), which can decrease the use of the park by families, thereby diminishing the early development and fostering of biophilia. Organizational resources, such as master gardening classes or activities for paid members, are often out of reach for those on limited incomes or limited mobility. Resources offered by both the government and organizations was viewed as catering to a select group of individuals while ignoring the needs of the whole community. As one respondent commented, "the 'so-called' environmental groups are nothing more than paid hunting clubs that are supported by legislative members and the conservation work of others". Other respondents commented that charging a membership fee to watch birds was "unethical" and served "nothing but the organization's bank account". With 50% of the ecological citizen subgroup believing that there are ample opportunities to engage in environmental behavior, yet only 35% believe that there is equitable access to natural resources, there is a clear and distinct gap between perceived organizational and infrastructural resources.

The last capacity identified by Middlemiss (2010) was the personal capacity, or "the person's resources for sustainability" (p. 160), which includes education, finances, and mobility. Finances and mobility were briefly discussed in terms of how the government and organizations use these finite resources to intentionally, or unintentionally, limit environmental engagement to those with expendable personal resources or uninhibited mobility; however, personal capacity is a clear embodiment of the bioecological model and the multi-generational aspect of ecological citizenship. Several items in the current study related to personal resources that could be used by the identified ecological citizens to further foster its development within their community; however, the results were mixed in terms of support based on the respondent's group.

As noted earlier, the ecological citizen subgroup is well-educated, but the current study did not inquire as to what major or type of education the respondent obtained, which created a gap that may have affected the results if the respondent's education was environmentally focused. How a person chooses to use their personal resources can also indicate their position and support for sustainable consumption and development based on the perceived individual's responsibility to their local community, the global community, and the environment. In the current study, 78% of respondents agreed to some degree that the Earth has limited space and natural resources, and 98% of respondents believed that grasslands' environmental health was the shared responsibility of the government, landowners, agencies, and communities within the region. Over 80% of respondents who clarified their view on equitable access to natural resources noted that the majority of their states was privately owned and "it should not be assumed that

property owners would welcome visitors on their property to look at birds and butterflies".

The shared responsibility for limited resources implies the respondents actively practice sustainable consumption and support sustainable development; however, the results of the current study suggests that shared responsibility applies only to local needs, which violates the nonreciprocal responsibility and unbounded responsibility factors of ecological citizenship. Nearly 42% of the ecological citizen respondents do not believe that goods purchased in the United States negatively impacts the environment in other countries even though 90% of respondents believe that consumers are obligated to consider future generations when making purchases. Studies conducted over the last 15 years have found a strong relationship between U.S. imports and increased carbon dioxide emissions in other countries (e.g., Prell, Feng, Sun, Geores, & Hubacek, 2014; Stretesky & Lynch, 2009), which further supports the need for ecological citizenship that practices sustainable consumption and development.

I found that all respondents in the ecological citizen subgroup within each group were at least somewhat willing to stop buying bottled water, use recycled bags at the grocery store, and to plant native plants to restore the grasslands; however, these actions are passive and often individually motivated rather than motivated through communal need for a cleaner environment. These actions, however, can also lead to others engaging in the same behavior through a sense of social guilt or social collective action (Bissing-Olson et al., 2016; Dresner et al., 2015; Hausmann et al., 2015).

In the current study, 27 ecological citizen respondents (3 from Group 1, 24 from Groups 2 and 3) feel that the state government pressures residents to engage in environmental behavior, which confirms Kolinjivadi et al.'s position that ecological citizenship can be viewed as a neoliberal performative. Thirty-two ecological citizen respondents (1 from Group 1, 31 from Groups 2 and 3) believe that organizations make residents feel guilty if they do not participate in environmental activities which confirms Dresner et al.'s findings. Guilt, and feelings of pressure to act environmentally, has a positive effect on environmental behavior when there is "high environmental concern", but has a negative effect on those with "low environmental concern (Wonneberger, 2017). Providing resources and opportunities to foster ecological citizenship would improve its development rather than treating the environment as if it were another cause to be championed. As one respondent noted, "If I want to participate, I can, but I should be allowed to not participate".

The current study confirmed many assumptions and previous findings on ecological citizenship, but also found that those confirmations were limited in scope and often applicable to only one group. Ecological citizens do exist within the political system of the U.S. grasslands. This finding can now be applied to the bioecological model to determine how the exosystem can use its direct and indirect influence on the individual to develop and foster ecological citizenship, but first results of the current study's research questions must be examined further to determine the full extent of that influence. Previous studies on political systems and the development of ecological citizenship was limited, and the current study provides a stepping stone for future

research that will aid in understanding the relationship between individual ecological citizenship and political systems.

Research Question 1: State Legislators and Ecological Citizenship

The results of a Pearson correlation test on Group 1's *NEP* and *WTTA* indicated there is a strong positive relationship between the state legislator's environmental worldview and their individual willingness to engage in selected environmental behaviors, $r(117) = .784$, $p < .05$. Results of a linear regression analysis, $\beta = .185$, $p < .05$, $R^2 = .61$, indicated that the state legislator's environmental worldview significantly predicted their willingness to take action. The null hypothesis, that there is no significant relationship between a state legislator's environmental worldview and their willingness to take action, was rejected. As a state legislator in the five states included in the current study adopts a pro-ecological worldview, their willingness to personally engage in environmental behavior increases. As there have been no other studies found that directly explored the relationship between state legislator's pro-ecological worldview and ecological citizenship, the current study provides a starting point for future studies.

Seyfang (2007) noted that ecological citizenship, if left to the public, will not be actively developed, but rather ecological citizenship development, and sustainable community development, requires an active government pursuing the requisite changes in social constructs that promote ecological individual behavior and the acceptance of grassroots environmental movements in policy development. Chan et al. (2016), Dobson (2009), and Dresner et al. (2015) all noted that governmental supported changes in social norms and values are drivers of ecological citizenship development. State legislators and

agents, state organization partnership directors and staff, and NGO directors and staff, create a network of decision makers that have the power to influence individual behavior and promote social change.

Ecological citizens think and act locally and globally, demonstrate proenvironmental behavior, participate in environmental political processes, and believe that today's actions impact future generations (Bell, 2005; Dobson, 2003; Melo-Escrihuela, 2008; Schild, 2016). While the previous section identified 15 state legislators that could be defined as ecological citizens, the entire group has direct and in-direct influence on the development and fostering of ecological citizenship within their states. Of the 117 state legislators who participated in the current study, 72% reported a pro-ecological worldview. The significance of the level of state legislators who endorse a pro-ecological worldview implies that the state legislative bodies in the five-state region would be supportive of environmental policy and programs; however, 50% of the respondents do not believe that the Earth's resources are limited and 43% believe that the ecological crisis has been greatly exaggerated, which indicates a gap between overall worldview and select environmental needs.

As state lawmakers, the respondents can indirectly influence the development and fostering of ecological citizenship within their states. First, as Bronfenbrenner and Ceci (1994) noted, an individual's experiences are indirectly shaped by the exosystem, and state legislators are one entity within the exosystem. State legislators can create laws that prohibit the use of plastic grocery bags, which will require the use of other grocery bag options. Second, as individuals and as a group, state legislators can indirectly influence

the development and fostering of ecological citizenship through changes in the macrosystem. Changes in public policy that promote early development of ecological citizenship can negate the need for direct public policy regarding environmental behavior. For example, increased environmental education can improve awareness of how plastic use impacts the environment, which will indirectly promote the use of recycled bags without the need for direct legislation guiding future generations.

The current study measured the respondent's ecological worldview which is developed through the individual respondent's experiences, but the first research question focused on how state legislators and agents used those personal experiences to develop and foster ecological citizenship in others. Only 24 respondents were not willing at all to stop using plastic grocery sacks and use recycled bags, which implies a certain developed concern for the environment, but only 29 state legislators are willing to encourage others to use recycled bags at the grocery store. These results indicate a general acceptance of personal responsibility, but also a general unwillingness to impose their view on others.

The reluctance to impose personal views of environmental behaviors on others was found in all aspects of the current study except for planting native plants. This reluctance could hinder the development of ecological citizenship within their states through not fully supporting legislation that funds or promotes opportunities to engage with nature. As several state legislators noted, the states included in the current study are primarily privately owned, and it is not the right of the state to tell landowners "they must allow tree huggers" on their property, nor is it the responsibility of the state "to bus people from the city to visit a state park".

The perception that it is not the government's responsibility to facilitate environmental interaction within their states was contradictory to the group's general belief that state-based conservation efforts are dependent on public support; however, this contradiction is felt within the state organization partnerships that help created the state wildlife action plans that encourage public participation and partnership with state agencies and organizations. As many respondents in Group 2 and 3 noted, "the state government serves only agriculture and big oil". These two sectors are secure in private landownership, which shifts environmental responsibility from the state to state-based partnerships and environmental organizations. These two groups also have the closest relationship with the public and increased opportunities to develop and foster ecological citizenship within the region.

Research Question 2: State Organization Partnerships and Ecological Citizenship

The results of a Pearson correlation test on Group 2's *NEP* and *WTTA* indicated there is a significant moderately positive relationship between a state organization director and staff's environmental worldview and their individual willingness to engage in selected environmental behaviors, $r(328) = .569$, $p < .05$. Results of a linear regression analysis, $\beta = .145$, $p < .05$, $R^2 = .32$, indicated that the director and staff's environmental worldview significantly predicted their willingness to take action. The null hypothesis, that there is no significant relationship between a state organization partnership director and staff's environmental worldview and their willingness to take action, was rejected.

The state organization partnership director and staff's environmental worldview only accounted for 32% of the variation in their willingness to engage in selected

environmental behaviors, so a multiple linear regression test was conducted to determine if any demographics also significantly predicted their willingness to engage in environmental behavior. The results of the additional regression testing indicated that the director and staff's political values and age were also significant predictors; however, both indicated a negative predictive effect. As the director or staff member of a state organization partnership ages, they are less willing to engage in environmental behavior. Like with Group 1, very little research has focused on the role of individuals, agencies, and organizations that assisted in the development of their respective state wildlife action plans and their perceived role in the development and fostering of ecological citizenship within their states; however, the results of the current study for state organization partnership directors and staff can be interpreted through the state wildlife action plan that served to identify potential participants in the current study.

Group 2 was the largest group in the current study with 328 respondents and reported the greatest percentage of respondents who endorse the new ecological paradigm with only 7 respondents supporting the dominant social paradigm. There were many interesting findings within this group. First, even though there is a high level of *NEP* endorsement, only 27% reported a high willingness to engage in environmental behavior and convince others to do the same. Second, 46 respondents (14%) do not believe that conservation in the grasslands is best served through the very partnership they created; however, 97% of the group believe that the grasslands' ecological health is a shared responsibility. Third, there is a large amount of opposing views within the group

regarding resources and ecological health. Lastly, many respondents question the perceived value of state organization partnerships.

State organization partnerships are presented in four of the five states' wildlife action plans as highly valued and necessary components of state-based conservation efforts. Nebraska views its SWAP as a way to create "new opportunities for collaboration between farmers, ranchers, communities, private and governmental organizations and others for conserving Nebraska's biological diversity, our natural heritage" (Schneider et al., 2011, p. 2) and acknowledges these partnerships before beginning their SWAP. North Dakota acknowledged the invaluable resource that state organizations provide when developing their state SWAP and "recognized the scope and magnitude of these endeavors and embraced the need to coordinate efforts with partners and solicit their input" (Dyke et al., 2015, p. 2). South Dakota "encourages voluntary partnerships among governmental entities, tribes, organizations, and private citizens to help prevent fish and wildlife from becoming endangered and to provide … wildlife and habitat diversity for the future sustained enjoyment and use …" (South Dakota Department of Game, Fish, and Parks, 2014, p. viii). Kansas "continues to collaborate with our conservation partners in academia and other state/federal agencies" and acknowledges that "The feedback and assistance from these groups, their willingness to participate in all aspects of the plan revision, and overall support is outstanding", which allows the state SWAP to be effective in identifying and monitoring the conservation needs of the state (Rohweder, 2015, p. iii).

While creating state organization partnerships is a congressional requirement for receiving federal funds for conservation, only Iowa presented these partnerships as a mere requirement, rather than a fully integrated and essential component of state-based conservation. The Iowa SWAP did identify individuals and organizations that served as "either as members of committees or as consultants and reviewers of specific portions of the IWAP" (Zohrer, 2015, p. 5) which allowed me to invite these partners to participate in the current study. The way state SWAPs present their partnerships with environmental organizations and experts may contribute to the lack of enthusiasm for the partnership as reported by many respondents in Group 2. To prevent unintentionally identifying individuals who participated in the current study, the respondent's state will not be identified in this discussion.

Goals of every state SWAP include identifying current ecological need, postulating future ecological need, and identifying strategies for state agencies, organizations, and the public so that these needs can be met. Congress established these goals and element 7 relates to partnerships between the state, tribes, and organizations (Schneider et al., 2011). The state SWAPs involved in the current study all indicate that the state has limited resources that must be conserved for future generations. This sentiment is generally well supported by members of the partnership. The current study found that only 21% believe that the ecological crisis has been exaggerated and 67% believe that the Earth has limited room and resources. It is important to note that nearly twice as many state organization partners than state legislators believe the state has

limited resources. With limited resources and high private land ownership, partnerships are vital to the ecological health of the region.

Nebraska's SWAP stated it should "Strive for shared responsibility between landowners, agencies, organizations, and communities" (Schneider et al., 2011, p. 31) and North Dakota's SWAP stated, "large number of partners shows the strength of the state's SWAP by demonstrating the buy-in by not only NDGFD staff but our partners across the fish and wildlife community" (Dyke et al., 2015, p. 135), which implies the state supports a shared governance and responsibility toward protecting the limited resources that is best achieved through working partnerships. This is confirmed through responses from all groups with 93% of all respondents agreeing to some degree that environmental health is a shared responsibility of landowners, agencies, organizations, and communities within the region; however, the shared responsibility can be viewed as a collection of individual activity, such as using recycled bags, or as a communal activity, such as paying a surcharge on gasoline.

The current study found that while the state SWAPs promote an ideal communal approach, many respondents capable of influencing others through their partnership with the state perceive environmental behavior as an individual activity. Only six respondents were not willing to use recycled bags while shopping, which indicated a general concern for the environment and acceptance of individual responsibility in terms of sustainable consumption; however, only 29% of respondents indicated a willingness to convince others to endorse sustainable consumption. Sustainable consumption, and the public's need to modify individual behavior, was noted in each of the state SWAPs included in the

current study. The lack of willingness to encourage others to participate in sustainable consumption may be the result of personal perceptions of what convincing others means. For example, when responding to the open-ended questions in the current study, several respondents noted that "libtards are always telling us what to do" and that "no state should force residents to behave environmentally". Developing and fostering ecological citizenship on a personal level does not require legislation, but rather personal influences through direct and indirect methods. Each state SWAP noted the need for increased environmental education, which was also noted by several respondents.

Supporting sustainable development endorses the communal approach to shared responsibility; however, 32% of the respondents indicated they would be unwilling to pay a $0.50 surcharge on gasoline to go toward greenhouse gas reduction, but 91% indicated they would be willing to carpool. None of the state SWAPs addressed the effect of individual behaviors on the environmental health of the region, which minimizes the available influence of state organization partnerships on the development and fostering of ecological citizenship. The need for public participation is noted in the state SWAPs, but in conjunction with the partnerships and non-partnering organizations; thereby leaving the state out of encouraging the communal response without the need for additional legislation. Increases in environmental legislation can lead individuals to believe "that the government has assumed responsibility for protecting the environment" (Turaga et al., 2000, p. 221).

As noted earlier, every state SWAP requires state organization partnerships and public participation, but not all respondents in these partnerships believe the partnership

or participation is valued or best serves the environmental needs of the state. Only 86 to 88% of the respondents answered the open-ended questions regarding their perception of public participation and partnerships; however, 70% indicated they believe state organization partnerships promote public participation and 51% believed that these partnerships offer enough opportunities for public participation. The Kansas, South Dakota, and Nebraska SWAPs stressed communication between the state and partners, but as one respondent noted, "most environmental policies are only influenced by state outreach agencies, while actual polices are decided by the legislation branches without full intent of the state outreach agencies". The value of the partnership in assisting the state government was also questioned by other respondents who noted state legislators and agencies "provide lip service" and "only listen to big ag and money". Many respondents expressed feelings of "working against the tide" when describing the state organization partnership.

Respondents in Group 2 expressed an even wider range of opinions on whether the state, state organization partnerships, and environmental organizations promote public participation. All state SWAPS indicated it was created with public input; however, some respondents questioned the value and necessity of such input. One respondent noted, "Many of our citizens are low functioning peasants that predisposes them to squander resources than complain when they are used up", and several respondents remarked on the level of public knowledge as they "wouldn't know the difference between a prairie dog and a pit bull" and "people only know what Fox News tells them". This view of the public was not shared by the entire group, but several respondents did

note that the public's perceived level of environmental knowledge was lacking. One respondent noted, however, that even though they work for a state organization partner, "as a citizen, I do not feel my voice matters, so I do not attend public meetings". This perception of not being heard was not addressed in the current study but may explain the general lack of willingness to convince others to engage in ecological citizenship.

Research Question 3: NGOs and Ecological Citizenship

The results of a Pearson correlation test on Group 3's *NEP* and *WTTA* indicated there is a significant moderately positive relationship between the respondent's environmental worldview and their individual willingness to engage in selected environmental behaviors, $r(237) = .613$, $p < .05$. Results of the linear regression test indicated that the NGO administrator and staff's environmental worldview significantly predicted their willingness to take action, $\beta = .143$, $p < .05$, $R^2 = .38$. The null hypothesis that there was no significant relationship between NGO administrator and staff's environmental worldview and their willingness to take action was rejected. The NGO director and staff's environmental worldview accounts for 38% of the variation in their willingness to engage in selected environmental behaviors, and results of a multiple linear regression indicated that the respondent's political party affiliation also predicted their willingness to engage in environmental behavior. Like Groups 1 and 2, there are few studies that have explicitly explored the development of ecological citizenship within the NGO sector, rather many studies have focused on the opportunities available within the sector that contribute to internal environmental beliefs and individual behavior (Kobori et al., 2016; Schwartz et al., 2013; Soranno et al., 2015).

Kollmuss and Agyeman (2002) noted that potential barriers to proenvironmental behavior include institutional barriers created through institutional decisions. Forrester et al. (2016) and Lewandowski and Oberhauser (2015) found that opportunities provided by NGOs increased proenvironmental behavior by providing the social opportunities needed to foster internal behavioral change; however, institutional decisions influence the opportunities available to the public. In the current study, the perception that NGOs offered enough opportunities to participate in environmental activities was evenly split. State legislators pass environmental legislation, state organization partnerships establish goals for the community through the state SWAP, and NGOs work directly with the public to achieve those goals. If individuals within the NGO sector itself have doubts about its opportunities, then the development and fostering of ecological citizenship can be hindered.

The current study confirms some of Kollmuss and Agyeman's barriers to proenvironmental behavior. Many respondents noted that it is not the lack of opportunities that is hindering the development of ecological citizenship, but rather the lack of environmental knowledge and interest that prevents residents from participating in provided opportunities. Nearly 35% of the respondents who expanded on their responses noted that environmental education in their public schools were lacking, and one respondent noted that stewardship classes should also be offered. Interestingly many respondents in Group 3 were the most critical of residents in their states. As one respondent noted, "Most people are too busy watching Husker football and shopping at WalMart to worry about the environment", and another remarked that "activism

especially on environmental issues is considered 'radical.' Also, people are afraid to expose themselves in fear of retaliation. Retaliation or ridicule is also quite common". One respondent summarized the sentiment expressed by many respondents when they noted, "it depends on the individuals. If they CARE about the environmental activities there are definitely ways to be involved and participate in a wide variety of activities and organizations". These responses provide a counter perspective of potential participants than Dresner et al. found in their study, which suggests there is a regional or cultural influence that also affects participation in environmental activities.

Respondents in Group 3 were also highly critical of other NGOs. The current study included large, multi-state organizations and small, local organizations which may account for some of the variation in perspectives. Many respondents remarked on the financial aspect of opportunities offered by NGOs and blamed "high dues" and "penny pinching" organizations for the lack of participation. Some respondents implied that organizations only looked for "their kind of people" to participate, while one respondent noted that "if you are of a minority you have an easier shot at being accepted for certain programs because we want the diversity", which rejects the inclusive nature of ecological citizenship. Perceived racial bias in institutional offerings were not identified in Kollmuss and Agyeman's study but may affect the group's role in the development and fostering of ecological citizenship.

A few respondents were critical of environmental policy itself and placed the lack of participation and opportunity as a result of governmental action. One respondent noted that there were ample opportunities "provided that they show transparency when it

comes to the burden(s) imposed by some failed environmental regulations (federal) enacted in the 1960's that gave too much power & government over-reach to the US Fish & Wildlife Service & the EPA to name a few" and that "The poster child of failed federal environmental reg. programs is the Endangered Species Act!". Several respondents noted that the state government pays landowners through cost-sharing programs, similar to the Chickadee program in Kansas, which politicizes the environment and implies that "only agricultural individuals and companies are heard" by the state. The current study found that 53% of respondents in Group 3 do not agree with paying residents to engage in environmental behavior, which may explain the animosity expressed by some respondents toward state-based environmental services programs; however, this relationship was not explored further in the current study.

A theme developed in the open-ended responses in Group 3 that was not present in the other two groups. NGOs often rely on donations and volunteers to achieve the organization's goals, and many respondents noted both the financial limitations of their organization and low funding support from the state. These are both institutional barriers that may discourage the development and fostering of ecological citizenship within their states. One respondent noted, "If the public is paying CRP payments to a person for personal gain there should be access to the public" and another supported this idea that once payment is received, then the land should be open to the public; however, the majority of respondents firmly support private landownership without governmental interference. Many respondents who identified their organization as being an NGO that provides educational opportunities noted that they simply do not have the finances

necessary to expand their services. These institutional limitations have a direct impact on the development of ecological citizenship. As Dobson (2003) stated, ecological citizens "will avail themselves of the opportunities for collective action with which political systems present them" (p. 103) and these opportunities for collective action are severely limited without support from the government or public.

Bioecological Model and Ecological Citizenship Development

The findings discussed so far have focused on individual groups and the ecological citizen subgroup. Development and fostering of behavioral changes from the exosystem can be accomplished through supporting changes in the communal norms and values found in the macrosystem, or through the mesosystem that directly and indirectly influences individual development. This section begins by interpreting the results of the current study in relation to the perceived role of the political system in the development and fostering of ecological citizenship through changes in the macrosystem and concludes with an interpretation of the results in relation to the perceived role of the political system through direct and indirect influence within the mesosystem.

Hill et al. (2015) noted that vulnerable ecosystems can be protected, and carbon footprints reduced, when political systems promote environmentally friendly behavior by supporting environmental social movements rather than eliciting behavior through laws and regulations. The current study did not explicitly uncover the respondent's views on environmental social movements; however, the responses of the open-ended questions shed some light on the perceived value of current environmental social movements. Many respondents used words that denote a negative perception of environmental social

movements and individuals who support such movements. As one respondent noted, "environmentalists are just tree-hugging liberals with too much time on their hands" and another referred to environmental activists as "women who can't get a man." Several respondents, and invited individuals who declined to participate, politicized the current study and noted that "too many democrats and liberals already try to dictate our lives" and one respondent even took the opportunity to use the open-response option to note, "Your questions still indicate to me that you are a socialist dreamer." The presence of politically based responses in all three groups was anticipated because of the nature of the study, but the lack of support for changes in social values and norms was not previously found in the literature. Many environmental policies during the 1970s were the direct result of changes in social norms and values. The results of the current study challenge the willingness of the exosystem to foster changes in the macrosystem that would decrease the need for more regulations, which implies individuals working in the exosystem may prefer more direct methods of eliciting social change.

The exosystem can directly influence individual behavior though public policy and program offerings. Chapter 4 discussed findings related to the respondent's willingness to take action and, as already discussed in Chapter 4 and 5, this willingness does not generally extend to convincing others to take action. Human development, according to Bronfenbrenner and Ceci (1994), requires a series of increasingly complex interactions between individuals and their environment. Many respondents noted that the opportunities are there for those who want to participate and, in some larger or wealthier communities, opportunities for youth within their schools; however, as Schüle, Gabriel,

and Bolte (2017) found, low socioeconomic neighborhoods faced decreasing public greenspace which negatively impacts the neighborhood's health and well-being, and Chen and Chang (2015) found that inequity was caused not by socioeconomic status of the neighborhood, but was caused by inequitable access to public greenspace caused by lack of transportation. The mixed opinion regarding the level of opportunities provided by the state government, state organization partnerships, and NGOs supported the multiple findings regarding public access in that each community faces its own set of barriers that impact the individual's development of ecological citizenship; however, without having a well-implemented and accepted joint approach for providing and ensuring inclusive environmental engagement, individual willingness to take action will not foster ecological citizenship effectively.

A key document produced within the exosystem is the state's SWAP. The state SWAP represents a pathway for the exosystem to develop and foster ecological citizenship through the mesosystem, and directly through the microsystem. For example, the Nebraska SWAP recognizes that "implementation of a state wildlife action plan requires the cooperative efforts of a wide range of governmental entities, private organizations and citizens. Partnerships and cooperative arrangements can be used to promote collaboration and communication" (Schneider et al., 2011, p. 30) and serves as an excellent example of how exosystem entities can promote cooperation that will foster the development of ecological citizenship. Schneider et al. (2011) identified 12 actions that are needed to promote collaboration and communication, thereby fostering environmental behavior within the community:

1. Support existing and develop new regional forums that include diverse representation from landowners, agencies, private organizations and others that facilitate the exchange of ideas, promote networking, and engage in problem-solving to address issues related to endangered species management, public lands ownership and management, landowner confidentiality, private property rights, etc. Present Natural Legacy information at various forum meetings. Distribute local contact information and address concerns by conducting seminars, workshops, and social functions that promote communication, cooperation and the exchange of ideas.
2. Develop and widely distribute clear and concise publications about conservation programs, stresses to biological diversity, and actions needed to conserve biological diversity. Make it widely available in printed and electronic formats.
3. Regularly inform the public of proposed initiatives, management actions, policy changes, and conservation successes and failures through public meetings, workshops, field trips, one-on-one meetings, seminars, presentations at stakeholder meetings, media, and other effective venues.
4. Develop and implement recognition and appreciation programs to acknowledge the efforts of farmers, ranchers, acreage owners, organizations, community leaders, and others who demonstrate meritorious achievement in the conservation of biological diversity.
5. Design and conduct training programs that instruct conservation practitioners and others in effective public participation techniques.

6. Strive for shared responsibility between landowners, agencies, organizations, and communities when implementing the Nebraska Natural Legacy Project.
7. Institute a citizen-science and education initiative that draws on volunteers of all ages to assist with monitoring, research, stewardship, and education of natural habitats and wildlife. Opportunities are available with existing programs (e.g., Master Naturalist, Adopt-A-Stream, Project FeederWatch) and should be supported.
8. Improve existing and establish new communication channels among conservation practitioners and their agencies/organizations to improve coordination, reduce conflicting and confusing messages conveyed to the public, and to develop a shared vision for the conservation of biological diversity.
9. Facilitate conservation projects by communicating information about possible funding sources, trained contractors, and resources such as native seed suppliers. Encourage involvement in conservation programs, particularly featuring acres where producers are experiencing a decreased profit margin. In many cases, producers may realize no net loss from their participation in conservation programs.
10. Seek opportunities to facilitate understanding and collaboration between the rural and urban publics.
11. Establish networks between public land managers and neighboring private landowners to improve communication, increase respect, and build trust.

12. Look for opportunities to collaborate with bordering states to develop and implement conservation strategies for Biologically Unique Landscapes that truncate Nebraska state lines (p. 31).

Each of these 12 items, create opportunities for individuals to connect within the mesosystem that can be taken back to their homes, neighborhoods, and workplaces that can then influence others to engage in the same behavior. The stronger the collaboration and partnership is within the exosystem, the more communal values can change without the need for further government policy. The Nebraska SWAP demonstrates a common theme found within most literature on environmental behavior: public policy can produce forced temporary change (Agyeman & Evans, 2006; Barry, 2006; Dobson, 2003), but only changes in personal values and ethics is permanent (Francis & Si, 2015; McShane, 2014). These personal changes are the result of effective communication, partnership, and collaboration between all systems of the bioecological model.

Limitations of the Study

Chapter 1 presented limitations of the study conceived before the study was conducted including: low participation rate, incomplete data, access to target population, and inability to determine if the respondent was providing truthful responses. These limitations were addressed prior to conducting the study through increasing the sample size in anticipation of low participation rates, identifying missing data through SPSS and remove the survey if too much data was missing, and assuming the respondent would be honest in their responses. Since the current study was conducted completely online and anonymously, there was no reason to assume the participant would lie, and the results

imply that the majority, if not all, of the respondents provided honest responses. There was one limitation identified in Chapter 1, access to target population, that could not be mitigated, and, in fact, was amplified because of the timing of the study. Many state legislators were not available to participate in the study because the state legislative session had ended before the study was conducted. Several limitations of the current study were discovered while conducting the study and analyzing the data.

One limitation that was not considered prior to conducting the study was the effect of my perceived political views and values. Several invited participants inquired about my political party affiliation, voting district, and state of residence. One invited participant even requested I provide my voting record before they would consider participating in the study. This limitation was not mitigated during the current study, but rather discussed in Chapter 4 as a possible reason for low participation rates for Group 1.

Several items on the survey in the current study were found to have low reliability scores, which created another unforeseen limitation. Items pertaining to the public/private demarcation, $\alpha = .30$, and non-reciprocal responsibility, $\alpha = .32$, were removed during data analysis which prevented an in-depth analysis of the individual factors of ecological citizenship. By removing these items however, the overall reliability and validity of the study was maintained.

The last limitation not considered prior to conducting the study arose from the results of the survey. While it was assumed that the respondents would be truthful in their responses, understanding the relationship between the respondent and their perceived role in the development of ecological citizenship was not as simple as a Likert-

scaled response. Not having a qualitative response to clarify the respondent's position on individual factors of the *NEP*, further reasoning for their *WTTA* responses, and not identifying the respondent's degree field limited the inferences that could be made regarding the data.

Recommendations

Chapter 2 highlighted the many gaps in what is known about the development and fostering of ecological citizenship, and this study aimed to begin filling one gap by focusing on the perceived role of the political system in ecological citizenship development by individuals within the political system of the U.S. grasslands. The results of the current study confirmed the findings of many other studies that found an individual's environmental worldview can, in some cases, predict proenvironmental behavior; however, the current study also identified new gaps in ecological citizenship development within the political system. The following are recommendations for future study to address new gaps and limitations identified in the current study:

1. Future studies on the development and fostering of ecological citizenship in the U.S. grasslands, or any other geographic region, would be best addressed through a mixed-method approach. Quantitative approaches, such as the current study, allow for identification of the relationship and predictive nature of variables, but without the respondent's reasoning for the provided responses, the study is limited in its ability to fully understand the relationship between the respondent and ecological citizenship.

2. The inclusion of inquiry regarding the respondent's environmental education would allow for the study to better understand the relationship between education and ecological citizenship. The current study found that identified ecological citizens are college graduates and have high pro-ecological worldviews, but the study was unable to determine if the high pro-ecological worldview was the result of environmental education.
3. Survey or questionnaire items regarding the public/private demarcation and non-reciprocal responsibility aspects of ecological citizenship need to be developed so that future studies can fully explore how political systems address these aspects.
4. The role of sustainable development in the development and fostering of ecological citizenship needs to be studied further as the results of the current study indicated that current methods of paying for environmental services is not supported within the political system, and respondents reported a reluctance to actively participate in sustainable development activities.
5. Results of secondary regression testing discussed in Chapter 4 indicated that, in some groups, political values and party affiliation are also predictors of ecological citizenship. This finding needs to be studied further as none of the respondents in the current identified as a Green Party member which implies ecological citizenship is not dependent on non-traditional political views.
6. The qualitative responses provided by respondents indicated a disconnect between how partnerships are expressed by the state, and how they are perceived by individuals working for those partnerships and other organizations. Individuals

within the partnership perceive it as “on paper only” and not “truly listening to their recommendations”, while individuals outside of the partnership often perceive them as “catering to select groups” rather than the public. Further research is needed to understand this disconnect and how state government can facilitate a working relationship with all environmental engagement providers so that ecological citizenship can be fostered by both the state SWAP and organizational relationships that work both to change public policy and public opinion on environmental needs.

Implications

Chapter 1 briefly discussed the potential implications of the current study; however, the results of the current study have far reaching possibilities beyond what was previously discussed. The results indicated that each of the three groups can benefit from the results of the current study. The body of knowledge on the development of ecological citizenship, and proenvironmental behavior in general, can also benefit from the current study.

Positive Social Change

Creating social change that benefits the environment begins with the individual. The current study may not create change in the entire 5-state region, but if its results can reach one individual from each group, then social change has begun. Several respondents kept in contact throughout the current study and requested the preliminary results when it was available. One respondent in Group 3 requested an in-person meeting with the organization’s board and administration to present the findings along with

recommendations for improving the organization's ability to promote ecological citizenship within their community. Ecological citizenship is multi-generational, and each environmental policy relies on the passing of knowledge to the next generation to be effective. The current study noted weaknesses within each group of respondents that, if addressed within the group, promote positive social change within not only the community, but the state as well. The nature of the study was limited to five states; however, many organizations in Group 2 and Group 3 are national or international organizations which allows for the results of the current study to be examined internally for applicability to other states or countries, which will further increase the possible social change of the current study.

Impact on State Government

The current study included state legislators and agents as a participant group and the results suggest there is great potential for this group in the development and fostering of ecological citizenship within their states; however, there is also great reluctance to use the state government and its resources to fully facilitate its development. Results of the regression analysis for state legislators indicated that 60% of their individual willingness to take action can be predicted by their environmental worldview, but further analysis into the perceived role the government can play in ecological citizenship development indicated that many state legislators view access to nature and environmental engagement opportunities as private matters that are best handled through partnerships and other organizations.

While it is not suggested that a state's government should require private landowners to allow visitors on their property, the state's SWAP inclusion of public participation is negated by the lack of assisting with removing barriers to nature and environmental engagement created by individual limitations. Responses from state organization partners and NGOs imply state legislators view the state SWAP as not pertaining to the government itself, but rather serves as a conservation plan for its agencies; however, improving the strength of the relationship between agencies, NGOs, and the state government will contribute to positive social change through improving biodiversity within the region. Increased biodiversity can improve public health through decreased allergies (Ruokolainen, Fyhrquist, & Haahtela, 2016), increase social connections (Dresner et al., 2015), and even influence career choices (di Fabio & Bucci, 2016). Many respondents in all three groups noted that the state government does not provide enough funding for the development and fostering of ecological citizenship within the state, which further hinders the ability of the state SWAP to engage the public in environmental activities and awareness that will serve to foster ecological citizenship development through changes in social norms and values rather than requiring further environmental public policy.

Impact on State Organization Partnerships

State organization partners, such as the Iowa Wildlife Center and Pheasants Forever, create social change through lobbying efforts and direct intervention within the community through animal rehabilitation, conservation projects, and assisting in the development of the state wildlife action plan. The results of the current study found that

communication within the partnership has left some respondents feeling "left out of the loop" which has created a sense of "selective hearing" on behalf of the partnership. The current study has identified areas where the state organization partnership could be improved. These areas include: communication within the partnership to encourage more institutional and governmental communication and increased dissemination of the state SWAP to all members of the partnership. Several respondents within the state organization partnership group indicated they "have never heard of the state wildlife action plan" and "know a plan was created but have never read it". Without knowing the reason for the partnership and how everyone within the partnership can promote ecological citizenship and environmental behavior within their states, the ability of the SWAP to foster ecological citizenship is limited.

Impact on NGOs

Environmental NGOs, such as the Audubon Society and Ducks Unlimited, currently provide citizen scientist programs and other social opportunities for residents to engage in environmental behavior; however, participation in many programs is low. The responses from individuals associated with environmental NGOs in the current study are divided in their perception of public participation. Some respondents noted many potential participants are left out because of "institutional membership dues", "lack of transportation", and a general lack of "knowing how they can participate". As one respondent remarked, many organizations "say" they want volunteers and public participation but then do nothing to ensure the "word gets out" that the opportunity is available for everyone and not just their target population. The development and

fostering of ecological citizenship requires public participation and the results of the current study indicate that there is a general willingness to participate, but institutional barriers are hindering ecological citizenship development.

To assist state governmental agents and state organization partners in the development and fostering of ecological citizenship, NGO directors and staff must first address the contradictory beliefs within the sector. Results of the current study identified a negative theme that emerged when exploring the NGO's role in the development of ecological citizenship. NGOs are the closest of the three exosystem entities included in this study to the public and have the most ability to effectively promote changes in the social norms and values without the need for new laws and regulations. The results of the current study indicated that while administrators and staff are financially constrained, the majority of respondents believed that the organizations could do more to increase public participation including: posting opportunities in more places, utilizing dues more efficiently, and listening to both staff and community members.

Impact on Public Policy

While all major international and national environmental policies of the 20th and early 21st century were read for the current study, the focus became the congressionally required state-based SWAP. This plan is required to be created and revised every ten years, but many states have opted to revise the plan every five years as to provide more opportunities to identify needs and correct errors made during the implementation of the plan. One required aspect of every plan is the creation of partnerships that aid in the plan's development and promotion of public participation. The five states included in the

current study produced plans that address public participation and partnerships very differently. Nebraska clearly promotes and values partnerships and encourages public participation within the SWAP, which can be adopted by other states within the region when the state revises its SWAP.

The results of the current study indicated that there is a lack of distribution of the state SWAP to agencies, organizations, and the public. While the SWAP can be found online, individuals must know where to look if they are to find it. Improving public awareness of the SWAP, and what its purpose is, can increase participation in environmental activities offered by the partnerships and NGOs, thereby promoting the development of ecological citizenship within the state. The results also indicated that a majority of respondents are concerned about the lack of funding provided for environmental needs. Environmental education within the state school system can promote sustainable consumption and introduce sustainable development to the next generation. The students, however, take this information home to parents and other family members, thereby disseminating the information within microsystem. When parents or family members talk to their neighbors or co-workers, they are also disseminating information on sustainable consumption and development.

By investing in environmental education, beyond compulsory or "token" classes, one policy, such as the SWAP, can effectively ignite social change without the need for further policy. Of the five states included in the current study, only Nebraska directly addresses the role of environmental education in environmental protection and engagement. A 2003 survey of 600 Nebraska residents found that "98% of respondents

think environmental education should be taught in schools" (Bureau of Sociological Research, 2003, "Appendix D"). The Nebraska SWAP recommended environmental education be increased through a variety of means including: "adding environmental education-specific courses or encouraging mentorships with current classroom educators already incorporating environmental education into their curriculum" in teacher education programs, "support existing and develop new programs/partnerships/materials to improve learning opportunities to all age and ability levels", "work with the Nebraska Department of Education to adopt and incorporate the Nebraska Environmental Literacy Plan", and "Work with partners, such as Cooperative Extension, to develop and conduct workshops for landowners, producers, community leaders, conservation practitioners, educators and others on topics such as prairie conservation … forest management, aquatic resources, available costshare programs for projects, etc." (p. 33). These recommendations, if implemented, utilize an existing policy to spur future ecological citizenship development without further policies by using partnerships to spread environmental education through the state through a variety of methods which allows the information to reach a greater number of residents than the SWAP alone. Ecological citizenship is multi-generational and if the state informs and supports ecological citizenship at the youth level, then the state is fostering its development within the whole community provided organizations and partnerships expand their opportunities to be more inclusive, which relies on funding from the state. An efficient SWAP promotes this circular responsibility of both state and organizations so that effective partnerships and policies can be developed.

Impact on Bioecological Model Literature

The results of the current study add to the body of knowledge that used Bronfenbrenner's bioecological model as a framework; however, the current study also highlighted a possible weakness of the model when used to predict the development of ecological citizenship. As noted throughout the study, the bioecological model is not often utilized from an inward perspective. This new perspective helped identify a barrier to the development of ecological citizenship: a general unwillingness to convince others to engage in environmental behavior. An individual possesses a certain level of biophilia that wans as the individual ages, but can be rekindled through social interaction; however, the bioecological model does not consider the perception of individuals within the exosystem. Policy does not create or speak for itself but is rather a biproduct of individual and communal demand. Policy can force temporary changes in the social norms and values, but, as Bronfenbrenner and Ceci (1992) noted, changes in the microsystem are more effective at creating long-term change. The question that emerged from the current study regarding the bioecological model is what if the agents in the exosystem do not want to promote change within the meso- or microsystem? The results of the current study indicated that respondents are willing to act themselves, but not willing to elicit that behavior in others, which negates the inward flow of behavioral change.

Conclusion

It is estimated that less than five percent of the North American grasslands, also known as the North American prairie, remain due to increased agricultural production,

urbanization, and other human activity (National Park Service, 2016; Pieper, 2005; WWF, 2016). The United States protects less than one percent of the remaining grasslands through the National Park Service (National Park Service, 2016), which places protection and reconstruction of the ecosystem primarily on states, organizations, and individuals within in that region (United Nations Environmental Programme, 2012). Many studies have focused on individual proenvironmental behaviors such as bird watching (Cox & Gaston, 2016) and visiting local parks (Muratet et al.,2015; Shwartz et al., 2014), as well as how social constructs (Shapiro et al., 2016; Soga et al., 2016) and an innate desire to connect with nature (Wilson, 2009) aid in the development of proenvironmental behaviors; however, none have focused on how ecological citizenship is developed and how the state government, state organization partners, and environmental NGOs influence its development in the U.S. grasslands.

At its core, ecological citizenship and individual ecological citizens "know that today's acts will have implications for tomorrow's people" (Dobson, 2003, p. 106) and "will avail themselves of the opportunities for collective action with which political systems present them" (Dobson, 2003, p. 103). My purpose in this quantitative study was to explore the perceived role of state legislators and agents, state organization partners, and NGOs in the development and fostering of ecological citizenship within five states: Iowa, Kansas, Nebraska, South Dakota, and North Dakota. These five states were selected for this study because their borders lie solely within the U.S temperate grasslands. Grasslands, like forests, are essential to carbon sequestration and are vital participants in the carbon cycle (Freedman, 2014; Paustian et al., 2016; Smith, 2014), as

well as provide biodiversity within the region. Loss of biodiversity within a biome, and loss of a biome in its entirety, can increase disease transmission (Dantas-Torres, 2015), negatively impact an individual's mental health (Sandifer et al., 2015), and negatively affect an individual's immune system (von Hertzen et al., 2015), which makes understanding the relationship between the political system and the development and fostering of ecological citizenship vital to the region.

Chapter 2 traced the rise of the ecological citizen from its earliest governmental forms in the 17th and 18th centuries as the Massachusetts Bay Colony prohibited animal abuse (Eliot, 1963, p. 79), London residents addressed air pollution through the creation of city parks (Evelyn, 1976) and Tokugawa fought against deforestation by replanting trees in Japan (Marcon, 2015) to the rise of the environmental organization and society in the 19th and early 20th centuries (Cohen, 1988); however, it was not until 1962 and the publication of *Silent Spring* that the environment became a global social movement.

In *Silent Spring*, Carson (2002) depicted a fictional town where the environment had been destroyed by nuclear fallout and pesticides, then presented an argument against pesticide and chemical use in the United States. Carson's work, and other environmental voices of the early 1960's were so strong that President Kennedy ordered scientific investigations into the use of pesticides, and in 1972 DDT was banned in the United States (Lear, 1993). International response to environmental needs in the 1970s included the creation of the United Nations Environment Programme (Johnson, 2012) and the *Convention on International Trade in Endangered Species of Wild Flora and Fauna* (1973). International approaches valued scientific exchange, assessment, and promotion

of environmental needs within cultural contexts (United Nations Environment Programme, 2012. These policy themes continued throughout the 20th century to build off communal demands for a cleaner environment through transnational meetings and conferences that created a vast network of international policies that recognized global needs (United Nations Environment Programme, 2012).

Late-20th century and early-21st century environmental policy in the United States has expanded beyond fundamental air, water, and species protection (e.g., National Organic Program, 2015). Federal and state environmental agencies create partnerships with NGOs and institutions through State Wildlife Action Plans to create pathways for individuals to become involved in environmental policy and protection in their states (e.g., Rohweder, 2015; South Dakota Department of Game, Fish, and Parks, 2014; Zohrer, 2012). It is in this new sense of common fight and joint effort to care for the environment that provided the setting for the current study.

The results of the current study, presented in Chapter 4, indicated that while the respondent's individual environmental worldview was significantly related to their willingness to take action, this worldview was not equally attributable to the respondent's willingness across the political system. A state legislator's environmental worldview was more predictive of their willingness to take action than NGO administrators or state organization partner directors. The results also indicated that while the SWAP could create a pathway to ecological citizenship, the perceived value of public participation and state partnerships are not uniform within the political system.

While much was already known about proenvironmental behavior, ecological citizenship, and some barriers to ecological citizenship, little was known about how the political system perceived its role in the development and fostering of ecological citizenship. The current study, while limited in its scope, has shed some light on what was not known and has contributed to the body of literature on both ecological citizenship and the bioecological model. For the bioecological model to account for the development of ecological citizens, further research is needed on the resistance of individuals within the exosystem to elicit changes within the mesosystem and microsystem. Using the NEP scale, the current study expanded what is known about ecological citizenship and its relationship to the individual's environmental worldview; however, more research is needed to fully understand how communities, states, and governments can develop and foster ecological citizenship for future generations and the environmental health of the world.

References

Agyeman, J., & Evans, B. (2006). Justice, governance, and sustainability: Perspectives on environmental citizenship from North America and Europe. In A. Dobson & D. Bell (Eds.), *Environmental citizenship* (pp. 185-206). Cambridge, MA: MIT Press.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211. doi:10.1016/0749-5978(91)90020-T

Alisat, S., & Riemer, M. (2015). The environmental action scale: Development and psychometric evaluation. *Journal of Environmental Psychology*, *43*, 13-23. doi:10.1016/j.jenvp.2015.05.006

Alvesson, M., & Sandberg, J. (2013). *Constructing research questions: Doing interesting research*. Thousand Oaks, CA: Sage.

Anderson, M. (2016). For Earth Day, here's how Americans view environmental issues. Retrieved from http://www.pewresearch.org/fact-tank/2016/04/22/for-earth-day-heres-how-americans-view-environmental-issues/

Anderson, M. W. (2012). New ecological paradigm (NEP) scale. In I. Spellerberg, D. S. Fogel, S. E. Fredericks, L. M. Butler Harrington (Eds.), *The Berskshire encyclopedia of sustainability: Measurements, indicators, and research methods for sustainability* (pp. 260-262). Great Barrington, MA: Berkshire Publishing Group.

Andrews, M. P., Bubolz, M. M., & Paolucci, B. (1981). An ecological approach to study of the family. *Marriage & Family Review, 3*(1-2), 29-49. doi:10.1300/J002v03n01_02

Angeles, R. (2015). Predicting use of GoodGuide.com consumer product sustainability information using VBN theory and NEP scale. In *Artificial intelligence technologies and the evolution of Web 3.0* (pp. 248-272). Hershey, PA: IGI Global.

Annunziata, A., & Vecchio, R. (2016). Organic farming and sustainability in food choices: An analysis of consumer preference in Southern Italy. *Agriculture and Agricultural Science Procedia, 8,* 193-200. doi:10.1016/j.aaspro.2016.02.093

Apostolopoulou, E., & Adams, W. M. (2015). Biodiversity offsetting and conservation: Reframing nature to save it. *Oryx*, *51(1*), 1-9. doi:10.1017/S0030605315000782

Ashton, I. W., Symstad, A. J., Davis, C. J., & Swanson, D. J. (2016). Preserving prairies: Understanding temporal and spatial patterns of invasive annual bromes in the Northern Great Plains. *Ecosphere*, *7*(8), e01438. doi:10.1002/ecs2.1438

Asilsoy, B., & Oktay, D. (2016). Measuring the potential for ecological citizenship among residents in Famagusta, North Cyprus. *Open House International*, *41*(2), 47-55. Retrieved from https://www.researchgate.net/publication/306400379_Measuring_the_potential_for_ecological_citizenship_among_residents_in_Famagusta_north_Cyprus

Atav, E., Altunoğlu, B. D., & Sönmez, S. (2015). The determination of the environmental attitudes of secondary education students. *Procedia-Social and Behavioral Sciences*, *174*, 1391-1396. doi:10.1016/j.sbspro.2015.01.765

Audubon, J. J. (1843). *The birds of America* (Vol. 6). Retrieved from http://www.audubon.org/birds-of-america

Ballouard, J. M., Provost, G., Barré, D., & Bonnet, X. (2012). Influence of a field trip on the attitude of schoolchildren toward unpopular organisms: An experience with snakes. *Journal of Herpetology*, *46*(3), 423-428. doi:10.1670/11-118

Barry, J. (2006). Resistance is fertile: From environmental to sustainability citizenship. In A. Dobson & D. Bell (Eds.), *Environmental Citizenship* (pp. 21-49). Cambridge, MA: MIT Press.

Barry, J., & Frankland, E. G. (2014). *International encyclopedia of environmental politics*. London, United Kingdom: Routledge.

Beatley, T., & Newman, P. (2013). Biophilic cities are sustainable, resilient cities. *Sustainability*, *5*(8), 3328-3345. doi:10.3390/su5083328

Bell, D. (2013). Environmental citizenship: Global, local, and individual. In P. Harris (ed.), *Routledge Handbook of Global Environmental Politics* (347-359). New York, NY: Routledge.

Bell, D. R. (2005). Liberal environmental citizenship. *Environmental Politics*, *14*(2), 179-194. doi:10.1080/09644010500054863

Bencin, H., Kioko, J., & Kiffner, C. (2016). Local people's perceptions of wildlife species in two distinct landscapes of Northern Tanzania. *Journal for Nature Conservation, 34,* 82-92. doi:10.1016/j.jnc.2016.09.004

Bentham, J. (1996). *The collected works of Jeremy Bentham: An introduction to the principles of morals and legislation*. New York, NY: Clarendon Press.

Bergman, B. G. (2016). Assessing impacts of locally designed environmental education projects on students' environmental attitudes, awareness, and intention to act. *Environmental Education Research*, *22*(4), 480-503. doi:10.1080/13504622.2014.999225

Bickel, L. (2015). *Triumph over darkness: the life of Louis Braille*. New York, NY: Bloomsbury Publishing.

Bissing-Olson, M. J., Fielding, K. S., & Iyer, A. (2016). Experiences of pride, not guilt, predict pro-environmental behavior when pro-environmental descriptive norms are more positive. *Journal of Environmental Psychology*, *45*, 145-153. doi: 10.1016/j.jenvp.2016.01.001

Blanchet-Cohen, N., & Reilly, R. C. (2016). Immigrant children promoting environmental care: enhancing learning, agency and integration through culturally-responsive environmental education. *Environmental Education Research*, *23*(4), 553-572. doi: 10.1080/13504622.2016.1153046

Blühdorn, I. (2011). The politics of unsustainability: COP15, post-ecologism, and the ecological paradox. *Organization & Environment*, *24*(1), 34-53. doi: 10.1177/1086026611402008

Boon, H. J., Cottrell, A., King, D., Stevenson, R. B., & Millar, J. (2012). Bronfenbrenner's bioecological theory for modelling community resilience to natural disasters. *Natural Hazards*, *60*(2), 381-408. doi: 10.1007/s11069-011-0021-4

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review*. New York, NY: SAGE.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, *32*(7), 513-531. doi: 10.1037/0003-066X.32.7.513

Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.

Bronfenbrenner, U. (1995). Developmental ecology through space and time: A future perspective. In P. Moen, G. H. Elder, Jr., & K. Lüscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 619-647). Washington, DC, US: American Psychological Association. http://dx.doi.org/10.1037/10176-018

Bronfenbrenner, U. (2009). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Bronfenbrenner, U., & Ceci, S. J. (1994). Nature-nuture reconceptualized in developmental perspective: A bioecological model. *Psychological review*, *101*(4), 568-586. doi: 10.1037/0033-295x.101.4.568

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. *Handbook of child psychology*. doi: 10.1002/9780470147658.chpsy0114

Brown, T. A. (2014). *Confirmatory factor analysis for applied research*. New York, NY: Guilford Publications.

Bureau of Sociological Research. (2013). 2003 Nebraska Conservation and Environment Literacy and Awareness Survey. Retrieved from http://docs.wixstatic.com/ugd/066428_3e6a6e90d3ac45c390ad4bebc85ebd9f.pdf

Burns, H. L., & Briley, J. (2015). Going deep: Reflections on teaching deep ecology in Costa Rica. *Transformative Dialogues: Teaching & Learning Journal, 8*(2), 1-14. Retrieved from https://www.kpu.ca/sites/default/files/Transformative%20Dialogues/TD.8.2.3_Burns%26Briley_Teaching_Deep_Ecology.pdf

Buzby, J. C., Farah-Wells, H., & Hyman, J. (2014). *The estimated amount, value, and calories of postharvest food losses at the retail and consumer levels in the United States*, EIB-121, U.S. Department of Agriculture, Economic Research Service, February 2014.

Carmi, N., Arnon, S., & Orion, N. (2015). Seeing the forest as well as the trees: General vs. specific predictors of environmental behavior. *Environmental Education Research*, *21*(7), 1011-1028. doi: 10.1080/13504622.2014.949626

Carson, R. (1962). *Silent spring*. Boston: Houghton Mifflin.

Carter, A. (1993). Towards a green political theory. In A. Dobson & P. Lucardie (Eds.), *The politics of nature: Explorations in green political theory* (pp. 39-62). New York, NY: Routledge

Center for Biological Diversity v. Environmental Protection Agency, 847 F.3d 1075; 2017 U.S. App. LEXIS 1826; 83 ERC (BNA) 2165 (2017).

Chan, K. M., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., ... & Luck, G. W. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences*, *113*(6), 1462-1465. doi: 10.1073/pnas.1525002113

Chandler, E. W., & Dreger, R. M. (1993). Anthropocentrism: Construct validity and measurement. *Journal of Social Behavior and Personality*, *8*(2), 169.

Chandler, M., See, L., Buesching, C. D., Cousins, J. A., Gillies, C., Kays, R. W., ... & Tiago, P. (2017). Involving citizen scientists in biodiversity observation. In *The GEO handbook on biodiversity observation networks* (pp. 211-237). London: Springer International Publishing.

Chankrajang, T., & Muttarak, R. (2017). Green returns to education: Does schooling contribute to pro-environmental behaviours? Evidence from Thailand. *Ecological Economics*, *131*, 434-448. doi: 10.1016/j.ecolecon.2016.09.015

Chapin, F. S., & Knapp, C. N. (2015). Sense of place: A process for identifying and negotiating potentially contested visions of sustainability. *Environmental Science & Policy*, *53*, 38-46. doi: 10.1016/j.envsci.2015.04.012

Chapin, F. S., Sommerkorn, M., Robards, M. D., & Hillmer-Pegram, K. (2015). Ecosystem stewardship: A resilience framework for arctic conservation. *Global Environmental Change*, *34*, 207-217. doi: 10.1016/j.gloenvcha.2015.07.003

Chen, J., & Chang, Z. (2015). Rethinking urban green space accessibility: Evaluating and optimizing public transportation system through social network analysis in megacities. *Landscape and Urban Planning*, *143*, 150-159. doi: 10.1016/j.landurbplan.2015.07.007

Cheng, J. C. H., & Monroe, M. C. (2012). Connection to nature: Children's affective attitude toward nature. *Environment and Behavior*, *44*(1), 31-49. doi: 10.1177/0013916510385082

Civil Penalties; Inflation Adjustments for Civil Monetary Penalties, 81 Fed. Reg. 41862 (to be codified at 50 C.F.R. 11)

Clean Air Act of 1970, 42 U.S.C. § 7401 (2016).

Cockett, P. L. K. (2009). Ecological stewardship in the urban prairie: Grassroots weed awareness initiatives in Northwest Calgary, Alberta. *The view from the North*, 257.

Cohen, J. (1992). A power primer. *Psychological bulletin*, *112*(1), 155.

Cohen, M. P. (1988). *The history of the Sierra Club, 1892-1970*. New York: Random House.

Connors, M. C. (2016). Creating cultures of learning: A theoretical model of effective early care and education policy. *Early Childhood Research Quarterly*, *36*, 32-45.

Convention on International Trade in Endangered Species of Wild Flora and Fauna, 1973, 27 U.S.T. 1087; T.I.A.S. 8249; 993 U.N.T.S. 243.

Cooper, C., Larson, L., Dayer, A., Stedman, R., & Decker, D. (2015). Are wildlife recreationists conservationists? Linking hunting, birdwatching, and pro-environmental behavior. *The Journal of Wildlife Management, 79*(3), 446-457.

Corporation for National and Community Service. (2016). Volunteering and civic engagement in the United States. Retrieved from https://www.volunteeringinamerica.gov/national

Cox, D. T., & Gaston, K. J. (2016). Urban bird feeding: Connecting people with nature. *PloS one, 11*(7), e0158717. doi: 10.1371/journal.pone.0158717

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. New York: Sage Publications.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. New York: Sage Publications.

Curtis, D. J. (2009). Creating inspiration: the role of the arts in creating empathy for ecological restoration. *Ecological Management & Restoration, 10*(3), 174-184. doi: 10.1111/j.1442-8903.2009.00487.x

Dantas-Torres, F. (2015). Climate change, biodiversity, ticks and tick-borne diseases: The butterfly effect. *International Journal for Parasitology: Parasites and Wildlife, 4*(3), 452-461. doi: 10.1016/j.ijppaw.2015.07.001

Darwin, C. (2008). *On the origin of species*. New York: Bantam Dell

de Leeuw, A., Valois, P., Ajzen, I., & Schmidt, P. (2015). Using the theory of planned behavior to identify key beliefs underlying pro-environmental behavior in high-school students: Implications for educational interventions. *Journal of Environmental Psychology, 42,* 128-138. doi: 10.1016/j.jenvp.2015.03.005

de Pinho, J. R., Grilo, C., Boone, R. B., Galvin, K. A., & Snodgrass, J. G. (2014). Influence of aesthetic appreciation of wildlife species on attitudes towards their conservation in Kenyan agropastoralist communities. *PloS ONE, 9*(2), e88842. doi: 10.1371/journal.pone.0088842

Defenders of Wildlife et al. v. Zinke, 849 F.3d 1077; 2017 U.S. App. LEXIS 3825; 83 ERC (BNA) 2381 (2017).

Dennison, S., Smallbone, H., & Occhipinti, S. (2017). Understanding how incarceration challenges proximal processes in father-child relationships: Perspectives of imprisoned fathers. *Journal of Developmental and Life-Course Criminology, 3*(1), 15-38. doi: 10.1007/s40865-017-0054-9

Di Fabio, A., & Bucci, O. (2016). Green positive guidance and green positive life counseling for decent work and decent lives: Some empirical results. *Frontiers in Psychology, 7*. doi: 10.3389/fpsyg.2016.00261

Dickinson, J. L., & Crain, R. L. (2014). Socially networked citizen science and the crowd-sourcing of pro-environmental collective actions. In N. Agarwal, M. Lim, & R. Wigand (Eds.), *Online Collective Action* (pp. 133-152). Vienna: Springer.

Didkowsky, N., & Ungar, M. (2016). A social ecological approach to understanding resilience among rural youth. In U. Kumar (Ed.), *The Routledge International Handbook of Psychosocial Resilience* (pp. 46-59). New York, NY: Routledge.

Dobson, A. (2003). *Citizenship and the environment*. New York: Oxford University Press.

Dobson, A. (2007). Environmental citizenship: towards sustainable development. *Sustainable Development, 15*(5), 276-285. doi: 10.1002/sd.344

Dobson, A. (2010). Environmental citizenship and pro-environmental behaviour: Rapid research and evidence review. *Sustainable Development Research Network, London*.

Dobson, A. (2012). *Green political thought*. London: Taylor and Francis.

Domingues, M., & Goncalves, C. E. B. (2014). Systematic review of the bioecological theory in sport sciences. *Baltic Journal of Health and Physical Activity, 6*(2), 142-153. doi: 10.2478/bjha-2014-0014

Dresner, M., Handelman, C., Braun, S., & Rollwagen-Bollens, G. (2015). Environmental identity, pro-environmental behaviors, and civic engagement of volunteer stewards in Portland area parks. *Environmental Education Research, 21*(7), 991-1010. doi: 10.1080/13504622.2014.964188

Dryzek, J. S. (2013). *The politics of the earth: Environmental discourses*. London: Oxford University Press.

Duke, N. N., Skay, C. L., Pettingell, S. L., & Borowsky, I. W. (2009). From adolescent connections to social capital: Predictors of civic engagement in young

adulthood. *Journal of Adolescent Health, 44*(2), 161-168. doi: 10.1016/j.jadohealth.2008.07.007

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of Social Issues, 56*(3), 425-442. Doi: 10.1111/0022-4537.00176

Dyke, S., Johnson, S., & Isakson, P. (2015). North Dakota state wildlife action plan. Retrieved from https://gf.nd.gov/sites/default/files/publications/swap-2015_0.pdf

Eckersley, R. (2004). *The green state: rethinking democracy and sovereignty*. Boston: MIT Press.

Eden, S. (1996). Public participation in environmental policy: Considering scientific, counter-scientific and non-scientific contributions. *Public Understanding of Science, 5*(3), 183-204. doi: 10.1088/0963-6625/5/3/001

Edwards, S., Henderson, M., Gronn, D., Scott, A., & Mirkhil, M. (2017). Digital disconnect or digital difference? A socio-ecological perspective on young children's technology use in the home and the early childhood centre. *Technology, Pedagogy and Education*, *26*(1), 1-17. doi: 10.1080/1475939x.2016.1152291

Elliot, C. (1963). The Massachusetts body of liberties. In *American Historical Documents 1000-1904, Vol. 43*. New York: Collier & Son Corporation.

Ellwood, E. R., Crimmins, T. M., & Miller-Rushing, A. J. (2016). Citizen science and conservation: Recommendations for a rapidly moving field. *Biological Conservation, 208*, 1-4. doi: 10.1016/j.biocon.2016.10.014

Emmenegger, S., & Tschentscher, A. (1993). Taking nature's rights seriously: the long way to biocentrism in environmental law. *Geo. Int'l Envtl. L. Rev., 6*, 545.

Endangered and Threatened Wildlife and Plants; Proposed Threatened Listing Determination for the Oceanic Whitetip Shark Under the Endangered Species Act (ESA), 81 Fed. Reg. 96034 (to be codified at 50 C.F.R. 223)

Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1544 (2016).

Erdener, M. A. (2016). Principals' and teachers' practices about parent involvement in schooling. *Universal Journal of Educational Research, 4*(12A), 151-159. doi: 10.13189/ujer.2016.041319

Evelyn, J. (1976). *Fumifugium*. Rota.

Feeding America. (2015). Fighting food waste with food rescue. Retrieved from http://www.feedingamerica.org/our-work/reduce-food-waste.html

Ferster, C. J., & Coops, N. C. (2016). Integrating volunteered smartphone data with multispectral remote sensing to estimate forest fuels. *International Journal of Digital Earth, 9*(2), 171-196. doi: 10.1080/17538947.2014.1002865

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. New York, NY: Sage.

Fleming, C. B., Guttmannova, K., Cambron, C., Rhew, I. C., & Oesterle, S. (2016). Examination of the divergence in trends for adolescent marijuana use and

marijuana-specific risk factors in Washington State. *Journal of Adolescent Health*, *59*(3), 269-275. doi: 10.1016/j.jadohealth.2016.05.008

Fleury-Bahi, G., Marcouyeux, A., Renard, E., & Roussiau, N. (2015). Factorial structure of the New Ecological Paradigm scale in two French samples. *Environmental Education Research*, *21*(6), 821-831. doi: 10.1080/13504622.2014.913127

Forrester, T. D., Baker, M., Costello, R., Kays, R., Parsons, A. W., & McShea, W. J. (2016). Creating advocates for mammal conservation through citizen science. *Biological Conservation, 208*, 98-105. doi: 10.1016/j.biocon.2016.06.025

Francis, P., & Si, L. (2015). On care for our common home. *Vatican City, Italy: Encyclical Letter, Libreria Editrice Vaticana*.

Freedman, B. (2014). Maintaining and enhancing ecological carbon sequestration. In B. Freedman (Ed.), *Global environmental change* (pp. 783-801). Netherlands: Springer

Freese, C. H. (2015). A new era of protected areas for the great plains. In G. Wuerthner, E. Crist, & T. Butler (Eds.), *Protecting the wild* (pp. 208-214). Washington: Island Press/Center for Resource Economics.

Fujitani, M. L., McFall, A., Randler, C., & Arlinghaus, R. (2016). Efficacy of lecture-based environmental education for biodiversity conservation: a robust controlled field experiment with recreational anglers engaged in self-organized fish stocking. *Journal of Applied Ecology*, *53*(1), 25-33. doi: 10.1111/1365-2664.12560

Funk, C., & Kennedy, B. (2016, October 4). Everyday environmentalism. *Pew Research Center*. Retrieved from http://www.pewinternet.org/2016/10/04/everyday-environmentalism/

Galli, A., Wackernagel, M., Iha, K., & Lazarus, E. (2014). Ecological footprint: Implications for biodiversity. *Biological Conservation, 173*, 121-132. doi: 10.1016/j.biocon.2013.10.019

Geldhof, G. J., Bowers, E. P., & Lerner, R. M. (2013). Special section introduction: Thriving in context: Findings from the 4-H study of positive youth development. *Journal of Youth and Adolescence, 42*(1), 1-5. doi: 10.1007/s10964-012-9855-7

Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology, 49*(3), 141-157. doi: 10.1002/ijop.12034

Glucker, A. N., Driessen, P. P., Kolhoff, A., & Runhaar, H. A. (2013). Public participation in environmental impact assessment: why, who and how?. *Environmental Impact Assessment Review, 43*, 104-111. doi: 10.1016/j.eiar.2013.06.003

Goodman, L. A. (1961). Snowball sampling. *The annals of mathematical statistics*, 148-170.

Gould, E. R. L. (1888). Park areas and open spaces in cities. *Publications of the American Statistical Association, 1*(2-3), 49-61. doi: 10.2307/2276341

Greaves, M., Zibarras, L. D., & Stride, C. (2013). Using the theory of planned behavior to explore environmental behavioral intentions in the workplace. *Journal of Environmental Psychology, 34*, 109-120. doi: 10.1016/j.jenvp.2013.02.003

Groeneveld, S., Tummers, L., Bronkhorst, B., Ashikali, T., & Van Thiel, S. (2015). Quantitative methods in public administration: Their use and development through time. *International Public Management Journal*, *18*(1), 61-86. https://doi.org/10.1080/10967494.2014.972484

Grønhøj, A., & Thøgersen, J. (2012). Action speaks louder than words: The effect of personal attitudes and family norms on adolescents' pro-environmental behaviour. *Journal of Economic Psychology, 33*(1), 292-302. https://doi.org/10.1016/j.joep.2011.10.001

Guckian, M., De Young, R., & Harbo, S. (2017). Beyond green consumerism: Uncovering the motivations of green citizenship. doi: 10.3998/mjs.12333712.0005.105

Hand, K. L., Freeman, C., Seddon, P. J., Recio, M. R., Stein, A., & van Heezik, Y. (2017). The importance of urban gardens in supporting children's biophilia. *Proceedings of the National Academy of Sciences, 114*(2), 274-279. https://doi.org/10.1073/pnas.1609588114

Hanspach, J., Loos, J., Dorresteijn, I., Abson, D. J., & Fischer, J. (2016). Characterizing social–ecological units to inform biodiversity conservation in cultural landscapes. *Diversity and Distributions*. doi: 10.1111/ddi.12449

Harring, N., & Jagers, S. C. (2013). Should we trust in values? Explaining public support for pro-environmental taxes. *Sustainability*, *5*(1), 210-227. https://doi.org/10.3390/su5010210

Harris, C. C., Becker, D. R., Nielsen, E. A., & Mclaughlin, W. J. (2014). Public deliberation about salmon restoration impacts: Differences in the input of citizens in different community roles. *Journal of Environmental Assessment Policy and Management*, *16*(04), 1450033. https://doi.org/10.1142/s1464333214500331

Hasford, J., Loomis, C., Nelson, G., & Pancer, S. M. (2016). Youth narratives on community experiences and sense of community and their relation to participation in an early childhood development program. *Youth & Society*, *48*(4), 577-596. https://doi.org/10.1177/0044118x13506447

Hausmann, A., Slowtow, R., Burns, J. K., & Di Minin, E. (2016). The ecosystem service of sense of place: benefits for human well-being and biodiversity conservation. *Environmental Conservation*, *43*(02), 117-127. doi: 10.1017/S0376892915000314

Hayward, B. (2012). *Children, citizenship and environment: Nurturing a democratic imagination in a changing world*. New York, NY: Routledge.

Hayward, T. (2006). Ecological citizenship: justice, rights and the virtue of resourcefulness. *Environmental Politics*, *15*(03), 435-446. https://doi.org/10.1080/09644010600627741

Hedlund-de Witt, A., De Boer, J., & Boersema, J. J. (2014). Exploring inner and outer worlds: A quantitative study of worldviews, environmental attitudes, and

sustainable lifestyles. *Journal of Environmental Psychology*, *37*, 40-54. https://doi.org/10.1016/j.jenvp.2013.11.005

Herrmann, P., Waxman, S. R., & Medin, D. L. (2010). Anthropocentrism is not the first step in children's reasoning about the natural world. *Proceedings of the National Academy of Sciences*, *107*(22), 9979-9984. https://doi.org/10.1073/pnas.1004440107

Hill, R., Dyer, G. A., Lozada-Ellison, L. M., Gimona, A., Martin-Ortega, J., Munoz-Rojas, J., & Gordon, I. J. (2015). A social–ecological systems analysis of impediments to delivery of the Aichi 2020 Targets and potentially more effective pathways to the conservation of biodiversity. *Global Environmental Change, 34*, 22-34. https://doi.org/10.1016/j.gloenvcha.2015.04.005

Hoffman, M. A., & Kruczek, T. (2011). A bioecological model of mass trauma: Individual, community, and societal effects. *The Counseling Psychologist*, *39*(8), 1087-1127. https://doi.org/10.1177/0011000010397932

Holdgate, M. (2014). *The green web: A union for world conservation*. New York, NY: Routledge.

Howe, M. C., & Briggs, A. K. (1982). Ecological systems model for occupational therapy. *American Journal of Occupational Therapy, 36*(5), 322-327. https://doi.org/10.5014/ajot.36.5.322

Howell, R. A. (2013). It's not (just) "the environment, stupid!" Values, motivations, and routes to engagement of people adopting lower-carbon lifestyles. *Global*

Environmental Change, *23*(1), 281-290. https://doi.org/10.1016/j.gloenvcha.2012.10.015

Huckle, J., & Wals, A. E. (2015). The UN Decade of Education for Sustainable Development: business as usual in the end. *Environmental Education Research*, *21*(3), 491-505. https://doi.org/10.1080/13504622.2015.1011084

Ingram, D. (2013). Beastly measures: Animal welfare, civil society, and state policy in victorian Canada. *Journal of Canadian Studies*, *47*(1), 221-252. https://doi.org/10.3138/jcs.47.1.221

International Union for Conservation of Nature. (2016). Interview: Temperate grasslands, the most threatened biome in the world. Retrieved from https://www.iucn.org/content/interview-temperate-grasslands-most-threatened-biome-world

Isin, E. F., & Wood, P. K. (1999). *Citizenship and identity* (Vol. 448). New York, NY: Sage.

Islar, M., & Busch, H. (2016). "We are not in this to save the polar bears!"–the link between community renewable energy development and ecological citizenship. *Innovation: The European Journal of Social Science Research*, 1-17. doi: 10.1080/13511610.2016.1188684

Jagers, S. C. (2009). In search of the ecological citizen. *Environmental Politics*, *18*(1), 18-36. doi:10.1080/09644010802624751

Jagers, S. C., Martinsson, J., & Matti, S. (2014). Ecological citizenship: a driver of pro-environmental behaviour?. *Environmental Politics, 23*(3), 434-453. doi: 10.1080/09644016.2013.835202

Jayachandran, S., de Laat, J., Lambin, E. F., Stanton, C. Y., Audy, R., & Thomas, N. E. (2017). Cash for carbon: A randomized trial of payments for ecosystem services to reduce deforestation. *Science, 357*(6348), 267-273. doi: 10.1126/science.aan0568

Johnson, M. F., Hannah, C., Acton, L., Popovici, R., Karanth, K. K., & Weinthal, E. (2014). Network environmentalism: Citizen scientists as agents for environmental advocacy. *Global Environmental Change, 29*, 235-245. https://doi.org/10.1016/j.gloenvcha.2014.10.006

Johnson, S. (2012). *UNEP: The first 40 years: A narrative*. Retrieved from http://web.unep.org/about/who-we-are/overview

Jones-Walters, L., & Čivić, K. (2013). European protected areas: past, present and future. *Journal for Nature Conservation*, *21*(2), 122-124. https://doi.org/10.1016/j.jnc.2012.11.006

Kaiser, F. G., & Wilson, M. (2003). General Ecological Behavior Scale [Database record]. Retrieved from PsycTESTS. doi: http://dx.doi.org/10.1037/t03323-000

Kellert, S. R., & Wilson, E. O. (1995). *The biophilia hypothesis*. New York, NY: Island Press.

Kelly, J. R., & Abel, T. D. (2012). Fostering ecological citizenship: the case of environmental service-learning in Costa Rica. *International Journal of*

Scholarship of Teaching and Learning, *6*(2). https://doi.org/10.20429/ijsotl.2012.060216

Kerr, J. M., Lapinski, M. K., Liu, R. W., & Zhao, J. (2017). Long-term effects of payments for environmental services: Combining insights from communication and economics. *Sustainability*, 9(9), 1627. doi: 10.3390/su9091627

Kiatkawsin, K., & Han, H. (2017). Young travelers' intention to behave pro-environmentally: Merging the value-belief-norm theory and the expectancy theory. *Tourism Management*, *59*, 76-88. https://doi.org/10.1016/j.tourman.2016.06.018

King, D. (2016). The exosystem and the community in disaster resilience. In H. Boon, A. Cottrell, & D. King (Eds.), *Disasters and social resilience: A bioecological approach* (pp. 138-162). New York, NY: Routledge

Kobori, H., Dickinson, J. L., Washitani, I., Sakurai, R., Amano, T., Komatsu, N., ... & Miller-Rushing, A. J. (2016). Citizen science: a new approach to advance ecology, education, and conservation. *Ecological Research*, *31*(1), 1-19. https://doi.org/10.1007/s11284-015-1314-y

Kolinjivadi, V., Van Hecken, G., Almeida, D. V., Dupras, J., & Kosoy, N. (2017). Neoliberal performatives and the 'making'of Payments for Ecosystem Services (PES). *Progress in Human Geography*, *1*, 23. https://doi.org/10.1177/0309132517735707

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental education research*, *8*(3), 239-260. doi: 10.1080/13504620220145401

Kopnina, H. (2015). Revisiting the Lorax complex: deep ecology and biophilia in cross-cultural perspective. *Environmental Sociology*, *1*(4), 315-324. https://doi.org/10.1080/23251042.2015.1048765

Kopnina, H., & Cherniak, B. (2015). Cultivating a value for non-human interests through the convergence of animal welfare, animal rights, and deep ecology in environmental education. *Education Sciences*, *5*(4), 363-379. https://doi.org/10.3390/educsci5040363

Krettenauer, T. (2017). Pro-environmental behavior and adolescent moral development. *Journal of Research on Adolescence*, *27*(3), 581-593. https://doi.org/10.1111/jora.12300

Kumar, P., & Ghodeswar, B. M. (2015). Factors affecting consumers' green product purchase decisions. *Marketing Intelligence & Planning*, *33*(3), 330-347. https://doi.org/10.1108/mip-03-2014-0068

Kuo, S. Y., & Jackson, N. L. (2014). Influence of an environmental studies course on attitudes of undergraduates at an engineering university. *The Journal of Environmental Education*, *45*(2), 91-104. https://doi.org/10.1080/00958964.2013.853643

Lange, A. C., & Garrett, J. M. (2014). Intentionally using environments in student leadership development. *Developments*, *12*(2). Retrieved from

http://www.myacpa.org/article/intentionally-using-environments-student-leadership-developments

Larson, L. R., Stedman, R. C., Cooper, C. B., & Decker, D. J. (2015). Understanding the multi-dimensional structure of pro-environmental behavior. *Journal of Environmental Psychology*, *43*, 112-124. https://doi.org/10.1016/j.jenvp.2015.06.004

Lasrado, F., & Arora, B. (2017). Social identity and environmental citizenship in multinational corporations: an exploratory investigation and future research directions. *Social Identities*, 1-23. doi: 10.1080/13504630.2017.1386357

Lazarus, R. (2014). Environmental law without congress. *Journal of Land Use & Environmental Law*, *30*(1), 15-34.

Lear, L. J. (1993). Rachel Carson's" Silent Spring". *Environmental history review*, *17*(2), 23-48.

Lee, A., & Kincaid, J. (2016). Two problems of climate ethics: Can we lose the planet but save ourselves?. *Ethics, Policy & Environment*, *19*(2), 141-144. https://doi.org/10.1080/21550085.2016.1195559

Lee, C. Y., Hochman, G., Prince, S. E., & Ariely, D. (2016). Past actions as self-signals: How acting in a self-interested way influences environmental decision making. *PloS One*,*11*(7). doi: 10.1371/journal.pone.0158456

Lester, L., & Cottle, S. (2009). Visualizing climate change: Television news and ecological citizenship. *International journal of communication*, *3*, 17.

Lester, L., Cross, D., Terrelinck, D., ... & Thomas, L. (2016). Encouraging the positive use of technology through community engagement. *Safer Communities, 15*(3), 134-141.

Lewandowski, E. J., & Oberhauser, K. S. (2015). Butterfly citizen scientists in the United States increase their engagement in conservation. *Biological Conservation*. doi: 10.1016/j.biocon.2015.07.029

Liefländer, A. K., & Bogner, F. X. (2014). The effects of children's age and sex on acquiring pro-environmental attitudes through environmental education. *The Journal of Environmental Education, 45*(2), 105-117.

Lienhard, J. H. (2015). Revolution: In communication; in education. *Engineering Education Letters*, 5.

Lin, B. B., Fuller, R. A., Bush, R., Gaston, K. J., & Shanahan, D. F. (2014). Opportunity or orientation? Who uses urban parks and why. *PLoS one, 9*(1), e87422.

Litt, J. S., Schmiege, S. J., Hale, J. W., Buchenau, M., & Sancar, F. (2015). Exploring ecological, emotional and social levers of self-rated health for urban gardeners and non-gardeners: A path analysis. *Social Science & Medicine, 144*, 1-8.

Luke, T. W. (2009). An apparatus of answers? Ecologism as ideology in the 21st century. *New Political Science, 31*(4), 487-498. doi:10.1080/07393140903322562

Lummis, G. W., Morris, J. E., Lock, G., & Odgaard, J. (2016). The influence of ecological citizenship and political solidarity on Western Australian student teachers' perceptions of sustainability issues. *International Research in*

Geographical and Environmental Education, 1-15. doi: 10.1080/10382046.2016.1235359

MacGregor, S. (2006). No sustainability without justice: A feminist critique of environmental citizenship. *Environmental citizenship*, 101-126.

MacGregor, S. (2011). *Beyond mothering earth: Ecological citizenship and the politics of care*. UBC Press.

MacGregor, S. (2014). Ecological citizenship. *Heijden, In: HA van der Heiden (ed) Handbook of Political Citizenship and Social Movements. Northampton: Edward Elgar*, 107-132.

Machi, L. A., & McEvoy, B. T. (2016). *The literature review: Six steps to success*. Corwin Press.

Mahoney, J. W., Gucciardi, D. F., Mallett, C. J., & Ntoumanis, N. (2014). Adolescent performers' perspectives on mental toughness and its development: The utility of the bioecological model. *The Sport Psychologist*, *28*(3), 233-244.

Manesi, Z., Van Lange, P. A., & Pollet, T. V. (2015). Butterfly eyespots: Their potential influence on aesthetic preferences and conservation attitudes. *PloS one*, *10*(11), e0141433.

Mannion, G., Biesta, G., Priestley, M., & Ross, H. (2011). The global dimension in education and education for global citizenship: Genealogy and critique. *Globalisation, Societies and Education*, *9*(3-4), 443-456.

Marcon, F. (2015). *The knowledge of nature and the nature of knowledge in early modern Japan*. University of Chicago Press.

Marsh, G.P. (1907). *Man and nature: The Earth modified by human action*. Retrieved from http://www.biodiversitylibrary.org/bibliography/13865#/summary

Marshall, T. H. (1950). *Citizenship and social class* (Vol. 11, pp. 28-29). Cambridge.

Martín-López, B., & Montes, C. (2015). Restoring the human capacity for conserving biodiversity: A social–ecological approach. *Sustainability Science*, *10*(4), 699-706. doi: 10.1007/s11625-014-0283-3

Martín-López, B., Montes, C., & Benayas, J. (2007). The non-economic motives behind the willingness to pay for biodiversity conservation. *Biological conservation*, *139*(1), 67-82.

Martinsson, J., & Lundqvist, L. J. (2010). Ecological citizenship: coming out 'clean'without turning 'green'?. *Environmental politics*, *19*(4), 518-537.

Mason, K. (2014). Becoming citizen green: Prefigurative politics, autonomous geographies, and hoping against hope. *Environmental Politics*, *23*(1), 140-158.

Masud, M. M., Akhtar, R., Afroz, R., Al-Amin, A. Q., & Kari, F. B. (2015). Pro-environmental behavior and public understanding of climate change. *Mitigation and Adaptation Strategies for Global Change*, *20*(4), 591-600.

McCord, E. S., & Houser, K. A. (2017). Neighborhood parks, evidence of guardianship, and crime in two diverse US cities. *Security Journal*, *30*(3), 807-824. doi: 10.1057/sj.2015.11

McKinley, D. C., Miller-Rushing, A. J., Ballard, H. L., Bonney, R., Brown, H., Cook-Patton, S. C., ... & Ryan, S. F. (2016). Citizen science can improve conservation

science, natural resource management, and environmental protection. *Biological Conservation*.

Melo-Escrihuela, C. (2015). Should ecological citizenship advocates praise the Green State?. *Environmental Values, 24*(3), 321-344.

Miao, L., & Wei, W. (2013). Consumers' pro-environmental behavior and the underlying motivations: A comparison between household and hotel settings. *International Journal of Hospitality Management, 32*, 102-112.

Middlemiss, L. (2010). Reframing individual responsibility for sustainable consumption: lessons from environmental justice and ecological citizenship. *Environmental Values, 19*(2), 147-167.

Middlemiss, L. (2010). Reframing individual responsibility for sustainable consumption: lessons from environmental justice and ecological citizenship. *Environmental Values, 19*(2), 147-167.

Mihaylov, N. L., & Perkins, D. D. (2015). Local environmental grassroots activism: Contributions from environmental psychology, sociology and politics. *Behavioral Sciences, 5*(1), 121-153.

Mill, J. S. (1901). *Utilitarianism*. Longmans, Green and Company.

Muir, J. (1911). *My first summer in the Sierra*. Retrieved from http://www.yosemite.ca.us/john_muir_writings/my_first_summer_in_the_sierra/my_first_summer_in_the_sierra.pdf

Muir, J. (1916). *A thousand mile walk to the gulf*. Retrieved from http://vault.sierraclub.org/john_muir_exhibit/writings/a_thousand_mile_walk_to_the_gulf/

Muratet, A., Pellegrini, P., Dufour, A. B., Arrif, T., & Chiron, F. (2015). Perception and knowledge of plant diversity among urban park users. *Landscape and Urban Planning*, *137*, 95-106. doi: 10.1016/j.landurbplan.2015.01.003

Naess, A. (1973). The shallow and the deep, long-range ecology movement. A summary∗. *Inquiry*, *16*(1-4), 95-100.

Naess, A., & Sessions, G. (1984). Basic principles of deep ecology. Ecophilosophy, 6(3), 7.

Nasango, S. W., & Gabsa, W. N. (2000). Environmental policy and the politics of ecologism in Cameroon and Kenya. *Journal of Sustainable Development in Africa*, *2*(2), 71-108.

National Conference of State Legislatures. (2017). 2017 state & legislative partisan composition. Retrieved from http://www.ncsl.org/portals/1/documents/elections/Legis_Control_2017_March_27_11am.pdf

National Environmental Policy Act of 1969 § 102, 42 U.S.C. § 4332 (2016).

National Organic Program, 7 U.S.C. § 205 (2015).

National Park Service. (2016). Prairies and grasslands. Retrieved from https://www.nps.gov/home/learn/nature/prairies.htm

Navarro, L. M., & Pereira, H. M. (2015). Towards a European policy for rewilding. In *Rewilding European Landscapes* (pp. 205-223). Springer International Publishing.

Noffsinger, M. A., Pfefferbaum, B., Pfefferbaum, R. L., Sherrieb, K., & Norris, F. H. (2012). The burden of disaster: Part I. Challenges and opportunities within a child's social ecology. *International journal of emergency mental health*, *14*(1), 3.

O'Kane, G. (2016). A moveable feast: Exploring barriers and enablers to food citizenship. *Appetite*, *105*, 674-687.

Ogunbode, C. A. (2013). The NEP scale: measuring ecological attitudes/worldviews in an African context. *Environment, development and sustainability*, *15*(6), 1477-1494.

Olmsted, F. L. (1852). *Walks and talks of an American farmer in England* (Vol. 1). GP Putnam.

Olmsted, F. L. (1881). *A consideration of the justifying value of a public park*. Tolman & White.

O'Sullivan, E., Rassel, G. R., & Berner, A. M. (2016). *Research Methods for Public Administrators, 5/e for Laureate Education, 5th Edition*.

Palliwoda, J., Kowarik, I., & von der Lippe, M. (2017). Human-biodiversity interactions in urban parks: The species level matters. *Landscape and Urban Planning*, *157*, 394-406.

Paustian, L., Babcock, B., Hatfield, J. L., Lal, R., McCarl, B. A., McLaughlin, S., ... & Rosenzweig, C. (2016, April). Agricultural mitigation of greenhouse gases:

science and policy options. In *2001 Conference Proceedings, First National Conference on Carbon Sequestration*. Washington, DC: Conference on Carbon Sequestration.

Pearson, L., Newton, P., & Roberts, P. (Eds.). (2014). *Resilient sustainable cities: a future*. Routledge.

Peart, R. (2008). Life in a working landscape: Towards a conservation strategy for the world's temperate grasslands: A record of the World Temperate Grasslands Conservation Initiative Workshop, Hohhot, China, 28 and 29 June 2008, Temperate Grasslands Conservation Initiative. *Vancouver, British Columbia, Canada: International Union for Conservation of Nature and World Commission on Protected Areas*.

Pelican Island Reservation for the protection of native birds. Exec. Order No. 1014 (Jan. 26, 1909), http://www.theodorerooseveltcenter.org/Research/Digital-Library/Record/ImageViewer?libID=o286619&imageNo=1

Philippon, D. J. (2004). *Conserving words: How American nature writers shaped the environmental movement*. University of Georgia Press.

Pieper, R. D. (2005). Grasslands of central North America. *Grasslands of the world. Food and Agricultural Organization of the United Nations, Rome, Italy*, 221-263.

Pittenger, S. L., Huit, T. Z., & Hansen, D. J. (2016). Applying ecological systems theory to sexual revictimization of youth: A review with implications for research and practice. *Aggression and violent behavior*, *26*, 35-45.

Polonsky, M. J., Vocino, A., Grimmer, M., & Miles, M. (2016). Past and future orientation, environmental attitudes and green consumer behaviour. In *Looking Forward, Looking Back: Drawing on the Past to Shape the Future of Marketing* (pp. 654-654). Springer International Publishing.

Poortinga, W., Steg, L., & Vlek, C. (2004). Values, environmental concern, and environmental behavior: A study into household energy use. *Environment and behavior*, *36*(1), 70-93.

Prati, G., Albanesi, C., & Pietrantoni, L. (2017). The interplay among environmental attitudes, pro-environmental behavior, social identity, and pro-environmental institutional climate. A longitudinal study. *Environmental Education Research*, *23*(2), 176-191.

Prell, C., Feng, K., Sun, L., Geores, M., & Hubacek, K. (2014). The economic gains and environmental losses of US consumption: a world-systems and input-output approach. *Social Forces*, *93*(1), 405-428. doi: 10.1093/sf/sou048

Prendergast, T. (2016). Seeking early literacy for all: An investigation of children's librarians and parents of young children with disabilities' experiences at the public library. *Library Trends*, *65*(1), 65-91. doi: 10.1353/lib.2016.0023

Prévot, A. C., Clayton, S., & Mathevet, R. (2016). The relationship of childhood upbringing and university degree program to environmental identity: Experience in nature matters. *Environmental Education Research*, 1-17.

Profice, C., Santos, G. M., & dos Anjos, N. A. (2016). Children and nature in Tukum Village: Indigenous education and biophilia. *J Child Adolesc*. 4:6. doi: 10.4172/2375-4494.1000320

Purvis, R. L., Zagenczyk, T. J., & McCray, G. E. (2015). What's in it for me? Using expectancy theory and climate to explain stakeholder participation, its direction and intensity. *International Journal of Project Management*, *33*(1), 3-14.

Rabiner, D. L., Godwin, J., & Dodge, K. A. (2016). Predicting academic achievement and attainment: the contribution of early academic skills, attention difficulties, and social competence. *School Psychology Review*, *45*(2), 250-267.

Rader, N. E., Byrd, S. H., Fountain, B. J., Bounds, C. W., Gray, V., & Frugé, A. D. (2015). We never see children in parks: A qualitative examination of the role of safety concerns on physical activity among children. *Journal of physical activity and health*, *12*(7), 1010-1016. doi: 10.1123/jpah.2014-0053

Reese, G., & Jacob, L. (2015). Principles of environmental justice and pro-environmental action: A two-step process model of moral anger and responsibility to act. *Environmental Science & Policy*, *51*, 88-94.

Renn, K. A., & Arnold, K. D. (2003). Reconceptualizing research on college student peer culture. *The journal of higher education*, *74*(3), 261-291.

Riemer, M., Lynes, J., & Hickman, G. (2014). A model for developing and assessing youth-based environmental engagement programmes. *Environmental Education Research*, *20*(4), 552-574.

Rohweder, M. R. (2015). *Kansas wildlife action plan.* Ecological Services Section, Kansas Department of Wildlife, Parks and Tourism in cooperation with the Kansas Biological Survey.

Rosen, G., & Imperato, P. J. (2015). *A history of public health*. JHU Press.

Ruokolainen, L., Fyhrquist, N., & Haahtela, T. (2016). The rich and the poor: environmental biodiversity protecting from allergy. *Current Opinion in Allergy and Clinical Immunology*, *16*(5), 421-426. doi: 10.1097/ACI.0000000000000304

Russ, A., Peters, S. J., E. Krasny, M., & Stedman, R. C. (2015). Development of ecological place meaning in New York City. *The Journal of Environmental Education*, *46*(2), 73-93.

Sandifer, P. A., Sutton-Grier, A. E., & Ward, B. P. (2015). Exploring connections among nature, biodiversity, ecosystem services, and human health and well-being: Opportunities to enhance health and biodiversity conservation. *Ecosystem Services*, *12*, 1-15. doi: 10.1016/j.ecoser.2014.12.007

Saphores, J. D. M., Ogunseitan, O. A., & Shapiro, A. A. (2012). Willingness to engage in a pro-environmental behavior: An analysis of e-waste recycling based on a national survey of US households. *Resources, conservation and recycling*, *60*, 49-63.

Schaal, S., Schaal, S., & Lude, A. (2015). Digital geogames to foster local biodiversity. *International Journal for Transformative Research*, *3*(1), 16-29.

Schild, R. (2016). Environmental citizenship: What can political theory contribute to environmental education practice?. *The Journal of Environmental Education*, *47*(1), 19-34.

Schindel Dimick, A. (2015). Supporting youth to develop environmental citizenship within/against a neoliberal context. *Environmental Education Research*, *21*(3), 390-402.

Schinkel, A. (2009). Justifying compulsory environmental education in liberal democracies. *Journal of Philosophy of Education*, *43*(4), 507-526.

Schneider, R., Stoner, K., Steinauer, G., Panella, M., & Humpert, M. (2011). The Nebraska natural legacy project. Retrieved from http://outdoornebraska.gov/wp-content/uploads/2015/09/NebraskaNaturalLegacyProject2ndEdition.pdf

Schoenefeld, J. J., & McCauley, M. R. (2016). Local is not always better: the impact of climate information on values, behavior and policy support. *Journal of Environmental Studies and Sciences*, *6*(4), 724-732.

Schüle, S. A., Gabriel, K. M., & Bolte, G. (2017). Relationship between neighbourhood socioeconomic position and neighbourhood public green space availability: An environmental inequality analysis in a large German city applying generalized linear models. *International Journal of Hygiene and Environmental Health*.

Schwartz, M. D., Beaubien, E. G., Crimmins, T. M., & Weltzin, J. F. (2013). North America. In *Phenology: an integrative environmental science* (pp. 67-89). Springer Netherlands.

Scoville, C. (2016). George Orwell and ecological citizenship: moral agency and modern estrangement. *Citizenship Studies*, 1-16. doi: 10.1080/13621025.2016.1192105

Seifert, J. M., & Shaw, B. R. (2013). Tending our patch of creation: Engaging christians in environmental stewardship through sense of place. *Journal for the Study of Religion, Nature & Culture*, *7*(3).

Sengupta, M., Maji, P. K., & Sengupta, D. (2014). Ecological citizenship behaviour (ECB) in the context of domestic waste management: A case study on sustainability in Kolkata Municipal Corporation. *Indian Journal of*, *3*, 81-90.

Sequoia and Yosemite National Parks, 16 U.S.C. §§ 41-79-1 (2016).

Seyfang, G. (2005). Shopping for sustainability: Can sustainable consumption promote ecological citizenship?. *Environmental politics*, *14*(2), 290-306.

Seyfang, G. (2006). Ecological citizenship and sustainable consumption: Examining local organic food networks. *Journal of rural studies*, *22*(4), 383-395. doi: 10.1016/j.jrurstud.2006.01.003

Shapiro, H. G., Erickson, K. A., Peterson, M. N., Frew, K. N., Stevenson, K. T., & Langerhans, R. B. (2016). Which species to conserve: Evaluating children's species-based conservation priorities. *Biodiversity and Conservation*, *25*(3), 539-553. doi: 10.1007/s10531-016-1067-0

Sherval, M., Askland, H. H., Askew, M., Hanley, J., Farrugia, D., Threadgold, S., & Coffey, J. (2018). Farmers as modern-day stewards and the rise of new rural citizenship in the battle over land use. *Local Environment*, *23*(1), 100-116. doi: 10.1080/13549839.2017.1389868

Shuey, E. A., & Leventhal, T. (2017). Pathways of risk and resilience between neighborhood socioeconomic conditions and parenting. *Children and Youth Services Review, 72*, 52-59.

Shwartz, A., Turbé, A., Simon, L., & Julliard, R. (2014). Enhancing urban biodiversity and its influence on city-dwellers: An experiment. *Biological Conservation, 171*, 82-90. doi: 10.1016/j.biocon.2014.01.009

Silvertown, J., Buesching, C. D., Jacobson, S. K., & Rebelo, T. (2013). Citizen science and nature conservation. *Key topics in conservation biology*, *2*, 127-142.

Sinatra, G. M., Kardash, C. M., Taasoobshirazi, G., & Lombardi, D. (2012). Promoting attitude change and expressed willingness to take action toward climate change in college students. *Instructional Science*, *40*(1), 1-17.

Smith, P. (2014). Do grasslands act as a perpetual sink for carbon?. *Global change biology*, *20*(9), 2708-2711.

Smith, W., & Gough, A. (2015). Can environment students in secondary schools embrace a deep ecology philosophy?. In *ACES 2015* (pp. 1-6). PRESDA Foundation.

Snodgrass, C. E., & Gates, L. (1998). Doctrinal orthodoxy, religious orientation, and anthropocentrism. *Current Psychology*, *17*(2), 222-236.

Soga, M., & Gaston, K. J. (2016). Extinction of experience: The loss of human–nature interactions. *Frontiers in Ecology and the Environment*, *14*(2), 94-101. doi: 10.1002/fee.1225

Soga, M., Gaston, K. J., Yamaura, Y., Kurisu, K., & Hanaki, K. (2016). Both direct and vicarious experiences of nature affect children's willingness to conserve

biodiversity. *International Journal of Environmental Research and Public Health*, *13*(6), 529. doi: 10.3390/ijerph13060529

Soranno, P. A., Cheruvelil, K. S., Elliott, K. C., & Montgomery, G. M. (2015). It's good to share: Why environmental scientists' ethics are out of date. *BioScience*, *65*(1), 69-73.

Sorensen, A. E., & Jordan, R. C. (2016). Impacts and implications of researcher identity and academic practice: Future directions for public engagement and ecological research. *Human Ecology*, *44*(3), 375-391.

South Dakota Department of Game, Fish, and Parks. (2014). State wildlife action plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

Spaargaren, G., & Oosterveer, P. (2010). Citizen-consumers as agents of change in globalizing modernity: the case of sustainable consumption. *Sustainability*, *2*(7), 1887-1908.

Spínola, H. (2015). Environmental literacy comparison between students taught in eco-schools and ordinary schools in the Madeira Island Region of Portugal. *Science Education International*, *26*(3), 392-413.

Spirn, A. W. (2014). Ecological urbanism: A framework for the design of resilient cities (2014). In *The Ecological Design and Planning Reader* (pp. 557-571). Island Press/Center for Resource Economics.

Stapleton, S. R. (2015). Environmental identity development through social interactions, action, and recognition. *The Journal of Environmental Education*, *46*(2), 94-113.

Steg, L. (2016). Values, norms, and intrinsic motivation to act proenvironmentally. *Annual Review of Environment and Resources*, *41*, 277-292.

Stern, P. C. (2000). Towards a coherent theory of environmentally significant behavior. *Journal of Social Issues*, *56*, 407-424.

Stern, P. C., Dietz, T., Abel, T. D., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human ecology review*, *6*(2), 81-97.

Strachan, L., Fraser-Thomas, J., & Nelson-Ferguson, K. (2016). An ecological perspective on high performance sport and positive youth development. In *Positive Youth Development Through Sport*, 57. New York: Routledge

Stretesky, P. B., & Lynch, M. J. (2009). A cross-national study of the association between per capita carbon dioxide emissions and exports to the United States. *Social Science Research*, *38*(1), 239-250. doi: 10.1016/j.ssresearch.2008.08.004

Sudbury-Riley, L., Hofmeister-Toth, A., & Kohlbacher, F. (2014). A cross-national study of the ecological worldview of senior consumers. *International Journal of Consumer Studies*, *38*(5), 500-509.

Sullivan, B. L., Aycrigg, J. L., Barry, J. H., Bonney, R. E., Bruns, N., Cooper, C. B., ... & Fink, D. (2014). The eBird enterprise: an integrated approach to development and application of citizen science. *Biological Conservation*, *169*, 31-40.

Taylor, S. J., Bogdan, R., & DeVault, M. (2015). *Introduction to qualitative research methods: A guidebook and resource*. John Wiley & Sons.

Thomas, G. (2015). *How to do your case study*. Sage.

Thoreau, H.D. (2011). *Walden*. New York: Simon & Brown

Tidball, K. G., & Krasny, M. E. (2011). Urban environmental education from a social-ecological perspective: Conceptual framework for civic ecology education. *Cities and the Environment (CATE), 3*(1), 11.

Tilman, D., & Clark, M. (2015). Food, agriculture & the environment: Can we feed the world & save the Earth?. *Daedalus*, *144*(4), 8-23.

Travaline, K., & Hunold, C. (2010). Urban agriculture and ecological citizenship in Philadelphia. *Local Environment*, *15*(6), 581-590.

Turaga, R. M. R., Howarth, R. B., & Borsuk, M. E. (2010). Pro-environmental behavior. *Annals of the New York Academy of Sciences*, *1185*(1), 211-224.

Twedt, E., Rainey, R. M., & Proffitt, D. R. (2016). Designed natural spaces: Informal gardens are perceived to be more restorative than formal gardens. *Frontiers in psychology*, *7*.

Uehara, L., Button, C., Falcous, M., & Davids, K. (2016). Contextualised skill acquisition research: A new framework to study the development of sport expertise. *Physical Education and Sport Pedagogy*, *21*(2), 153-168.

United Nations. (2016). *Paris Agreement*. Paris: United Nations, pp 1-27.

United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Convention on Biological Diversity*, UNEP.Bio.Div./CONF/L.2 (Dec. 29, 1993).

United Nations Environment Programme. (2012). *Global environment outlook 5*. Retrieved from http://web.unep.org/geo/sites/unep.org.geo/files/documents/geo5_report_full_en_0.pdf

United Nations Environmental Programme. (2012). Human rights and the environment: Rio+20 joint report OHCHR and UNEP. Retrieved from http://web.unep.org/environmentalgovernance/resources/publications

United Nations. (n.d.). United Nations sustainable development goals. Retrieved from https://sustainabledevelopment.un.org/?menu=1300

Valencia Sáiz, Á. (2005). Globalisation, cosmopolitanism and ecological citizenship. *Environmental politics*, *14*(2), 163-178.

Van den Born, R. J., Lenders, R. H., De Groot, W. T., & Huijsman, E. (2001). The new biophilia: an exploration of visions of nature in Western countries. *Environmental conservation*, *28*(01), 65-75.

Van der Werff, E., Steg, L., & Keizer, K. (2013). It is a moral issue: the relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behaviour. *Global environmental change*, *23*(5), 1258-1265.

van Riper, C. J., & Kyle, G. T. (2014). Understanding the internal processes of behavioral engagement in a national park: A latent variable path analysis of the value-belief-norm theory. *Journal of Environmental Psychology*, *38*, 288-297.

von Hertzen, L., Beutler, B., Bienenstock, J., Blaser, M., Cani, P. D., Eriksson, J., ... & Kere, J. (2015). Helsinki alert of biodiversity and health. *Annals of medicine*, *47*(3), 218-225. doi: 10.3109/07853890.2015.1010226

von Meyer-Höfer, M., von der Wense, V., & Spiller, A. (2015). Characterising convinced sustainable food consumers. *British Food Journal*, *117*(3), 1082-1104.

Vroom, V. (1964). Expectancy theory. *Work and motivation*.

White, L. (1967). The historical roots of our ecological crisis. *This sacred earth: religion, nature, environment*, 184-193.

White, R. (2004). Young children's relationship with nature: Its importance to children's development & the earth's future. *White Hutchinson Leisure & Learning Group*, 1-9.

Wilson, E. O. (2009). *Biophilia*. Cambridge, U.S.: Harvard University Press.

Witkowski, T. H. (2016). Mythical moments in Remington brand history. *Culture and Organization*, *22*(1), 44-66.

Wolf, J., & Statham, A. (2008). Working together to protect ecological diversity: A community-based learning case study at University of Wisconsin–Parkside. *Journal of Higher Education Outreach and Engagement*, *12*(3), 33-46.

Wolf, J., Brown, K., & Conway, D. (2009). Ecological citizenship and climate change: perceptions and practice. *Environmental Politics*, *18*(4), 503-521.

Wonneberger, A. (2017). Environmentalism—A question of guilt? Testing a model of guilt arousal and effects for environmental campaigns. *Journal of Nonprofit & Public Sector Marketing*, 1-19. doi: 10.1080/10495142.2017.1326873

World Heritage Convention, 1972, 1037 U.N.T.S. 151; 27 U.S.T. 37; 11 I.L.M. 1358.

Wright, J. (2015). It's not easy being green: an investigation into the effectiveness of ecological citizenship as an explanation for pro-environmental behaviour. *Diffusion-The UCLan Journal of Undergraduate Research*, *5*(1).

WWF. (2016). Living planet report 2016: Risk and resilience in a new era. Gland, Switzerland: WWF International.

Xue, W., & Zhao, S. (2015). The environmental worldviews and climate change mitigation behaviors: testing the new ecological scale in the smallest space analysis for Chinese samples. *International Journal of Environmental Science and Development*, *6*(7), 547.

Yeboah, F. K., & Kaplowitz, M. D. (2016). Explaining energy conservation and environmental citizenship behaviors using the Value-Belief-Norm Framework. *Human Ecology Review*, *22*(2), 137.

Yellowstone National Park Protection Act of 1872, 16 U.S.C. §§ 21-40c (2016).

Young, R. A. (1983). Career development of adolescents: An ecological perspective. *Journal of youth and adolescence*, *12*(5), 401-417.

Zhang, W., Goodale, E., & Chen, J. (2014). How contact with nature affects children's biophilia, biophobia and conservation attitude in China. *Biological Conservation*, *177*, 109-116.

Zohrer, J. J. (2006). The Iowa comprehensive wildlife action plan. *Iowa Department of Natural Resources, Des Moines*.

Appendix A: Survey

Question # (Item #)	Question or Item Wording
1	I understand my rights and want to participation in this study
2	How much do you agree or disagree with the following statements?
2 (1)	We are approaching the limit of the number of people the earth can support
2 (2)	Humans have the right to modify the natural environment to suit their needs
2 (3)	When humans interfere with nature it often produces disastrous consequences
2 (4)	Human ingenuity will insure that we do NOT make the earth unlivable
2 (5)	Humans are severely abusing the environment
2 (6)	The Earth has plenty of natural resources if we just learn how to develop them
2 (7)	Plants and animals have as much right as humans to exist
2 (8)	The balance of nature is strong enough to cope with the impacts of modern industrial nations
2 (9)	Despite our special abilities humans are still subject to the laws of nature
2 (10)	The so-called “ecological crisis” facing humankind has been greatly exaggerated
2 (11)	The earth is like a spaceship with very limited room and resources
2 (12)	Humans were meant to rule over the rest of nature
2 (13)	The balance of nature is very delicate and easily upset
2 (14)	Humans will eventually learn enough about how nature works to be able to control it
2 (15)	If things continue on their present course, we will soon experience a major ecological catastrophe
3	How willing are you to do the following?
3 (1)	I’m willing to use stop using plastic grocery bags and use recycled bags instead
3 (2)	I’m willing to stop buying bottled water because the manufacturing process for plastic water bottles is carbon intensive
3 (3)	I’d be willing to carpool
3 (4)	I’m willing to pay a .50 cents surcharge per gallon of gas to go toward greenhouse gas reduction
3 (5)	I’m willing to reduce the numbers of hours a week I use electronic devices (computer, cell phone, TV, etc.)

3 (6)	I'm willing to plant native plants in order to improve the environmental health of the U.S. Grasslands
4	How much do you agree or disagree with the following statements?
4 (1)	The ecological health of the U.S. Grasslands is the shared responsibility of landowners, agencies, organizations, and communities within the region.
4 (2)	State-based conservation efforts are dependent on public support.
4 (3)	Conservation in the U.S. Grasslands is best served through state and organization partnerships.
4 (4)	Residents of the Grasslands are responsible for reducing food waste through sustainable consumption.
4 (5)	The state government pressures residents to adopt ecological behavior.
4 (6)	Organizations try to make state residents feel guilty for not engaging in environmental behavior.
4 (7)	The state government should pay residents to demonstrate environmental behavior.
4 (8)	Buying goods in the U.S. negatively impacts the environment in other countries.
4 (9)	Consumers are obligated to consider the production worker's rights when buying goods produced outside of the U.S.
4 (10)	Consumers are obligated to consider future generations when making purchases.
4 (11)	Environmental polluters should be taxed on their pollution to pay for correcting their environmental damage.
4 (12)	Citizens should have environmental authority in your state.
5	Does your state government ensure all residents have equal access to natural resources in the U.S. Grasslands? Why or why not?
6	All state wildlife action plans highlight the need for partnerships between state agencies (i.e. Department of Wildlife), environmental organizations (i.e. Ducks Unlimited), and other interested parties (e.g., Colleges and Universities). These partnerships create and implement state-wide conservation projects that benefit the region. Do state partnerships promote public participation when developing environmental policies and programs? Why or why not?
7	Do environmental organizations within your state offer enough opportunities so that all residents, regardless of age, income, or location, can participate in environmental activities? Why or why not?
8	What is your age?
9	What is your sex?

10	Which race/ethnicity best describes you? (Please choose only one)
11	What is the highest level of school you have completed or the highest degree you have received?
12	In general, how would you describe your political party affiliation?
13	Which of the following best describes your political values?