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An Investigation into Factors Influencing Attitude Toward a Wildlife Corridor

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AN INVESTIGATION INTO FACTORS INFLUENCING ATTITUDE TOWARD A WILDLIFE CORRIDOR

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Habitat fragmentation poses a serious threat to biodiversity in eastern Nebraska. Today, over 98% of Nebraska's tall-grass prairie has been lost and what remains exists mostly as remnants less than 80 acres in size. The Prairie Corridor on Haines Branch will be one of the first human-made wildlife corridors in eastern Nebraska with expansion of prairie habitat as one of its main goals. Although still in the planning stages, the Prairie Corridor is a rare opportunity to explore public attitude toward a conservation-related program prior to its official launch. The purpose of this study is to explore the potential relationship between attitude toward a wildlife corridor, connection to nature, environmental values, and norms, thus providing some insight into the general willingness to support conservation-related programs such as wildlife corridors. Park visitors and residents currently living near an existing wildlife corridor were asked to complete a survey measuring attitudes, connection to nature, environmental values and norms. In total, 152 park visitors and 272 residents completed the survey. Overall, park visitors had a significantly higher attitude toward a wildlife corridor than did residents. In addition, Pearson correlations showed that connection to nature and attitude toward a wildlife corridor were significantly correlated. Altruistic environmental values, biospheric environmental values and personal and social norms were also significantly correlated with attitude toward a wildlife corridor. Multiple regression analysis was used

to test if connection to nature, environmental values, norms or demographics significantly predict attitude toward a wildlife corridor for all participants. The results of the analysis indicated these predictors explained 41.4% of the variance. Personal norms significantly predicted attitudes toward a wildlife corridor, as did biospheric environmental values. In addition, biospheric environmental values were identified as a significant predictor among rural residents living near an existing wildlife corridor, suggesting this population (which most closely resembles the targeted population for the Prairie Corridor) would be more likely to favor participating in something they perceive as beneficial to the environment. Therefore, the results of this study suggest further research regarding attitude toward a wildlife corridor is needed.

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CHAPTER 1

Introduction

In the last 400 years, over 1,100 species of plants and animals have gone extinct (Foreman, 2004). This rate is over 1000 times greater than the natural rate of extinction. Considering the importance of biodiversity to the overall health of the ecosystems upon which we depend, this rapid loss is alarming. Ecosystems provide us with a variety of essential services, many of which would be expensive (if not impossible) to replace.

Currently, over 25% of mammals, 13% of birds, and 41% of amphibians are threatened worldwide (IUCN, 2013). Over 3,800 invertebrates and 10,000 plants are listed as threatened as well. Although it is uncertain what impact the loss of any one species would have on an ecosystem, there is little doubt that ecosystem functions would become increasingly more disrupted as more and more species are removed. Therefore, protecting threatened species and promoting biodiversity worldwide should be of the utmost priority.

Traditionally, habitat destruction has been the biggest threat to biodiversity. Over 50% of temperate and tropical rainforests worldwide have been lost due to deforestation (Hassan, Scholes, & Ash, 2005). It has been estimated that half of all freshwater wetlands have been lost as well. In addition, approximately 20% of coral reefs have been destroyed and another 20% have been severely degraded due to pollution and overfishing.

Many have recognized habitat destruction as a serious threat in recent years, leading to a worldwide effort to better manage our natural resources. Habitat destruction has slowed in many countries. Some have even made a significant effort to restore habitat through replanting (Hassan et al., 2005). Unfortunately, what habitat remains tends to

exist as small patches scattered throughout a matrix of human development. As a result, habitat fragmentation is considered one of the biggest threats to biodiversity today.

Research has shown that habitat fragmentation reduces species richness and taxon diversity. Not only does habitat fragmentation reduce the amount of functional habitat available, it divides wildlife populations into smaller subpopulations. Many of these populations are at risk of local extinction, particularly those already close to the minimum viable population size (Hogan, 2014). Consequently, some species simply fail to exist when confronted with intense levels of habitat fragmentation (Alexander, Waters, & Paquet, 2004).

Although not widely recognized, habitat fragmentation poses a serious threat to biodiversity in eastern Nebraska. Over 98% of tall-grass prairie has already been lost and what remains exists mostly as remnants less than 80 acres in size (Schneider, Stoner, Steinauer, Panella, & Humpert, 2011). The biggest players in habitat loss and fragmentation in eastern Nebraska are cropland and urban development.

Over the last few decades, wildlife corridors have been of great interest to conservation biologists. Wildlife corridors create connections between isolated patches of habitat, facilitating the movement of wildlife. They also provide opportunities for foraging, breeding, or refuge (Perault & Lomolino, 2000). Most wildlife corridors in eastern Nebraska are naturally occurring strips of riparian habitat along rivers and large creeks. However, the planning process is currently underway for the Lincoln, Nebraska Prairie Corridor on Haines Branch, which will connect the City of Lincoln's Pioneers Park Nature Center and the National Audubon Society's Spring Creek Prairie. The corridor will be one of the first human-made wildlife corridors in eastern Nebraska with

expansion of prairie habitat as one of its main goals (Salt Valley Greenway and Prairie Corridor, 2012).

Although completion of the Prairie Corridor is expected to take 15 years or more, supporters are optimistic that its benefits will not come too late. Not only will the corridor connect two existing remnants of tall-grass prairie, it will increase the total area as well. Planners are hopeful that this total increase will create a habitat capable of supporting tall-grass prairie species with large area requirements such as the greater prairie chicken, northern harrier, and short-eared owl (Salt Valley Greenway and Prairie Corridor, 2012).

Conservation-related programs are often the subject of human dimensions of natural resource management studies post-implementation. However, since the Prairie Corridor is still in the planning stages, this is a rare opportunity to explore public attitudes toward a conservation-related program prior to its official launch. The general consensus is that public support of conservation-related programs increases their chance for success. Unfortunately, most studies explore public attitudes toward long-standing policies and programs (Johansson & Henningsson, 2011; Moon, Marshall, & Cocklin, 2012). This study will be somewhat unique because public attitudes toward a conservation-related program (e.g. the Prairie Corridor on Haines Branch) will be accessed before implementation.

Purpose Statement

The purpose of this study is to explore the potential relationship between attitude toward a wildlife corridor and connection to nature, providing some insight into the general willingness to support conservation-related programs. Although connection to nature is relatively new to the field of environmental conservation, the concept itself has

been around for well over 60 years. In 1949, Aldo Leopold argued that people must feel connected with nature before they can feel responsible for it. Connection to nature, however, did not fully emerge as a social science concept until the early part of this century. Despite this, several studies have already identified a significant relationship between environmental concern and connection to nature (Dutcher, Finley, Luloff, & Buttolph Johnson, 2007; Bruni & Schultz, 2010; Gosling & Williams, 2010; Kaiser, Hartig, Brugger, & Duvier, 2011).

Some believe that connection to nature may even be used to predict whether an individual will engage in pro-environmental behaviors (Mayer, McPherson Frantz, Bruehlman-Senecal, & Dolliver, 2009). This would include ecological behaviors such as supporting or participating in conservation efforts (Kaiser et al., 2011). Unfortunately, it is unknown what (if any) underlying factors may be influencing the relationship between connection to nature and pro-environmental behaviors. Therefore, this study will also explore whether two other social science concepts – environmental values and norms – influence the correlation between attitude toward a wildlife corridor and connection to nature.

Limitations

This study has some limitations that could not be avoided. Local officials raised strong concerns about including residents living along the proposed corridor route. Therefore, this study was unable to survey those individuals most affected by the implementation of the wildlife corridor. In addition, it is unknown how much knowledge participants had about the proposed corridor prior to completing the survey. Participants that were unfamiliar with the topic may not have already formed attitudes and based their

answers to those questions on the information provided on the survey, which could have affected the results.

Research Questions

1. Do certain segments of the population (i.e. residents or park visitors) have a more favorable attitude toward a wildlife corridor than others?
2. Is there a correlation between connection to nature, environmental values, and/or norms and attitude toward a wildlife corridor?
3. Are there factors (i.e. environmental values or norms) that influence the relationship between attitude toward a wildlife corridor and connection to nature?

Background Information

Habitat Fragmentation

One of the biggest threats to biodiversity today is habitat fragmentation (Bona, Badino, & Isaia, 2006). According to Hogan (2014), habitat fragmentation is defined as the "alteration of habitat resulting in a spatial separation of habitat units from a previous state of greater continuity" (para. 1). In addition, habitat fragmentation is the result of two processes occurring simultaneously: 1) the loss of overall habitat area, and 2) the division of the remaining habitat area into isolated patches (Hu, Wu, Feeley, Xu, & Yu, 2012).

Normally this is a naturally-occurring phenomenon which takes place over long periods of time or, rarely, over shorter periods of time through catastrophic events (e.g. floods, landslides, earthquakes, or volcanic eruptions) (Alexander et al., 2004). Most wildlife species have evolved a resilience which allows them to adapt to the changes that result. In the Holocene era, however, humans have been dramatically altering the

landscape at an alarming rate (Hogan, 2014). The result has been a level of habitat fragmentation that is unprecedented in natural systems (Alexander et al., 2004).

Habitat fragmentation today is primarily the result of agricultural land conversion, urbanization, pollution, deforestation, and the introduction of invasive species (Hogan, 2014). The landscape has been covered in networks consisting of roads, railroads, and power lines which reach out and cut through even the most remote areas (Alexander et al., 2004). Of these networks, roads may have the largest disturbance effect (Noss and Csuti, 1997). In addition to habitat loss and isolation, roads create a deadly hazard to wildlife attempting to get across. This creates what is known as a barrier effect, which prevents wildlife from moving from one segment of habitat to another.

Research has shown that habitat fragmentation reduces species richness and taxon diversity, which can lead to a disruption in ecosystem functioning and a reduction in its efficacy (Hogan, 2014). Not only does habitat fragmentation reduce the amount of functional habitat, it divides wildlife populations up into smaller subpopulations. These populations are at risk of local extinction if they are already near the minimum viable population size. Consequently, some species simply fail to exist when confronted with the intense levels of habitat fragmentation that we are experiencing today (Alexander et al., 2004).

For those species that do persist, some may have insufficient dispersal abilities to travel from one patch of habitat to the next (Hogan, 2014). These species may suffer from genetic drift or inbreeding because the gene flow has been restricted. As a result, re-colonization of other subpopulations would become difficult, preventing them from being rescued from local extinction. Furthermore, even species exhibiting adequate dispersal

strength may not be immune to the effects of habitat fragmentation. They often suffer from the insufficient dispersal and survival of those species upon which they rely for their own survival.

Habitat Fragmentation: Eastern Nebraska

Historically, tall-grass prairie was the dominant plant community of eastern Nebraska (Johnsgard, 2007). Tall-grass prairie is characterized by the presence of tall grasses such as Indian grass, switchgrass, and big bluestem. However, most abundant in this community are mid-height grasses such as little bluestem, side-oats grama, and prairie drop-seed. In addition, this community hosts hundreds of species of wildflowers and other forbs. Most abundant are sunflower, prairie goldenrod, heath aster, and daisy fleabane. There are also some shrub-like species such as leadplant and prairie rose.

In addition, eastern Nebraska hosts a diversity of less abundant plant communities ranging from deciduous woodlands to wetlands (Schneider et al., 2011). Deciduous woodlands are found along fire-protected stream valleys and around bluffs. The most abundant trees are cottonwood, willow, boxelder, and elm. However, drier bluffs may also support hickory, oak, and walnut. Along edges of woodlands, shrubby communities are also fairly common (Johnsgard, 2007). Abundant shrubs include sumac, dogwood, and wild plum.

Wetlands in eastern Nebraska are diverse as well (Schneider et al., 2011). Wet meadows are found along stream valleys where the water table is high throughout the year. Sedges, prairie cordgrass, and spikerush are common in these communities. Marshes, on the other hand, are found in river floodplains. Abundant marsh plants include cattail, smartweed, and bulrush. Rarer are the saline wetlands, which are found

only along Salt Creek and its tributaries in southeastern Nebraska. The salty soils of these wetlands support a variety of saline-tolerant plants.

Tall-grass prairie and other plant communities of eastern Nebraska provide habitat for a seemingly endless variety of wildlife species (Schneider et al., 2011). This area provides habitat for over 300 bird, 75 fish, 55 mammal, 40 reptile, 13 amphibian, and countless invertebrate species. Perhaps most prominent are the greater prairie chicken, Henslow's sparrow, Bell's vireo, white-tailed deer, coyote, northern painted turtle, and plains garter snake. Prior to European settlement, this area was also home to large mammals such as elk, bison, mountain lion, black bear, and gray wolf.

Although not widely recognized, habitat fragmentation poses a serious threat to biodiversity in eastern Nebraska (Schneider et al., 2011). Tall-grass prairie once extended from eastern Nebraska to Indiana and from southern Canada to Texas. Today, less than one percent of tall-grass prairie remains in the continental United States. In Nebraska, over 98% of tall-grass prairie has been lost and what remains exists mostly as remnants less than 80 acres in size. Also critically endangered are the saline wetlands, which have been reduced to small patches totaling only 1,400 acres (Salt Valley Greenway and Prairie Corridor, 2012).

Agriculture has been the biggest player in habitat loss and fragmentation in eastern Nebraska (Schneider et al., 2011). Tall-grass prairie has been converted to cropland dedicated to growing corn, soybeans, wheat, and alfalfa. Much of Nebraska's pork, poultry, and dairy industries are located in this portion of the state as well. Furthermore, farms have become fewer in number and larger in size in recent decades.

This has led to fewer people being employed directly by agriculture, forcing more and more rural residents to move to urban areas in search of employment.

The cities of Lincoln and Omaha, the two largest urban centers in Nebraska, are also located in the eastern portion of the state. According to the United States Census Bureau (2010), the city of Lincoln encompasses 89 square miles and has a current population of 258,379, while the city of Omaha encompasses 127 square miles and has a current population of 408,958. However, both of these urban centers are actually much larger when the surrounding communities are taken into account. This is particularly true for Omaha, which is surrounded by several communities including Bellevue, Papillion, and La Vista.

Wildlife Corridors

Over the last few decades, wildlife corridors have been of great interest to conservation biologists (Perault & Lomolino, 2000). According to Kindall and Van Manen (2007), wildlife corridors can be defined as "linear patches of land that connect similar patches, but differ from the surrounding land-cover matrix" (p. 487). Wildlife corridors permit movement between isolated patches of habitat (Perault & Lomolino, 2000). These movements can be short (e.g. daily excursions in search of food), involve relocations (e.g. seasonal migrations or natal dispersal), or encompass biogeographic scales. In addition, corridors may provide opportunities for foraging, breeding, or refuge.

Many have debated the role wildlife corridors play in minimizing the effects of habitat fragmentation (Perault & Lomolino, 2000). The idea that wildlife corridors could help maintain natural levels of connectivity among subpopulations in areas of highly fragmented habitat is appealing to conservation biologists. Still, the efficacy of wildlife

corridors needs to be assessed on a case-by-case basis because there are some situations in which wildlife corridors are not beneficial (Sinclair, Fryxel, & Caughley, 2006). Interestingly, many of the conservation practices related to wildlife corridor design have been based solely on theory because studies at the landscape-level scale have been lacking (Perault & Lomolino, 2000). However, the few studies that do exist have shown promise in demonstrating the value of wildlife corridors in conservation efforts (Kindall & Van Manen, 2007).

Wildlife Corridors: Eastern Nebraska

Eastern Nebraska is dotted with designated areas of wildlife habitat, both privately and publically owned. Well-known examples include Platte River State Park, Mahoney State Park, Schramm Park State Recreation Area, DeSoto and Boyer Chute National Wildlife Refuges, Homestead National Monument, Fontenelle Forest, and Glacier Creek Preserve. Other examples include Nature Conservancy and Audubon-owned lands.

Several of these areas are connected through a natural corridor such as a river or large creek that runs between them. However, this type of corridor typically consists of riparian habitat. Although some wildlife species (i.e. generalists) may be able to utilize these corridors, many others (i.e. specialists) may not (Bakker, 2003). Prairie chickens and other grassland birds, for example, tend to avoid woodland areas and even grassland areas immediately adjacent to woodland areas.

The Prairie Corridor on Haines Branch, on the other hand, will be one of the first human-made wildlife corridors in eastern Nebraska with expansion of prairie habitat as one of its main goals (Salt Valley Greenway and Prairie Corridor, 2012). Currently in the

planning process, the corridor will join two prairie preserves: Pioneers Park Nature Center and Spring Creek Prairie. Although a portion of the corridor will utilize riparian and wetland habitat along a portion of Haines Branch, about half of the 7,310 acres making up the corridor will consist of both virgin and restored tall-grass prairie.

According to the Minnesota Prairie Conservation Plan (2011), the best way to rehabilitate prairie is to build from concentrations of existing remnants. Pioneers Park Nature Center and Spring Creek Prairie are two existing remnants relatively close to one another (Salt Valley Greenway and Prairie Corridor, 2012). Yet they are disconnected due to a fragmented landscape. The Prairie Corridor would not only link these two areas, but expand the total area of tall-grass prairie as well. In addition, the corridor would provide linkages between a variety of different habitats within the area.

Given the habitat preferences of many grassland birds, it is unlikely these species will use the corridor to travel from one remnant of tall-grass prairie to the other. Despite this shortcoming, however, the Prairie Corridor is believed to meet all nine biological attributes of a functional prairie (as described in the Minnesota Prairie Conservation Plan, 2011). Most notable is theory that the corridor will help create a habitat capable of supporting species with large area requirements such as the greater prairie chicken, northern harrier, and short-eared owl (Salt Valley Greenway and Prairie Corridor, 2012). Therefore, even if these species do not use the corridor in its entirety, they may still benefit.

Collaborative Management

Collaborative governance is defined as "a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-

making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (Ansell & Gash, 2008, p. 544). This definition is useful in that it distinguishes collaborative governance from other forms of governance such as managerialism, where stakeholders may be "consulted" but they do not play an active role in the decision-making process.

In natural resources management, collaborative governance is often referred to as collaborative management or planning (Lum, 2009). In the 1990s, the decision-making process for environmental issues began to shift from public hierarchies to collaborative arrangements that include stakeholders from a variety of different organizations from both the public and private sectors (Koontz & Thomas, 2006). During this time, for example, the U.S. Environmental Protection Agency (EPA) launched its Community-Based Environmental Program and the U.S. Forest Service began emphasizing collaborative planning with stakeholders.

This rise of collaborative management is thought to be a reflection of changing environmental and social issues (Koontz & Thomas, 2006). For many modern environmental issues (e.g. non-point source pollution), federal-based efforts have proved ineffective in mitigating or solving problems. Meanwhile, a growing distrust in the ability of government agencies to make important decisions has led to more and more efforts to increase stakeholder involvement in the policy making process (Koontz & Thomas, 2006; Cortner & Moore, 1999). As a result, not all arrangements formed are initiated by public agencies (Eckerberg, Bjarstog, & Zachrisson, 2015; McGuire, 2006). Some are "bottom-up", where collaborative efforts are initiated by non-government entities.

The Prairie Corridor on Haines Branch is described as a collaborative management effort between the City of Lincoln, Lincoln Parks and Recreation Department and the Audubon Society (Salt Valley Greenway and Prairie Corridor, 2012). Other stakeholders include Lancaster County and City of Denton government agencies, Lower Platte South Natural Resources District, Nebraska Environmental Trust and the Lincoln Parks Foundation. In addition, the project has sought input from local citizens who live along the proposed corridor.

CHAPTER 2

Literature Review

Attitudes

Fazio, Chen, McDonel, and Sherman (1982) defined attitudes as an association of an evaluation (i.e. positive or negative) with an object (i.e. a person, place, thing, event, or idea). Attitudes can be complex and, at times, even contradictory (Wilson, Lindsey, & Schooler, 2000). Most researchers believe they can form spontaneously during a given situation. However, attitudes can also be stored in memory and retrieved during applicable situations (Schwarz & Bohner, 2001). Some attitudes can remain in memory for a lifetime, while others are quickly forgotten.

Some theorists believe attitudes consist of three different components, which may help explain the level of complexity attitudes often exhibit (Rokeach, 1968; Zanna & Rempel, 1988). The affective component arises from the set of emotions a person feels toward an object. Conversely, the cognitive component involves the beliefs a person holds toward an object. Finally, the conative component involves behavior surrounding an object. Interestingly, someone may possess one, two, or all three of these components toward an object.

These components will often combine, allowing a person to develop a general evaluation toward an object (Schwarz & Bohner, 2001). Over time, this general evaluation will reshape its components to increase the correlation between the attitude and the feelings, beliefs, and/or behavior that created it. As a result, a high level of consistency may exist among these components. However, they are not always consistent and may even be contradictory (Gawronski & Boenhausen, 2006; Smith & DeCoster,

2000). This suggests that it is possible for multiple attitudes to be associated with a single object.

Attitudes: Wildlife corridors and other conservation areas

Over the past few decades, attitudes toward wilderness areas and their management have been evolving. Prior to the 1990s, however, there was little interest in exploring these attitudes. Rudzitis and Johansen (1991) were among the first to investigate attitudes toward wilderness areas. Their study focused on both short and long-term residents living in counties containing wilderness areas within their boundaries. Overall, those surveyed exhibited a positive attitude toward the wilderness areas with many citing it as having a strong influence over their decision to live there. In addition, a majority of respondents were opposed to opening the wilderness area up to natural resource extraction.

Later studies expanded their focus to include attitudes toward the values or benefits of wilderness areas including wildlife habitat, protection of endangered species, and ecosystem services. Cordell, Tarrant, McDonald, and Bergstrom (1998) found a majority of survey respondents ranked protecting water quality, wildlife habitat, and air quality of highest importance. Protection for endangered species and preserving ecosystems were also ranked highly. Similarly, Clendenning, Field, and Kapp (2005) found wilderness values and endangered species protection were ranked highly among residents living near a wilderness area.

Other studies focused on private landowners and their attitudes toward woodland areas located on their land. In a study conducted by Rickenbach, Kittredge, Dennis, and Stevens (1998), most respondents acknowledged that their land is part of a larger

ecosystem and their actions may have impacts elsewhere. Most respondents agreed or strongly agreed with wildlife-related statements (e.g. *my land provides important wildlife habitat, my land should provide for the needs of future plant and animal populations*, etc.). Several other studies (e.g. Daley, Cobb, Bromley, & Sorenson, 2004; Belin, et al., 2005; Martinez-Espineira & Hallstrom, 2009) found similar results.

Rather than focusing on potential wildlife habitat, many studies focused on specific wildlife species instead. This is particularly true in areas where large predators are present. Attitudes toward wolves, for example, have been thoroughly investigated. Williams, Ericsson, and Heberlein (2002) summarized 37 studies regarding attitudes toward wolves and their reintroduction conducted between 1976 and 2000. In all of these studies, the attitudes varied widely among respondents. Later studies (e.g. Enck & Brown, 2002; Naughton-Treves, Grossberg, & Treves, 2003; Chavez, Gese, & Krannich, 2005) found similar results.

Other species studied include big cats (e.g. Manfredo, Zinn, Sikorowski, & Jones, 1998; Campbell & Lancaster, 2010; Jhamvar-Shingote & Schuett, 2013) and black bears (e.g. Bowman, Leopold, Vilella, & Gill, 2004; Morzillo, Mertig, Garner, & Liu, 2007; Campbell & Lancaster, 2010). In general, respondents in these studies had a mix of both positive and negative attitudes. In addition, many of these studies found that some attitudes were associated with certain demographic and socioeconomic characteristics.

Conversely, some studies focused exclusively on environmental interpretation (e.g. nature centers, visitor centers, nature education programs, etc.). Knapp (1996), for example, found that ecology-based interpretive programs produce more immediate changes in nature center visitor knowledge, attitudes and behavior intentions. Erdogan

(2011) found similar results. Others explored attitudes and outdoor recreation (Tarrant & Green, 1999; Thapa, 2010), ecotourism (Scott & Thigpen, 2003; Powell & Ham, 2008; Skibins, Powell, & Hallo, 2013) and zoo visitors (Adelman, Falk, & James, 2000; Lukas & Ross, 2005; Marino, Lilienfeld, Malamud, Nobis, & Broglio, 2010).

Although previous studies explored attitudes of landowners and park visitors, very few (if any) compared these groups side-by-side. Despite this shortcoming, it seems logical to assume that park visitors would have a more favorable attitude toward a wildlife corridor because they are actively seeking out experiences with nature and wildlife. Residents, on the other hand, may not necessarily choose to live near a wildlife corridor. Furthermore, a park that charges admission (e.g. Spring Creek Prairie) would likely attract more so-called nature enthusiasts, while a park that does not charge admission would likely attract a wider diversity of visitors.

Similarly, very few studies (if any) compare attitudes of urban and rural residents living near a wildlife corridor. However, it has been demonstrated that proximity to a wilderness area can influence homebuying decisions (Rudzitis & Johansen, 1991). Therefore, it stands to reason that rural residents would view wildlife corridors more favorably since they chose to live away from the urban environment. Thus, the following hypotheses were developed.

H1: Park visitors are more likely to possess a favorable attitude toward a wildlife corridor than residents (living near a wildlife corridor).

H2: Spring Creek Prairie visitors are more likely to possess a favorable attitude toward a wildlife a corridor than Pioneers Park Nature Center visitors.

H3: Rural residents (living near a wildlife corridor) are more likely to possess a favorable attitude toward a wildlife corridor than urban residents (living near a wildlife corridor).

Connection to Nature

For much of the twentieth century, the majority of social scientists held the belief that complex human behavior is almost entirely the product of social environment (Tooby & Cosmides, 1992; Pinker, 2002). While humans are biological organisms whose physical traits are the result of millions of years of evolution, our behavioral and psychological characteristics have little to do with genetics. In other words, we are essentially blank slates at birth. It is socialization and enculturation, not biology, which play a huge role in determining who we are and what we think.

Over the past few decades, however, more thought has been given to the potential role of evolutionary theory in the social sciences. This revival can be traced back to E.O. Wilson's work in extending sociobiology, or the study of the biological basis of social behavior, to the evolution of human social behavior. Wilson (1975) argued that although our capacity for culture may be transmitted by a single human genotype, genes still maintain a certain amount of influence over underlying behavioral qualities. Furthermore, moderately high heritability has been documented in human personality and behavioral differences such as introversion-extroversion, dominance, and depression.

From this argument, several perspectives explaining human thought and behavior toward nature have emerged. One well-known perspective, commonly known as the killer ape theory, stemmed from fossil evidence that suggests early hominids actively hunted large mammals for food (Weiss & Mann, 1990). According to this theory, an

evolved hunting lifestyle has caused humans to be genetically predisposed to aggression and killing. Although highly controversial, some argue it may help explain why some humans still gain enjoyment from hunting despite the fact that it is no longer necessary for survival (Washburn & Lancaster, 1968; Wrangham & Peterson, 1996).

More recently, Hart and Sussman (2005) proposed an alternative explanation to the role of hunting in human evolution which has quickly gained widespread acceptance. "Ecologically and psychologically we were, until very recently, prey meat—meals for large frightening animals" (p. 247). With the exception of a relatively brief period in recent human history, we were not *man the hunter*. Instead, we were *man the hunted*. Interestingly, this theory may help explain the seemingly innate human fear of wildlife we see today.

Conversely, the biophilia hypothesis suggests there is a genetic basis for the positive response humans tend to have toward nature (Ulrich,1993). Just as certain natural stimuli can solicit negative or avoidance (i.e. biophobic) responses, others can solicit positive (i.e. biophilic) responses. Various laboratory conditioning experiments support the idea that humans are biologically predisposed to acquire and retain biophobic responses to certain natural stimuli and conditions that potentially presented humans with danger throughout our evolutionary history (e.g. snakes, rats, heights, closed spaces, etc.). If these findings are true, then applying this idea to biophilic responses may not be that far of a stretch.

If biophilia is present in the gene pool, then that would mean a predisposition to respond positively toward certain natural stimuli would have somehow contributed to an individual's fitness and increased their chances for survival (Ulrich, 1993). Most research

on biophilia focuses on landscapes and suggests humans will exhibit a positive response to landscapes containing elements that would have favored survival (i.e. open areas with scattered clusters of trees, water features, etc.). Unlike biophobia, however, very few studies have focused on testing prepared learning theory with respect to biophilic responses. This deficiency is likely due to the fact that positive conditioning studies are more difficult to conduct than negative conditioning studies.

Although the biological tendencies of biophilia are weaker than those of biophobia, there seems little doubt that humans need to affiliate with nature in order to ensure our own well-being. As Kellert (1996) explained, "biological diversity and ecological process are the anvils on which human physical and mental fitness are formed" (p. 27). Simply put, feeling connected with nature has a way of satisfying our emotional, intellectual, and spiritual needs. Unlike biophobic responses, however, biophilic responses do not occur automatically and must be fostered in order to achieve their full expression.

Through increasingly more modern lifestyles, humans are becoming further and further removed from the natural world. In spite of this, the need to feel connected with nature persists (Hinds & Sparks, 2008). As a result, there has been a growing body of research focusing on connection with nature. Connectedness with nature is defined as the extent to which an individual believes he or she is a part of the natural environment (Bruni, Fraser, & Schultz, 2008). Therefore, if an individual possesses schemas of self and nature that highly overlap one another, then that individual would possess a higher connection with nature.

Aldo Leopold (1949) argued that people must first feel connected with nature before they can feel responsible for nature. Building on this notion, many now believe connection to nature may be used as a predicting factor in determining whether a person will engage in pro-environmental behaviors (Mayer et al., 2009). As a result, several scales have been developed as a means to measuring connectedness with nature (e.g. Mayer & McPherson Frantz, 2004; Nisbet, Zelenski, & Murphy, 2009; Perkins, 2010).

Each scale presents its own strengths and weaknesses, with subsequent scales seeking to resolve the shortcomings of those previous. For example, the Inclusion of Self in Nature (INS) scale sought to operationalize the theory of psychological inclusion of nature in one's self concept (Schultz, Shriver, Tabanico, & Khazian, 2004). The INS scale is a single-item measure where participants choose a pair of overlapping circles that best illustrate the level of interconnectedness between *self* and *nature*. Although somewhat useful, the INS scale assumes that participants are able to accurately identify an abstract representation of their relationship with nature.

Mayer and McPherson Frantz (2004) developed the multi-item Connectedness to Nature Scale (CNS) to measure participants' connection to nature acquired through affective and experiential means. Overall, the CNS has been shown to be more accurate than the INS scale. However, it also fails to take into consideration the physical aspect of human-nature relationships. Nisbet et al. (2009) sought to remedy this issue by developing the Nature-Relatedness (NR) scale. By incoporating the affective, cognitive, and physical aspects of human-nature relationships, the NR scale provides a more complete assessment of connection to nature. Yet, some argue that scales such as these

are flawed because they are not actually measuring affective aspects, but cognitive aspects instead (Perrin & Benassi, 2009).

Consequentially, Pennisi (2007) developed a multi-dimensional connection to nature scale by utilizing both qualitative and quantitative methods. The scale focuses on the relationship between connection to nature, identity, and values. The scale recognizes the affective, cognitive, experiential aspects of connection to nature as well. More recently, Perkins (2010) developed the Love and Care for Nature (LCN) scale based on the same principles. However, the scale focuses heavily on the emotional aspect of connection to nature and lacks the depth seen in previously developed scales.

Most studies involving connection to nature suggest that spending time in nature strengthens feelings of connectedness. Many focus on the effects of spending time in parks or zoos (e.g. Schultz & Tabanico, 2007; Bruni et al., 2008; Burbach, Pennisi, West, & Ziegler-Chong, 2012), but partipation in outdoor recreational activities may also strenghen feelings of connection with nature (Nisbet et al., 2009).

Studies involving connection with nature tend to focus on its effect on well-being, rather than attitudes explicitly. Many of these studies have found that feeling connected with nature has a positive effect on an individual's well-being (e.g. Mayer et al., 2009; Savanick Guiney & Oberhauser, 2009; Cervinka, Roderer, & Hefler, 2012; Nisbet, Zelenski, & Murphy, 2011).

When connection to nature studies do incorporate attitudes, they tend to focus on attitudes related to general concern for the environment. Dutcher et al. (2007), for example, surveyed riparian landowners using questions designed to measure connectivity with nature and concern for the environment. Most respondents indicated a high level of

connectivity with nature. When compared with other independent variables (e.g. gender, income, and political views), connectivity with nature was considerably more important in predicting environmental concern. Other studies found similar results (e.g. Bruni & Schultz, 2010; Gosling & Williams, 2010; Kaiser et al., 2011).

If connection to nature fosters a general concern for the environment, then it would be reasonable to assume that it would also foster a concern for wildlife in general. Therefore, someone who feels strongly connected to nature would likely have a positive attitude toward wildlife conservation efforts as well. One of the objectives of this study was to determine participants' attitudes toward a wildlife corridor and compare them with their connection to nature. It was expected that a strong connection to nature will correspond with a positive attitude toward a wildlife corridor. Thus, the following hypothesis was developed.

H4: Connection to nature will be positively correlated with attitude toward a wildlife corridor.

Values

Values are the most fundamental concept within the cognitive hierarchy model of human behavior and have long been the center of human dimensions studies (Fulton, Manfredo, & Lipscomb, 1996). For this study, a value is defined as "a stable, meaning-producing, super-ordinate cognitive structure" (Rohan, 2000, p. 257)[1]. Values are abstract in nature and they do not focus on specific objects or situations (Rokeach, 1973;

[1] This definition should not be confused with the term value being used as a verb, which means to assign goodness or worth.

Schwartz, 1992). They are the most central to the cognitive structure, forming the foundation for basic beliefs.

Understanding the concept of values is important if we wish to gain a better understanding of human behavior. Although values do not influence behavior directly, they provide the building blocks from which attitudes are formed (Rokeach, 1973). In turn, attitudes eventually give rise to behavioral intentions and behaviors. This hierarchical concept explains why a person with a particular value typically expresses that value in their attitudes regarding a wide variety of topics, leading them to behave in a consistent manner relating to those topics as well (de Groot & Steg, 2010).

Values are important elements in cultural transmission, forming through a process where experiences slowly become consolidated over time (Rohan, 2000). Consequently, values are not determined by one person or event, but many. Once established, values are very stable and single events no longer have a significant impact. Therefore, values are unlikely to change unless a person is presented with massive and convincing evidence that severely contradicts their existing position.

Perhaps the most defining characteristic of values, however, is their limited number (Rokeach, 1973; Schwartz, 1992). This is because values are the cognitive representations of the basic needs required for human existence. These needs can be classified into one of three categories: biologically-based needs, socially-based needs, and survival needs for maintaining groups (Schwartz, 1994).

Rokeach (1973) proposed values are organized into a value system. Within this system, there are instrumental values, or those regarding modes of conduct, and terminal values, or those regarding end-states of existence. Falling under the instrumental category

were values focusing on morality. Terminal values included personal and social values. In total, 36 values were identified (18 instrumental and 18 terminal).

According to Rokeach (1973), the value system serves several important functions. First, it provides standards that guide our activities. From social issues to political ideology, values help us evaluate others and rationalize our own actions. Second, it aids in the decision-making and conflict resolution processes. Finally, it allows basic human needs to be fully expressed—paving the way for higher goals that lie beyond our immediate needs.

Schwartz (1992), on the other hand, proposed a typology of 10 value domains. The value domains are arranged in a circle, where conflicting values are opposite from one another and harmonious values are adjacent to one another. Although the value domains found in this typology are universal, this arrangement suggests different people can have different value structures. This is because value types can be prioritized differently.

In addition to the value domains, Schwartz's (1992) typology was also assigned two main motivational dimensions. These motivational dimensions are described as self-enhancement—self-transcendence and openness to change—conservation. The opposing sides of each motivational dimension are positioned across from one another, aligning them with the values with which they are associated. This helps illustrate the relationship between values, attitudes, and behavior.

Environmental values

Early studies regarding environmental values relied heavily on the empirical approach for conducting research. Typically, a sample would be selected from a

population of interest and participants would be asked open-ended questions related to nature and human-nature relationships (King, 1947; Hendee, 1974; Rolston & Coufal, 1991; Manning, Valliere, & Minteer, 1999). Different survey items would represent different themes, where a theme reflected a type of value. Generally, the surveys would be catered to fit a particular topic of interest. As a result, findings would be presented as a value typology for that topic.

As the social sciences began to take notice of the social aspects of humans and nature, an approach where environmental values were explicitly identified was desired. Unfortunately, values identified by Rokeach (and later, Schwartz) were too broad to recognize values regarding the environment explicitly. Kellert (1980) set out to remedy this situation by using interviews to construct a general typology of values toward nature. From his study, he identified nine basic values: 1) utilitarian, 2) ecologistic-scientific, 3) naturalistic, 4) aesthetic, 5) symbolic, 6) dominionistic, 7) humanistic, 8) moralistic, and 9) negativistic.

Although very useful in understanding the various ways in which humans view nature, it is important to remember Kellert's typology was based solely on qualitative findings. This has raised some concerns because it failed to take into consideration the complexity of psychometric scales (Kellert,1980). In addition, his approach lacked a clear theoretical foundation for the concepts being measured and confusion still remains as to whether he was actually measuring values (Vitterso, Berke, & Kaltenborn, 1999).

Despite these shortcomings, Kellert's typology has been repurposed by others to measure attitudes. Bjerke and Kaltenborn (1999), for example, measured attitudes toward large carnivores using six subscales based on the ecological, moralistic, naturalistic,

utilitarian, negativistic, and dominionistic values. Their study suggested that the first three subscales are associated with positive attitudes, while the remaining subscales are associated with negative attitudes.

Mankin, Warner, and Anderson (1999) found similar results when comparing attitudes toward several wildlife-related issues with perceptions of wildlife. Coincidentally, many of these perceptions corresponded with the values described by Kellert. Interestingly, nearly all of the respondents had a positive attitude toward wildlife and most ranked wildlife as being equally important as either pets or humans (humanistic value). Many respondents also indicated they had observed wildlife within the past year (naturalistic/aesthetic value) and were satisfied with the amount and variety of wildlife present (ecologistic-scientific value).

Subsequent studies sought to resolve some of the problems seen in Kellert's typology by examining value orientations, rather than values. Kluckhohn (1951) defined value orientations as "a generalized and organized conception, influencing behavior, or nature, of man's place in it, of man's relation to man, and of the desirable and nondesirable as they may relate to man-environment and interhuman relations" (p. 411). In the case of environmental value orientations, individuals are assigned an orientation according to the guiding principles in their lives that relate to the environment and/or environmental behaviors (de Groot & Steg, 2008).

Some studies narrowed their focus to explore only wildlife value orientations. Inspired by the wildlife value categories described by King (1947), Purdy and Decker (1989) developed the Wildlife Attitude and Values Scale (WAVS). Using factor analysis, they identified three WAVS categories: 1) Social Benefits; 2) Traditional Conservation;

and 3) Problem Tolerance. A fourth WAVS category, Communication Benefits, was added later (Butler, Shanahan, & Decker, 2003).

Similarly, Fulton et al. (1996) developed a theoretical approach to studying wildlife values. They used a domain sampling approach to develop measurement scales for eight wildlife belief dimensions they had previously identified. Data collected from a series of pretests were used to assess the internal consistency of the measurement scales, allowing them to be refined. The result was a list of survey questions that could be used to measure each wildlife belief dimension. Eventually, the wildlife belief dimensions evolved into wildlife value orientations where participants could be categorized into one of four classes: Traditionalist, mutualist, pluralist, and distanced (Manfredo, 2008).

Where wildlife values are concerned, the scales developed by Purdy and Decker (1989) and Fulton et al. (1996) are quite useful. However, where they may be successfully applied is limited to situations that involve hunting and fishing because the foundations from which they based their scales focused heavily on wildlife use.

In contrast, others opted for a broader environmental focus. Gagnon Thompson and Barton (1994), for example, suggested that anthropocentrism was only one of three environmental value orientations. The first two environmental value orientations are associated with positive attitudes toward protecting the environment. However, the underlying motives are quite different. Anthropocentrism focuses on environmental protection in terms of human benefits. The second environmental value orientation, ecocentrism, supports environmental protection because nature holds spiritual and intrinsic value. The third environmental value orientation is apathy and it reflects a general lack of interest in environmental issues.

More recently, de Groot and Steg (2008) developed an environmental value orientation scale based on a short version of Schwartz's value theory created by Stern, Dietz, Abel, Guagnano, and Kalof (1999). Since environmental values are best reflected in self-transcendence versus self-enhancement in Schwartz's value theory, the selection of value items was limited to this dimension. The value items reflect one of three environmental value orientations: egoistic, altruistic, and biospheric. Recent research demonstrated egoistic, altruistic, and biospheric value orientations as distinct constructs (e.g. de Groot, Steg, Keizer, Farsang, & Watt, 2012).

These environmental values are also associated with positive attitudes toward protecting the environment, but for very different reasons (de Groot & Steg, 2010). Both the egoistic and altruistic valuens focus on human interests. However, the egoistic value is geared toward self-interest, while the altruistic value is geared toward the welfare of other people. The biospheric value, on the other hand, is similar to ecocentrism in that it focuses on protecting the environment simply for its intrinsic value.

While these studies suggest that positive attitudes toward the environment are associated with certain environmental values, it is assumed that environmental values do not directly influence attitude toward a wildlife corridor. Values merely provide the foundation from which basic beliefs are formed, eventually giving rise to higher order attitudes. Therefore, it stands to reason that environmental values influence attitudes indirectly as well by moderating the relationship between attitude toward a wildlife corridor and connection to nature. Thus, the following hypotheses were developed.

H5: Altruistic and biospheric environmental values will be positively correlated with attitude toward a wildlife corridor.

H6: Altruistic and biospheric environmental values will strengthen the relationship between attitude toward a wildlife corridor and connection to nature.

Social and Personal Norms

In the early twentieth century, social norms emerged as a central concept of anthropological and sociological theories. They were often used as a descriptive device for characterizing cross-cultural differences in behavioral patterns (Hector & Opp, 2001). Interest in social norms slowed during the mid to late 1900s (Horne, 2001). However, interest in the concept was renewed in the 1990s when it was discovered that social norms could be applied to other disciplines such as economics and political science. Today, no concept is invoked by social scientists more often than the social norm. Social norms help explain the power a social group has over the actions of individuals.

Social norms are the rules that direct the behavior of individuals within a social group (Thogersen, 2006). They are often referred to as *ought* statements, specifying what actions are considered acceptable or unacceptable. These rules are enforced, formally or informally, through the belief that sanctions will be forthcoming for those who do not abide by them (Blake & Davis, 1964). These sanctions can be external or internal, verbal or non-verbal, and physical or non-physical.

The effectiveness of a social norm may also depend on the social group (Coleman, 1990). An individual may have their own beliefs about what is acceptable behavior. However, these beliefs are not social norms unless they are shared by others within the social group. This means that social norms have the ability to regulate the behavior of individuals, but only if they perceive themselves as being part of the social group and recognize what others expect of them. Interestingly, an individual may be

influenced by the expectations of others even when these expectations do not exist (Thogersen, 2009). In some cases, only the perception that a social norm exists is all that is needed to influence an individual's behavior.

Social norms are conditional (Fine, 2001). In other words, social norms may apply in some social situations but not in others. For example, a social norm may apply when an individual is at home, but that same social norm may no longer apply when that individual is traveling as a tourist. Social norms are also ambiguous, meaning it may be difficult to determine what is acceptable in a given situation. For example, an action may be considered unacceptable in most situations. However, that same action may become more acceptable in an emergency.

Social norms are generally described as being subjective or perceived, which means they are based on group expectations and any associated sanctions are externally defined and imposed (Thogersen, 2006). Social norms are sometimes broken down into two categories: descriptive and injunctive (Cialdini, Reno, & Kallgren, 1990). Descriptive norms describe what is normal or typical. They are observable behavior patterns that provide an individual with clues about what is considered acceptable in a given situation. Essentially, a descriptive norm will suggest to an individual that if everyone else is doing something, they should do it as well.

Injunctive norms, on the other hand, more closely resemble the traditional concept of what social scientists refer to as social norms (Cialdini et al., 1990). Injunctive norms are defined as perceptions an individual has about how others expect him or her to behave in certain situations. Rather than simply suggesting what is considered acceptable and unacceptable behavior, injunctive norms encourage conformity through the threat of

sanctions. Since what is considered acceptable is also what is typically done, injunctive and descriptive norms are often confused with one another.

Injunctive norms are capable of producing desirable behavior in individuals, which can ultimately benefit society as a whole (Cialdini et al., 1990). In recent years, social norms have emerged as an effective alternative to traditional information-only campaigns intended to promote pro-environmental behaviors (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). As a result, recent years have seen a surge in programs that utilize normative messages as a primary tool in modifying behaviors.

A majority of normative message-related studies tend to focus on anti-littering, recycling, and water conservation programs. Early studies revolved around the use of modeling to help establish pro-environmental social norms (Schultz, Oskamp, & Mainieri, 1995). Modeling, or the so-called block leader approach, is when a respected community leader agrees to serve as a model for other members of the community. For example, Nielsen and Ellington (1983) found a significantly higher weekly curbside recycling participation rate when a community leader acted as a model. Burn (1991) found similar results.

In a similar branch, Costanzo, Archer, Aronson, and Pettigrew (1986) suggested that individuals will adopt energy conservation behavior after its effectiveness has been demonstrated through the experiences of friends or acquaintances. This concept, known as social diffusion, involves two influence processes. The first process relies on the information being communicated through interpersonal contact. Since friends and acquaintances are perceived as more trustworthy sources than the media, information received through interpersonal channels has a greater potential to influence behavior.

The second process relies on the modeling of effective behavior (Costanzo et al., 1986). Modeling has the greatest potential to influence the behavior of others when a respected individual engages in a behavior that produces some form of payoff. In the case of social diffusion, the respected individuals are often friends and acquaintances, making the benefits of the modeled behavior more evident.

Eventually, normative message studies began distinguishing between descriptive and injunctive norms. By focusing on littering in public places, Cialdini et al. (1990) attempted to examine the effects of descriptive and injunctive norms on individual behavior. They observed visitors to a university-affiliated hospital who were returning to their vehicles in a parking garage to find flyers placed under their windshield wipers. For the descriptive norm, the researchers created a littered environment on one level and a clean environment on another level. For the injunctive norm, a model was instructed to either discard a flyer on the ground or simply walk by as visitors entered the garage.

According to the Cialdini et al. (1990) study, individuals in the littered environment tended to litter more than individuals in the clean environment. More interesting, however, is the evidence of a relationship between descriptive and injunctive norms. When the model littered in a littered environment, 54% of those observed also littered. However, when the model littered in a clean environment, only 6% of those observed also littered. This suggests that the power of social norms to influence behavior is strengthened when descriptive and injunctive norms correspond with one another. Later studies found similar results (Heywood & Murdock, 2002; Schultz et al., 2007).

Goldstein, Cialdini, and Griskevicius (2008) focused on normative messages as well. However, their study explored the relationship between normative messages and

social identities. Descriptive normative messages designed to appeal to different social identities were printed on hangers providing information about reusing hotel towels to help conserve water. Interestingly, same room identity yielded the highest participation rate, followed by guest identity and citizen identity.

Unlike social norms, personal norms are not influenced by social pressures. According to Schwartz (1977), a personal norm can be described as a self-expectation of specific action in a specific situation. In other words, personal norms are defined by feelings of moral obligation and individuals comply with these norms because they believe that doing so is the right thing to do (Thogersen, 2006). The threat of sanctions may still exist, but they are self-administered (e.g. feelings of guilt, loss of self-esteem, etc.).

Some believe that personal norms have a greater ability to influence pro-environmental behaviors than social norms, but only when awareness of consequences is high. Schwartz (1977) defined awareness of consequences as awareness of the consequences of one's actions and how those consequences may affect others. However, Bratt (1999) challenged this definition. Where pro-environmental behavior is concerned, the term awareness can be somewhat ambiguous. Therefore, he argued that assumed consequences was more appropriate because individuals are more likely to have assumptions rather than an awareness of facts.

Nevertheless, Hopper and McCarl Nielsen (1991) confirmed the relationship between personal norms and awareness of consequences. In their study, they used a block-leader (i.e. modeling) recycling program to explore recycling as an altruistic behavior. According to their results, personal norms directly influenced recycling

behaviors when awareness of consequences is high. Social norms influence recycling behaviors as well. However, a model where social norms indirectly influence behavior through personal norms provided the best fit. Others found similar results (Bratt, 1999; Harland, Staats, & Wilke, 1999; Corral-Verdugo & Frías-Armenta, 2006; Thogersen, 2006; Thogersen, 2009; Onwezen, Antonides, & Bartels, 2013).

Social or personal norms are commonly used in conservation-related studies. Typically, these studies revolve around a conservation-oriented public policy or program currently in place and include participant attitudes toward the policy or program. Olive and Raymond (2010), for example, examined the norms and attitudes of private landowners regarding endangered species conservation under the Endangered Species Act. A majority of respondents had a positive attitude toward protecting endangered species on their property. Interestingly, a majority of respondents also identified with the normative belief that they have an intrinsic duty to take care of the land. Other studies found similar results (Johansson & Henningsson, 2011; Moon et al., 2012).

In addition, some studies have explored the indirect relationship between values and personal norms. Stern et al. (1999) developed a Value-Belief-Norm theory, which draws an indirect link between values and personal norms. According to the study, environmental values (especially altruistic values) influence the New Ecological Paradigm (originally developed by Dunlap & Van Liere, 1978). In turn, the New Ecological Paradigm influences awareness of consequences and pro-environmental personal norms. De Groot et al. (2012) found similar results. However, biospheric values were shown to have the most influence on personal norms.

If a norm, social or personal, encourages conservation-related behaviors, then it is reasonable to assume that it would also give rise to a favorable attitude regarding a wildlife corridor. However, as mentioned above, these two variables likely share a casual link. Therefore, social and personal norms may indirectly influence the relationship between attitudes and connection to nature as well. Thus, the following hypotheses were developed.

H7: Social and personal norms encouraging pro-environmental behaviors will be positively correlated with attitude toward a wildlife corridor.

H8: Social and personal norms encouraging pro-environmental behaviors will strengthen the relationship between attitude toward a wildlife corridor and connection to nature.

CHAPTER 3

Methods

Study Area

Currently in the planning process, the Prairie Corridor on Haines Branch will connect two existing tall-grass prairie remnants in Lancaster County, Nebraska: Pioneers Park Nature Center and Spring Creek Prairie. Located just west of Lincoln, Pioneers Park Nature Center is a city-owned nature preserve encompassing a total of 668 acres (including over 500 acres of tall-grass prairie). Approximately 10 miles to the southwest (near the town of Denton) is Spring Creek Prairie, an 808-acre tall-grass prairie preserve owned by the Audubon Society (see Figure 1).

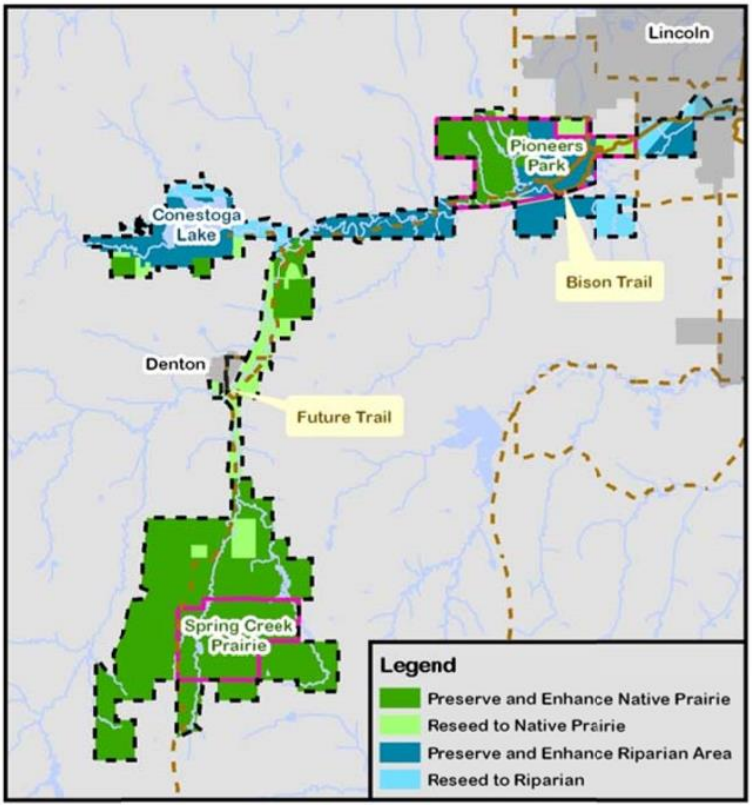

Figure 1. Map of the proposed Prairie Corridor on Haines Branch. Pioneers Park Nature Center and Spring Creek Prairie are outlined in pink (Salt Valley Greenway and Prairie Corridor, 2012).

Participants

For this study, participants were from one of two groups – park visitors and residents. Each of these groups consist of two subgroups. Visitors from Pioneers Park Nature Center and Spring Creek Prairie make up the park visitors group. Urban and rural residents living near an existing wildlife corridor make up the residents group.

Recruitment methods were selected based on the ease of accessibility for each of the groups. Pioneers Park Nature Center and Spring Creek Prairie are both open to the public. Therefore, participants were recruited by approaching them in person while they were participating in non-consumptive activities (e.g. hiking, photography, viewing wildlife or exhibits, etc.) at one of the parks. In order to gain the largest sample size possible, recruitment took place at times when visitor traffic is known to be high (e.g. weekends, special events, etc.).

Residents, on the other hand, were contacted by mail using a modified Dillman approach (Dillman, Smyth, & Christian, 2008) (see Appendix A: Post Cards). Wilderness Park is an existing wildlife corridor on the western edge of the City of Lincoln, approximately 3 miles east of Pioneers Park Nature Center. Residents living near the corridor were identified using ArcGIS and county assessor data.

To maximize response rates, 850 addresses of homeowners were randomly selected from a 0.5 mile buffer area on the east side of Wilderness Park, which is located within the city limits. Since rural residents are more widely dispersed, all of the 550 homeowner addresses from a 1.5 mile buffer area on the west side of Wilderness Park, which is located outside the city limits, were selected to receive surveys (see Figure 2). These two groups are referred to as urban and rural residents, respectively. However, it is

important to note that many of the so-called rural residents actually live in satellite acreage developments (i.e. they do not own agricultural land).

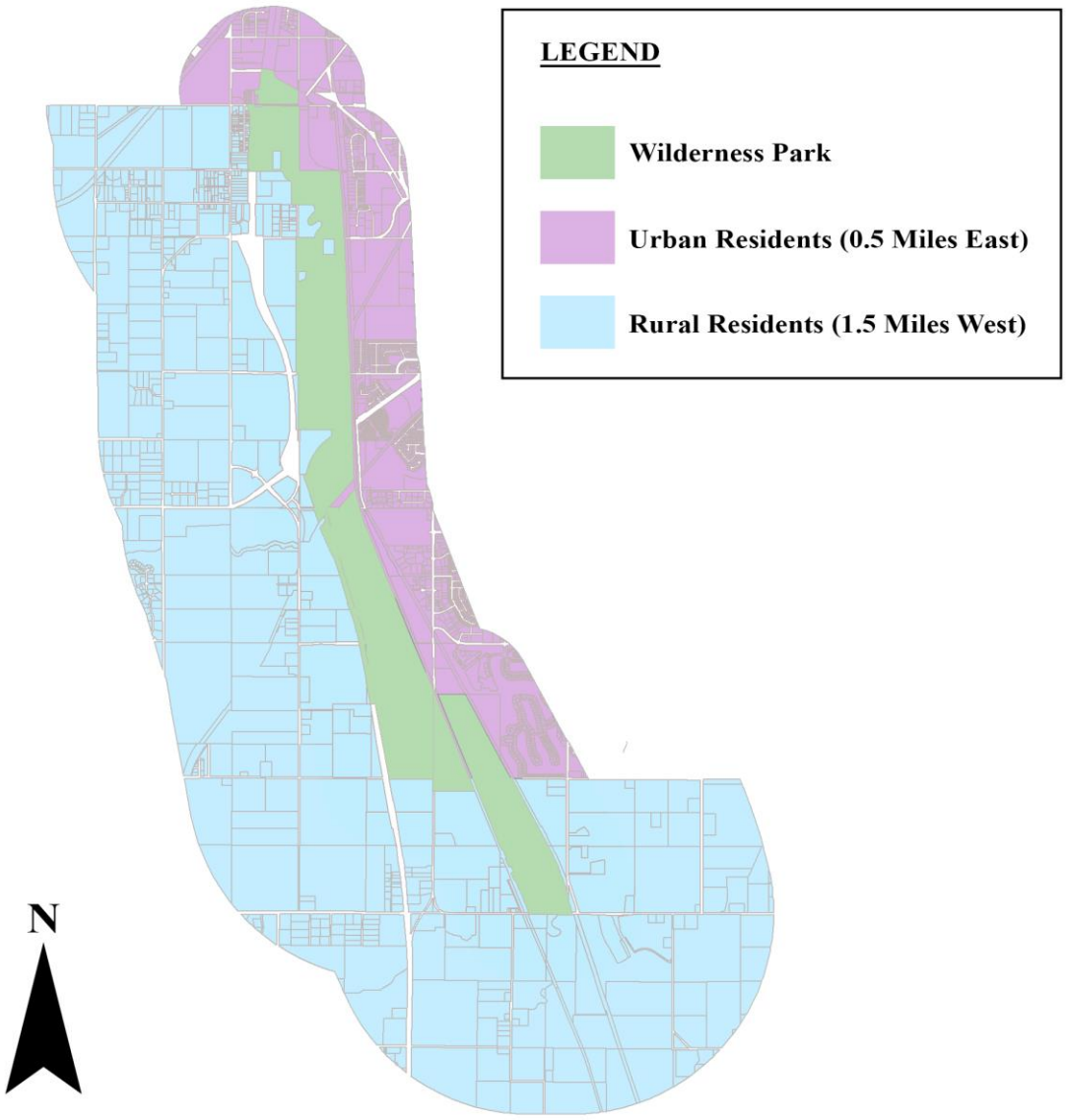

Figure 2. Area surrounding Wilderness Park selected for acquiring mailing lists for urban and rural residents.

Survey Design

The same survey was used for both park visitors and residents. It was constructed using scales developed by previous studies for connection to nature (Pennisi, 2007), norms (Weir, 2012) and environmental value orientations (de Groot & Steg, 2008). These scales were chosen because they were shown to be reliable and were most closely aligned with the objectives of this study. However, the normative items needed to be modified slightly so the scale would more closely match the topic of the study. In addition, environmental value orientations were not assigned to each participant. Instead, all three orientations were analyzed independently. Egoistic, altruistic and biospheric values have been clearly distinguished empirically (e.g. de Groot, Steg, Keizer, Farsang, & Watt, 2012). Therefore, they are referred to below as environmental values rather than environmental value orientations.

No scales for attitude toward a wildlife corridor were available. Therefore, the attitude statements for this study were modeled after the goals outlined in the Salt Valley Greenway and Prairie Corridor report prepared by the City of Lincoln, Parks and Recreation Department. These goals include habitat expansion, recreation, education, and benefits for the community and local economy (Salt Valley Greenway and Prairie Corridor, 2012) (see Appendix B: Sample Survey).

Analyses

Prior to analysis, SPSS Statistics software was used to test the reliability of each survey item. This allowed any inconsistencies among answers to the questions within each scale and/or subscale to be identified. Independent samples *t*-tests were then conducted to test Hypotheses 1 through 3.

SPSS Statistics software was used to perform Pearson product-moment correlation and multiple regression analyses. Pearson product-moment correlation was used to test Hypotheses 4, 5 and 7. In addition, multiple regression analysis was used to determine the overall fit (i.e. variance explained) of the models (Kohler & Kreuter, 2009). Multiple regression analysis is useful because it allows more than one independent variable to be examined at the same time to see which variables help explain a larger portion of the variation. Therefore, multiple regression analysis was chosen for this study to test whether and to what extent connection to nature, environmental values and/or norms predicted attitude toward a wildlife corridor.

Since structural equation modeling analyzes all variables in the model simultaneously, it can be used to explore relationships between all of the variables (i.e. not simply independent vs. dependent) and identify variables acting as second order factors (i.e. moderators) (Dell Software, 2015). Therefore, structural equation modeling was also used to test Hypotheses 6 and 8.

CHAPTER 4

Results

One hundred fifty-two park visitors completed the survey from in person invitations – 77 at Pioneers Park Nature Center and 75 at Spring Creek Prairie. Participants ranged in age from 18 to 77 years old, with participants occurring most frequently in the 30 to 39 and 60 to 69 age groups at Pioneers Park Nature Center and Spring Creek Prairie respectively. Most participants, approximately 68% at Pioneers Park Nature Center and 63% at Spring Creek Prairie, were female and most participants, approximately 90% at Pioneers Park Nature Center and 95% at Spring Creek Prairie, had attended at least some college.

For the by-mail surveys, a total of 850 surveys were sent to urban residents and 156 (approximately 18%) were returned. Another 550 surveys were sent to rural residents and 116 (approximately 21%) were returned. Participants ranged in age from 23 to 92, with participants occurring most frequently in the 60 to 69 and 50 to 59 age groups in the urban and rural populations respectively. Approximately 52% of urban residents and 46% of rural residents were female. Most participants, approximately 88% of urban residents and 95% of rural residents, had attended at least some college.

Reliability tests showed all except one question on the survey to be reliable. Question 10 from the environmental values section (i.e. *having an impact on people and events*) was inconsistent with the other questions corresponding with egoistic values, resulting in a Cronbach's Alpha of 0.64. Nunnally and Bernstein (1994) concluded that acceptable minimum reliability (Cronbach's Alpha) for measurement scales should be 0.70. When excluded, the Cronbach's Alpha was raised to a more acceptable level (0.71)

(Table 1). Therefore, it was decided to exclude this question from further data analysis. The overall Cronbach's Alpha of the survey items was 0.91.

An independent samples *t*-test confirmed there was a significant difference in park visitors' (M = 4.62, SD = 0.47) and residents' (M = 4.0, SD = 0.90) attitudes toward wildlife corridors; $t(422) = 7.91$, $p = .000$, $d = 0.87$ (Table 2). Hypothesis 1 was accepted. However, an independent samples *t*-test revealed there was not a significant difference between Spring Creek Prairie visitors (M = 4.67, SD = 0.48) and Pioneers Park Nature Center visitors (M = 4.57, SD = 0.46); $t(150)=1.31$, $p = 0.192$, $d = 0.21$. Similarly, there was not a significant difference between rural residents (M = 3.92, SD = 0.96) and urban residents (M = 4.06, SD = 0.86) residents; $t(270) = 1.26$, $p = 0.208$, $d = 0.15$. Hypothesis 2 and 3 were both rejected.

A Pearson product-moment correlation coefficient showed that connection to nature and attitude toward a wildlife corridor were significantly correlated, $r = 0.19$, $p \leq 0.01$ (Table 1). Hypothesis 4 was accepted.

Pearson product-moment correlation coefficients showed that altruistic environmental values and biospheric environmental values were significantly correlated with attitude toward a wildlife corridor, $r = 0.44$, $p \leq 0.01$; $r = 0.57$, $p \leq 0.01$, respectively (Table 1). Hypothesis 5 was accepted.

Pearson product-moment correlation coefficients showed that social norms and personal norms were significantly correlated with attitude toward a wildlife corridor, $r = 0.39$, $p \leq 0.01$; $r = 0.57$, $p \leq 0.01$, respectively (Table 1). Hypothesis 7 was accepted.

Table 1

Descriptive Statistics and Correlation Matrix for Wildlife Corridor Attitude and Predictor Variables.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Wildlife Corridor Attitude	4.22	0.83	(.93)														
2. Connection to Nature	3.83	0.72	.18**	(.92)													
3. Awe	4.44	0.62	.12*	.77**	(.83)												
4. Identity	3.58	0.93	.15**	.89**	.63**	(.91)											
5. Restoration	3.92	0.75	.17**	.85**	.67**	.73**	(.88)										
6. Sorrow	3.95	0.89	.18**	.74**	.54**	.58**	.48**	(.87)									
7. Spirituality	3.30	1.18	.11*	.82**	.47**	.67**	.59**	.49**	(.83)								
8. Personal Norm	3.75	0.93	.57**	.21**	.15**	.17**	.15**	.22**	.16**	(.87)							
9. Descriptive Norm	3.25	0.71	.44**	.09	.03	.09	.09	.09	.06	.67**	(.72)						
10. Social Norm	2.97	0.88	.39**	.11*	.02	.16**	.07	.06	.08	.62**	.75**	(.81)					
11. Egoistic Values	2.02	1.56	.00	-.07	-.03	-.06	-.02	-.05	-.07	.01	.12*	.12*	(.71)				
12. Altruistic Values	5.43	1.24	.44**	.10*	.08	.06	.08	.14**	.05	.45**	.34**	.29**	.06	(.76)			
13. Biospheric Values	5.42	1.40	.57**	.21**	.12*	.18**	.16**	.21**	.16**	.66**	.48**	.48**	.10*	.66**	(.90)		
14. Age	55.28	14.92	.03	-.07	-.11*	-.02	-.06	-.04	-.09	.01	.03	.05	-.03	.06	.06		
15. Education	4.84	1.60	.10*	.03	.03	.02	.01	.03	.05	.10*	.08	.08	-.04	-.03	-.04	-.07	
16. Gender	1.44	0.50	-.17**	-.05	-.06	-.05	-.03	-.03	-.04	-.18**	-.11*	-.07	.01	-.17**	-.13**	.03	.04

Note. Reliability coefficient estimates (α) are in Parenthesis along diagonals. *p ≤ .05; **p ≤ .01. (Two-tailed tests). Statistical power of .80 achieved for all correlations greater than .10 (two-tailed test; p<.05). *N*'s range from 399 to 424 due to occasional missing data.

Table 2:

*Independent Samples t-Test Results for Differences between Attitudes toward a Wildlife Corridor, *p ≤ 0.001*

	M	SD	SEM	t	df	Sig.
All Park Visitors	4.62	.47	.038	7.91	422	.000*
All Residents	4.00	.90	.055			
Pioneers Park Nature Center Visitors	4.57	.46	.052	1.31	150	.192
Spring Creek Prairie Visitors	4.67	.48	.054			
Urban Residents	4.06	.86	.069	1.26	270	.208
Rural Residents	3.92	.96	.089			

Overall fit of the model of attitude toward a wildlife corridor

Multiple regression analysis was used to determine the overall fit (variance explained) of the model and the relative contribution of each of the predictors (i.e. connection to nature, environmental values, and norms) to the total variance explaining attitude toward a wildlife corridor in different subsets of the study population.

Multiple regression analysis was used to test if connection to nature, egoistic environmental values, altruistic environmental values, biospheric environmental values, personal norms, descriptive norms, social norms, age, gender, and education level significantly predict attitude toward a wildlife corridor for all participants. The results of the analysis indicated the ten variables explained 41.4% of the variance ($F(10, 379) = 26.82$, $p \leq 0.01$). It was found that personal norms significantly predicted attitude toward a wildlife corridor (ß = .28, $p \leq 0.01$), as did biospheric environmental values (ß = .28, $p \leq 0.01$) (Figure 3, Table 3).

Multiple regression analysis was used to test if any of the variables significantly predict attitude toward a wildlife corridor for all park visitors. The results of the analysis

indicated the ten variables explained 33.0% of the variance ($F(10, 121) = 5.95$, $p \leq 0.01$). It was found that personal norms significantly predicted attitude toward a wildlife corridor (ß = .28, $p \leq 0.05$) (Figure 4, Table 4).

Multiple regression analysis was used to test if any of the variables significantly predict attitude toward a wildlife corridor for all residents. The results of the analysis indicated the ten variables explained 38.8% of the variance ($F(10, 242) = 15.37$, $p \leq 0.01$). It was found that personal norms significantly predicted attitude toward a wildlife corridor (ß = .25, $p \leq 0.05$), as did biospheric environmental values (ß = .28, $p \leq 0.01$) and age (ß = -0.12, $p \leq 0.05$) (Figure 5, Table 5).

Multiple regression analysis was used to test if any of the variables significantly predict attitude toward a wildlife corridor for Pioneers Park Nature Center visitors. The results of the analysis indicated the ten variables explained 35.4% of the variance ($F(10, 57) = 3.12$, $p \leq 0.05$). It was found that none of the variables significantly predicted attitude toward a wildlife corridor (Figure 6, Table 6).

Multiple regression analysis was used to test if any of the variables significantly predict attitude toward a wildlife corridor for Spring Creek Prairie visitors. The results of the analysis indicated the ten variables explained 47.2% of the variance ($F(10, 56) = 5.00$, $p \leq 0.01$). It was found that personal norms significantly predicted attitude toward a wildlife corridor (ß = .35, $p \leq 0.05$) (Figure 7, Table 7).

Multiple regression analysis was used to test if any of the variables significantly predict attitude toward a wildlife corridor for urban residents. The results of the analysis indicated the ten variables explained 42.8% of the variance ($F(10, 136) = 10.17$, $p \leq 0.01$). It was found that biospheric environmental values significantly predicted attitude

toward a wildlife corridor (ß = .38, $p \leq 0.01$), as did education level (ß = .15, $p \leq 0.05$) (Figure 8, Table 8).

Multiple regression analysis was used to test if any of the variables significantly predict attitude toward a wildlife corridor for urban residents. The results of the analysis indicated the ten variables explained 41.4% of the variance ($F(10, 98) = 6.92$, $p \leq 0.01$). It was found that altruistic environmental values significantly predicted attitude toward a wildlife corridor (ß = .23, $p \leq 0.05$), as did biospheric environmental values (ß = .28, $p \leq 0.05$) (Figure 9, Table 9).

Since connection to nature alone did not significantly predict attitudes toward a wildlife corridor, structural equation modeling could not be used to test norms and environmental values as moderating factors. Hypotheses 6 and 8 were both rejected.

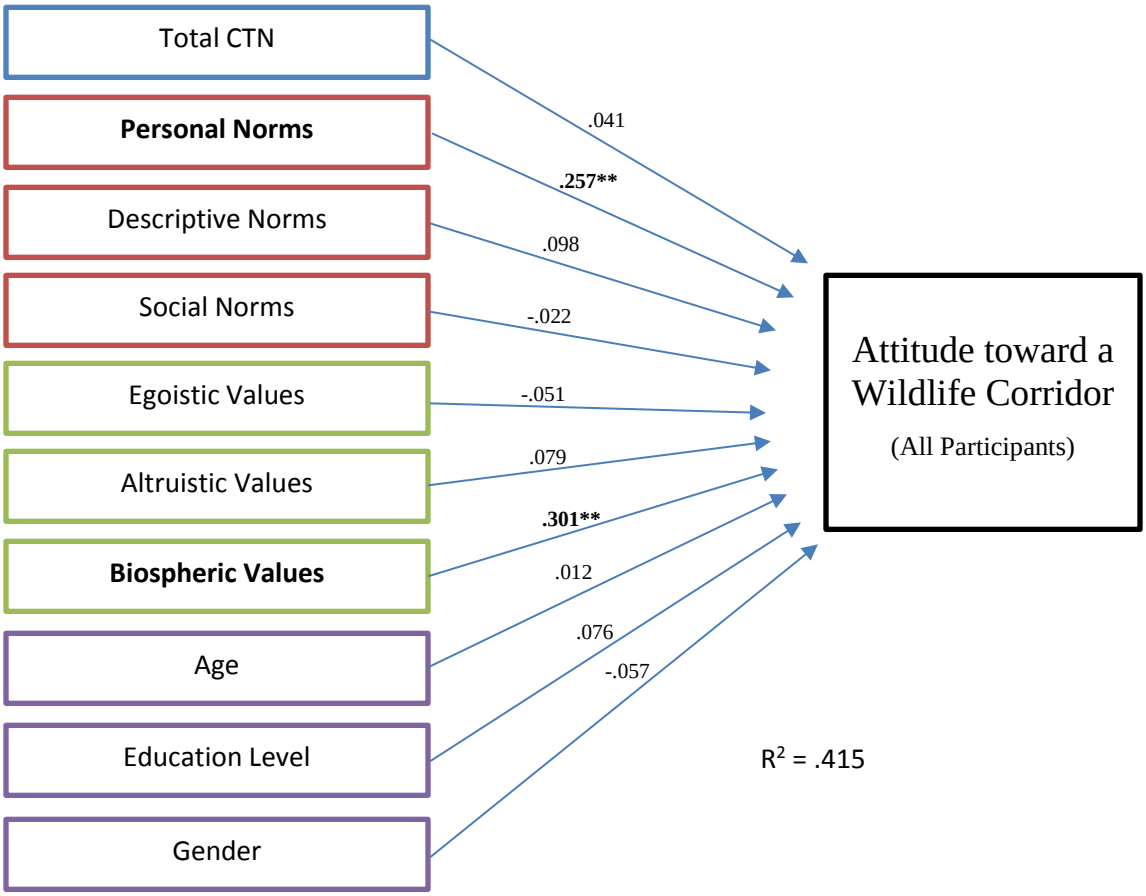

Figure 3. Model showing the relationship between connection to nature, norms, environmental values, and demographic measures and attitude toward a wildlife corridor among all participants. Beta values are listed. *p ≤ .05; **p ≤ .01. (Two-tailed tests).

Table 3.

Multiple regression Analysis Results for All Participants

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.597	.294		5.436	.000		
	CTN	.046	.046	.041	1.009	.314	.931	1.074
	Per Norms	.229	.057	.257	3.980	.000	.371	2.697
	Des Norms	.116	.076	.098	1.522	.129	.370	2.705
	Soc Norms	-.021	.059	-.022	-.357	.722	.407	2.459
	Ego Values	-.027	.021	-.051	-1.278	.202	.957	1.045
	Alt Values	.053	.036	.079	1.470	.142	.539	1.854
	Bio Values	.179	.038	.301	4.706	.000	.378	2.648
	Age	9.742E-05	.000	.012	.292	.770	.980	1.020
	Ed	.043	.023	.076	1.889	.060	.960	1.042
	Gender	-.095	.068	-.057	-1.401	.162	.948	1.054

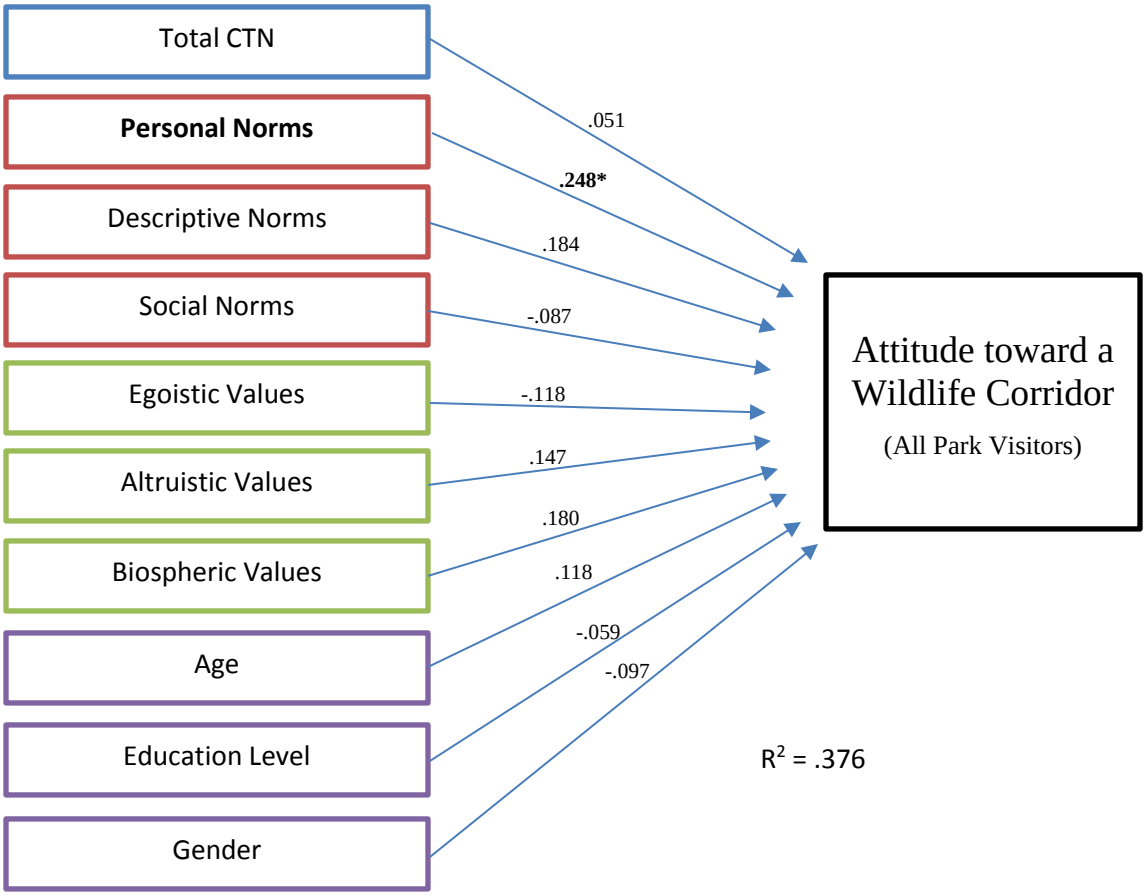

Figure 4. Model showing the relationship between connection to nature, norms, environmental values, and demographic measures and attitude toward a wildlife corridor among all park visitors. Beta values are listed. *p ≤ .05; **p ≤ .01. (Two-tailed tests).

Table 4.

Multiple regression Analysis Results for All Park Visitors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.788	.341		8.169	.000		
	CTN	.039	.072	.051	.547	.586	.581	1.720
	Per Norms	.164	.068	.248	2.414	.017	.472	2.117
	Des Norms	.133	.073	.184	1.815	.072	.484	2.066
	Soc Norms	-.046	.056	-.087	-.823	.412	.447	2.236
	Ego Values	-.037	.023	-.118	-1.589	.115	.912	1.097
	Alt Values	.063	.039	.147	1.604	.111	.594	1.684
	Bio Values	.078	.050	.180	1.548	.124	.368	2.716
	Age	.003	.002	.118	1.523	.130	.836	1.196
	Ed	-.019	.024	-.059	-.789	.432	.906	1.104
	Gender	-.099	.075	-.097	-1.315	.191	.909	1.100

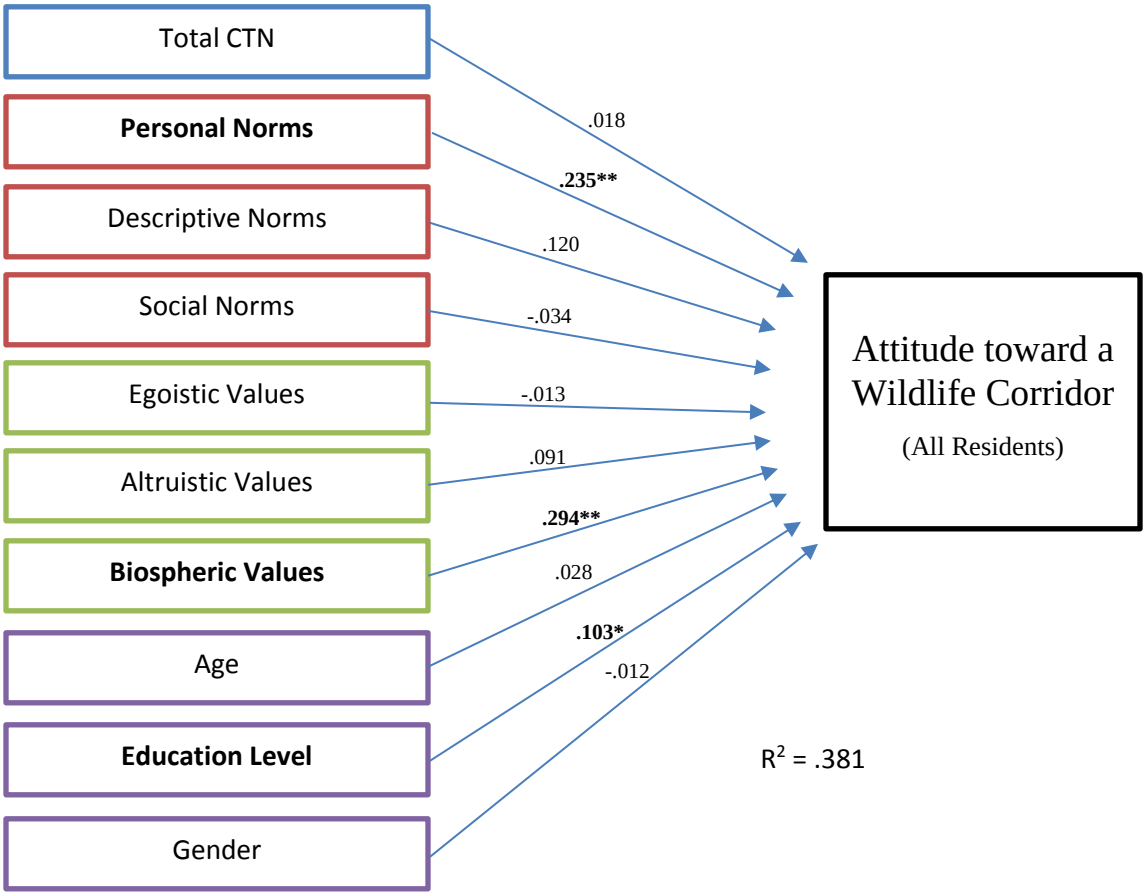

Figure 5. Model showing the relationship between connection to nature, norms, environmental values, and demographic measures and attitude toward a wildlife corridor among all residents living near an existing wildlife corridor. Beta values are listed. *p ≤ .05; **p ≤ .01. (Two-tailed tests).

Table 5.

Multiple regression Analysis Results for All Residents

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.255	.404		3.107	.002		
	CTN	.022	.063	.018	.356	.722	.986	1.014
	Per Norms	.215	.081	.235	2.654	.008	.325	3.081
	Des Norms	.150	.115	.120	1.297	.196	.298	3.354
	Soc Norms	-.036	.088	-.034	-.409	.683	.376	2.662
	Ego Values	-.008	.030	-.013	-.256	.798	.937	1.068
	Alt Values	.064	.050	.091	1.287	.199	.514	1.947
	Bio Values	.180	.050	.294	3.588	.000	.379	2.636
	Age	.000	.000	.028	.545	.586	.972	1.029
	Ed	.062	.032	.103	1.974	.050	.936	1.068
	Gender	-.022	.094	-.012	-.231	.818	.937	1.067

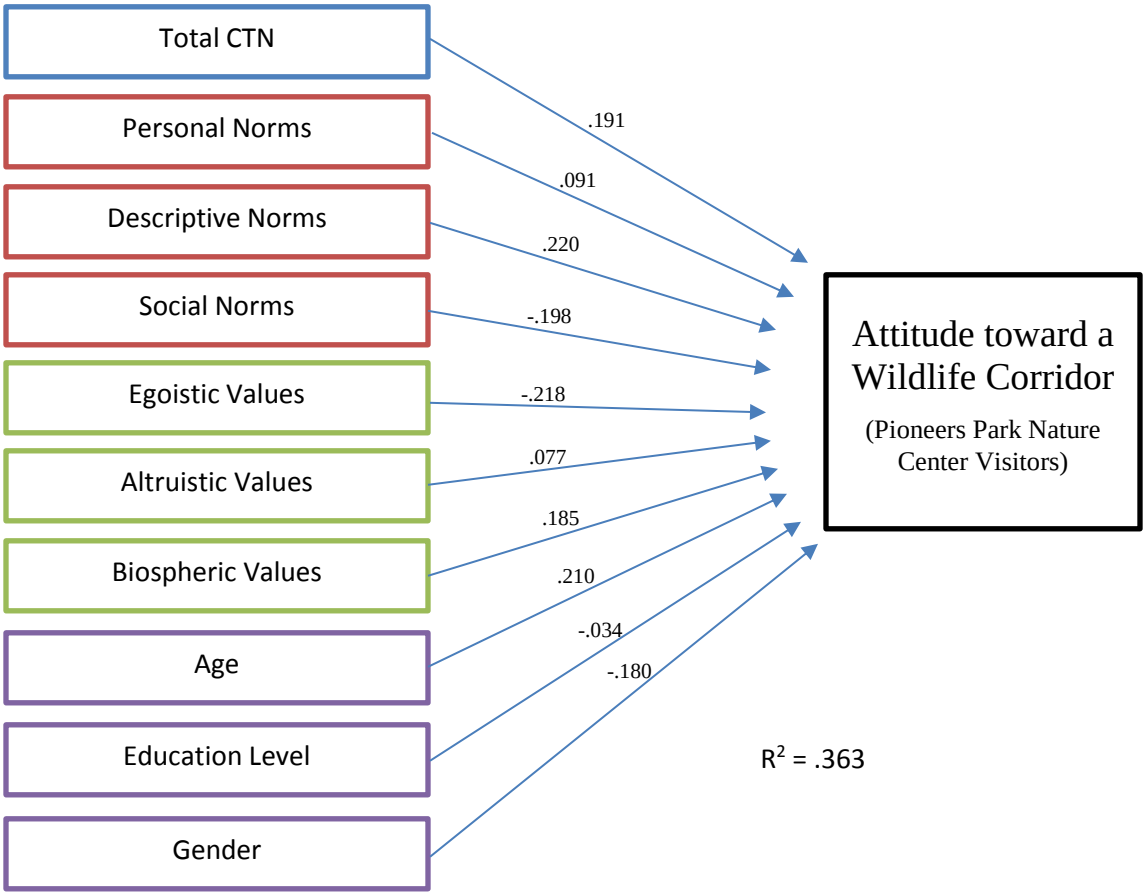

Figure 6. Model showing the relationship between connection to nature, norms, environmental values, and demographic measures and attitude toward a wildlife corridor among Pioneers Park Nature Center visitors. Beta values are listed. *p ≤ .05; **p ≤ .01. (Two-tailed tests).

Table 6.

Multiple regression Analysis Results for Pioneers Park Nature Center Visitors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.031	.551		5.506	.000		
	CTN	.142	.102	.191	1.394	.169	.599	1.671
	Per Norms	.067	.107	.091	.623	.536	.524	1.909
	Des Norms	.156	.108	.220	1.449	.153	.485	2.063
	Soc Norms	-.113	.088	-.198	-1.280	.206	.467	2.142
	Ego Values	-.063	.032	-.218	-1.950	.056	.892	1.121
	Alt Values	.035	.068	.077	.513	.610	.494	2.023
	Bio Values	.077	.073	.185	1.064	.292	.370	2.701
	Age	.007	.004	.210	1.773	.082	.795	1.258
	Ed	-.012	.038	-.034	-.308	.760	.931	1.074
	Gender	-.180	.110	-.180	-1.634	.108	.926	1.080

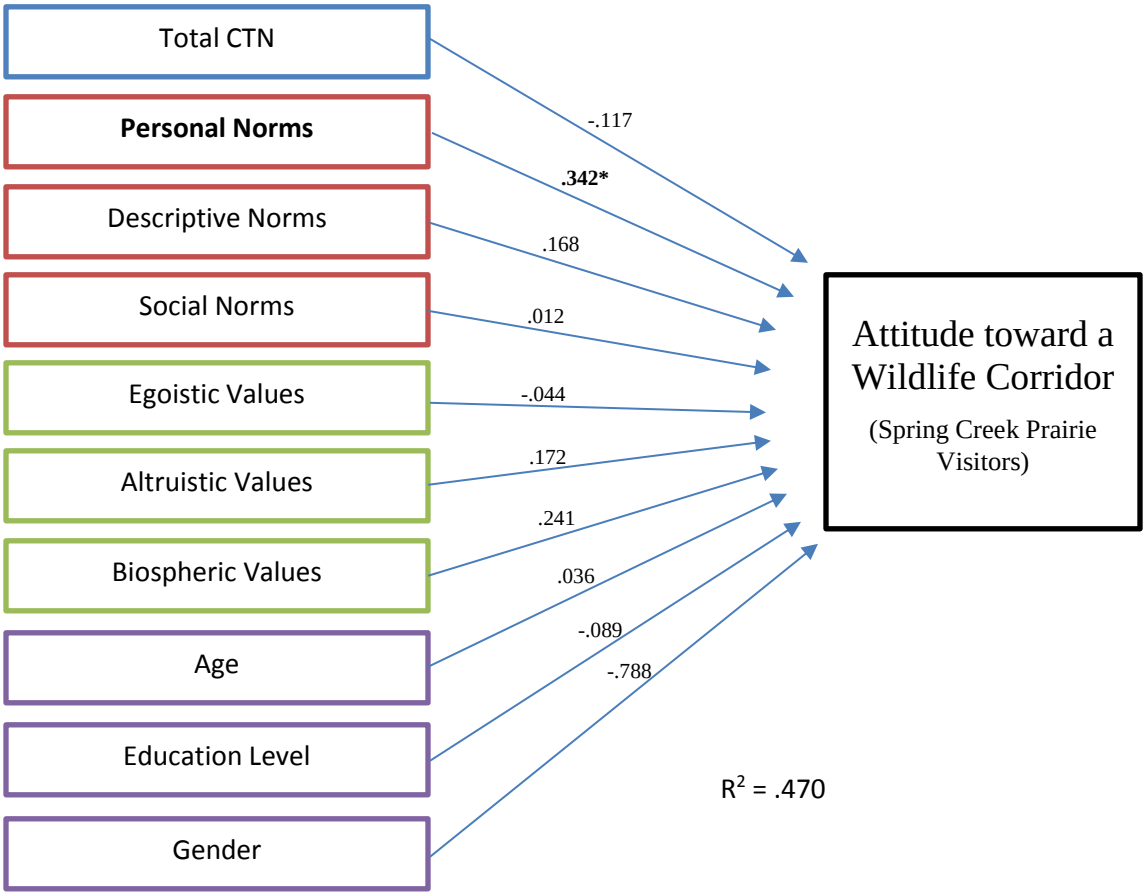

Figure 7. Model showing the relationship between connection to nature, norms, environmental values, and demographic measures and attitude toward a wildlife corridor among Spring Creek Prairie visitors. Beta values are listed. *p ≤ .05; **p ≤ .01. (Two-tailed tests).

Table 7.

Multiple regression Analysis Results for Spring Creek Prairie Visitors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.894	.538		5.377	.000		
	CTN	-.105	.119	-.117	-.879	.383	.532	1.881
	Per Norms	.212	.099	.342	2.137	.037	.370	2.700
	Des Norms	.122	.109	.168	1.122	.266	.421	2.378
	Soc Norms	.006	.082	.012	.079	.937	.396	2.525
	Ego Values	-.015	.036	-.044	-.426	.672	.894	1.119
	Alt Values	.069	.051	.172	1.352	.182	.585	1.711
	Bio Values	.118	.086	.241	1.375	.175	.307	3.260
	Age	.001	.003	.036	.356	.723	.907	1.102
	Ed	-.030	.035	-.089	-.859	.394	.880	1.136
	Gender	-.087	.110	-.085	-.788	.434	.811	1.233

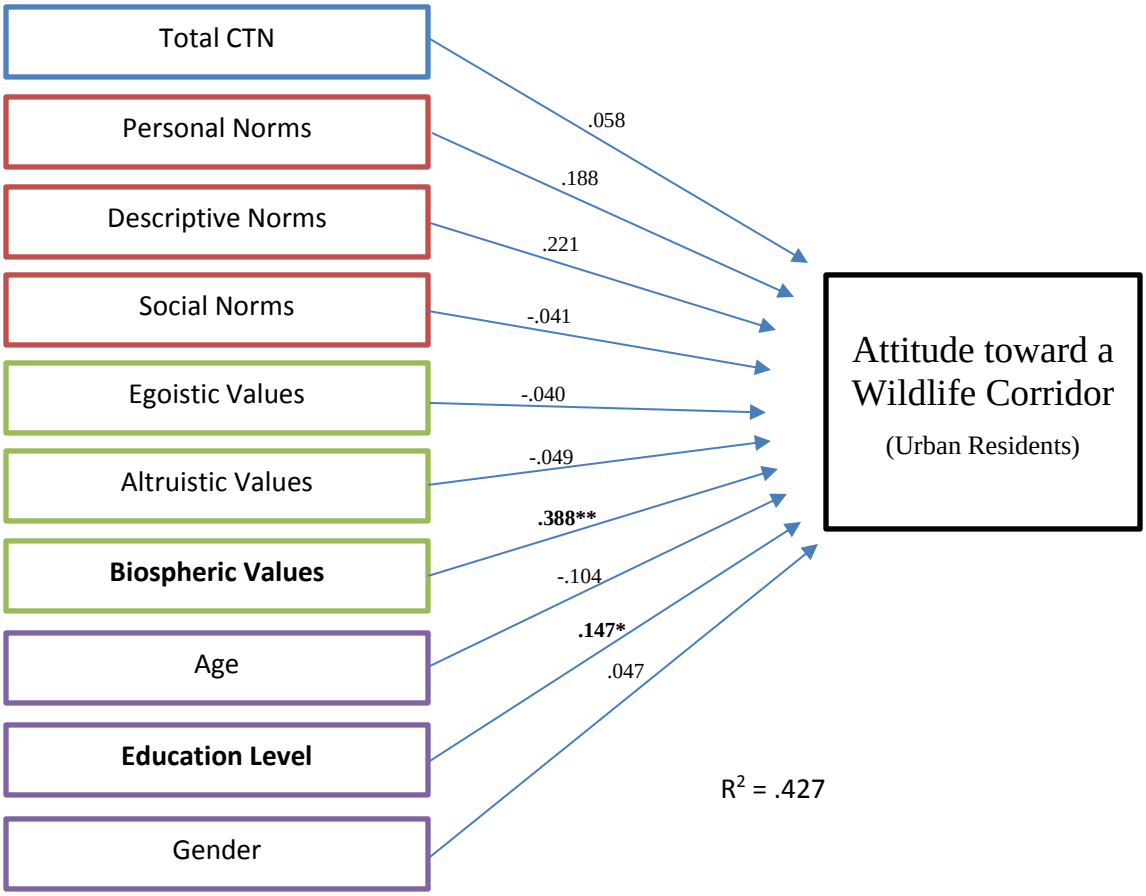

Figure 8. Model showing the relationship between connection to nature, norms, environmental values, and demographic measures and attitude toward a wildlife corridor among urban residents living near an existing wildlife corridor. Beta values are listed. *p ≤ .05; **p ≤ .01. (Two-tailed tests).

Table 8.

Multiple regression Analysis Results for Urban Residents

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.340	.538		2.489	.014		
	CTN	.071	.080	.058	.881	.380	.983	1.017
	Per Norms	.167	.107	.188	1.556	.122	.294	3.398
	Des Norms	.267	.145	.221	1.843	.068	.299	3.345
	Soc Norms	-.041	.105	-.041	-.394	.694	.400	2.500
	Ego Values	-.022	.038	-.040	-.579	.564	.913	1.095
	Alt Values	-.034	.068	-.049	-.498	.620	.445	2.245
	Bio Values	.232	.071	.388	3.254	.001	.303	3.300
	Age	-.006	.004	-.104	-1.496	.137	.892	1.121
	Ed	.082	.039	.147	2.112	.037	.893	1.119
	Gender	.081	.116	.047	.697	.487	.949	1.054

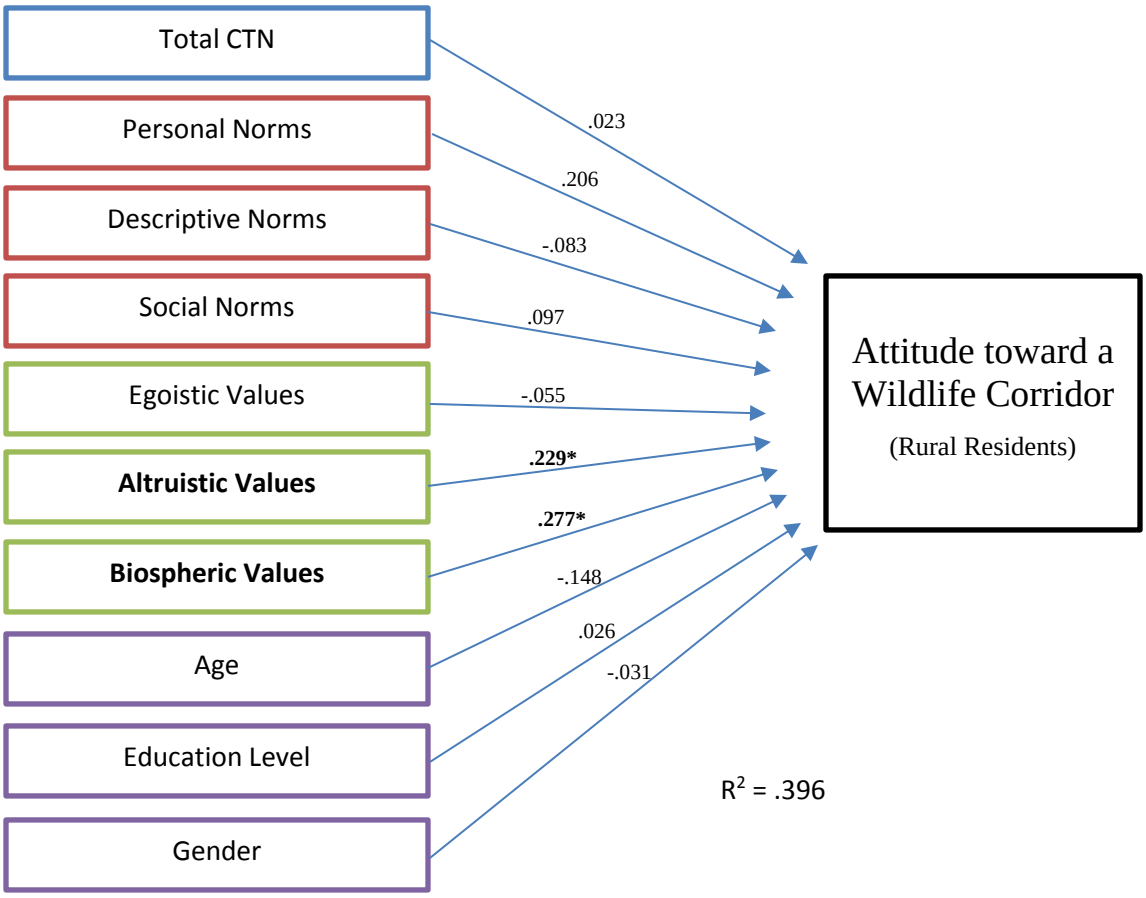

Figure 9. Model showing the relationship between connection to nature, norms, environmental values, and demographic measures and attitude toward a wildlife corridor among rural residents living near an existing wildlife corridor. Beta values are listed. *p ≤ .05; **p ≤ .01. (Two-tailed tests).

Table 9.

Multiple regression Analysis Results for Rural Residents

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.566	.697		2.247	.027		
	CTN	-.013	.101	-.011	-.130	.896	.936	1.069
	Per Norms	.259	.132	.274	1.967	.052	.315	3.178
	Des Norms	-.086	.203	-.066	-.423	.673	.251	3.981
	Soc Norms	.042	.164	.037	.258	.797	.296	3.379
	Ego Values	-.010	.049	-.016	-.200	.842	.915	1.093
	Alt Values	.147	.077	.204	1.895	.061	.526	1.900
	Bio Values	.166	.074	.265	2.244	.027	.439	2.280
	Age	.000	.000	.035	.443	.659	.956	1.046
	Ed	.023	.059	.034	.392	.696	.807	1.239
	Gender	-.077	.162	-.040	-.477	.635	.859	1.164

CHAPTER 5

Discussion

Discussion of Results

One of the main objectives of this study was to determine if certain segments of the population have a more favorable attitude toward a wildlife corridor than others. The results of this study indicate there is a significant different between park visitors (N = 152) and residents (N = 272). This is consistent with previous studies and supports the corresponding hypothesis stated in chapter 2 (H1: Park visitors are more likely to possess a favorable attitude toward a wildlife corridor than residents living near a wildlife corridor). Tere was no significant difference between Pioneers Park Nature Center (N = 77) and Spring Creek Prairie (N = 75) visitors or urban (N = 156) and rural (N = 116) residents.

Another objective of this study was to determine if connection to nature, environmental values, and norms were signifcantly correlated with attitude toward a wildlife corridor. Pearson correlation results indicate a significant correlation between connection to nature and attitudes, which is consistent with previous studies and supports the hypothesis stated in chapter 2 (H4: Connection to nature will be positively correlated with attitude toward a wildlife corridor). Personal norms, descriptive norms, social norms, altruistic environmental values, biospheric environmental values, and gender were significantly correlated with attitudes as well. This is consistent with previous studies as well (e.g. de Groot & Steg, 2010; Olive and Raymond, 2010; Johansson & Henningsson, 2011; Moon et al., 2012) and supports the hypotheses stated in chapter 2 (H5: Altruistic and biospheric environmental values will be positively correlated with attitude toward a

wildlife corridor; H7: Social and personal norms encouraging pro-environmental behaviors will be positively correlated with attitude toward a wildlife corridor).

Surprisingly, multiple regression analysis did not identify connection to nature as a significant predictor of attitude. Although the results varied between groups, personal norms and biospheric values were most often identified within the models as significant predictors of attitude, which is consistent with previous studies (e.g. de Groot et al., 2012). Interestingly all populations had one or more significant predictor of attitude, except the Pioneers Park Nature Center visitor population. None of the independent variables were significant predictors of attitudes within the Pioneers Park Nature Center visitor population. This seems reasonable considering the wide variety of people that visit the park, which is often referred to as a free tourist attraction.

Although demographic measures were not listed as hypotheses for this study, some demographic information (age, education level, and gender) was collected. Most demographics were not significant predictors of attitude toward a wildlife corridor. However, education level was a signficant predictor among all residents and urban residents.

Implications

As mentioned earlier, the Prairie Corridor on Haines Branch has taken on a collaborative management approach. Some progress has been made in gaining support of local residents; however, there is still resistence. According to interviews with the Lincoln Parks and Recreation Department and other officials, the plan has been reduced in width in some areas over concerns of potentially noxious weeds flourishing is sections of the wildlife corridor. In addition, residents have raised concerns about lack of privacy,

trespassing and litter along the accompanying trail, which is consistent with studies that focus specifically on attitude of residents living near recreational trails (e.g. Kaylen, Bhullar, Vaught, & Braschler, 1993; Ivy & Moore, 2007).

In this study, biospheric environmental values were identified as a significant predictor of attitude toward a wildlife corridor among rural residents currently living near an existing wildlife corridor – the most relevant population to the population being targeted for the Prairie Corridor on Haines Branch. de Groot et al. (2012) found that those with strong biospheric environmental values felt a stronger moral obligation (i.e. personal norm) to engage in pro-environmental behaviors. Therefore, the results of this study suggest rural residents would be more likely to favor participating in something they perceive as beneficial to the environment.

Furthermore, personal norms were identified as a significant predictor of attitude toward a wildlife corridor among all residents (urban and rural combined) living near an existing wildlife corridor. As stated earlier, personal norms are often significantly correlated with attitude toward conservation-related programs (Olive & Raymond, 2010; Johansson & Henningsson, 2011; Moon et al., 2012). In addition, personal norms are believed to have a greater ability to influence pro-environmental behaviors than social norms (Schwartz, 1977).

Unfortunately, these results do not provide us with any insight into why officials are witnessing opposition to the project. They do, however, suggest further research may be warranted to investigate whether a different approach would be more effective in gaining easements for the wildlife corridor. For example, the scale used to measure attitudes in this study was based on the goals outlined in the Salt Valley Greenway and

Prairie Corridor master plan (2012). Interestingly, the mean rating of one of the attitude statements (i.e. The Prairie Corridor will be good for the local economy) was lower than the other statements. However, the scale was not meant to distinguish between the different aspects. Therefore, the significance of these differences could not be tested.

Nevertheless, this does suggest more thought should be put into all of the possible factors influencing attitude. Others have investigated perceived benefits (Driver, Brown, & Peterson, 1991), perceived economic benefits (Jurowski, 1994; Jurowski, Uysal, & Williams, 1997), community satisfaction (Theodori, 2004; Payne & Schaumleffel, 2008) and place attachment/sense of place (Kyle, Graefe, Manning, & Bacon, 2004; Cross, Keske, Lacy, Hoag, & Bastian, 2011). Therefore, further research may consider starting with these concepts as factors influencing attitude toward a wildlife corridor.

This, in turn, could lead the investigation toward identifying potential barriers and help officials find ways to work around those barriers. This is the first step in using a community-based social marketing strategy, which may offer an alternative to collaborative management (McKenzie-Mohr & Smith, 1999). To accomplish this, officials would need to conduct a qualitative study that observes current trends, hosts focus group discussions among representatives of the target population or conducts a survey of the broader population (or a combination of these techniques).

Qualitative research has several advantages over quantitative research. Most notable, however, is the ability of qualitative research to recognize and analyze different perspectives, especially when the target population is relatively small (Milena, Dainora, & Alin, 2008). In other words, qualitative research is better suited for exploring “why” rather than “how many”. As stated above, the overall model for rural residents explained

39.6% of the variance. Therefore, qualitative research may help uncover additional underlying factors that could ultimately explain in further quantitative research an even larger portion of the variance in attitude toward a wildlife corridor.

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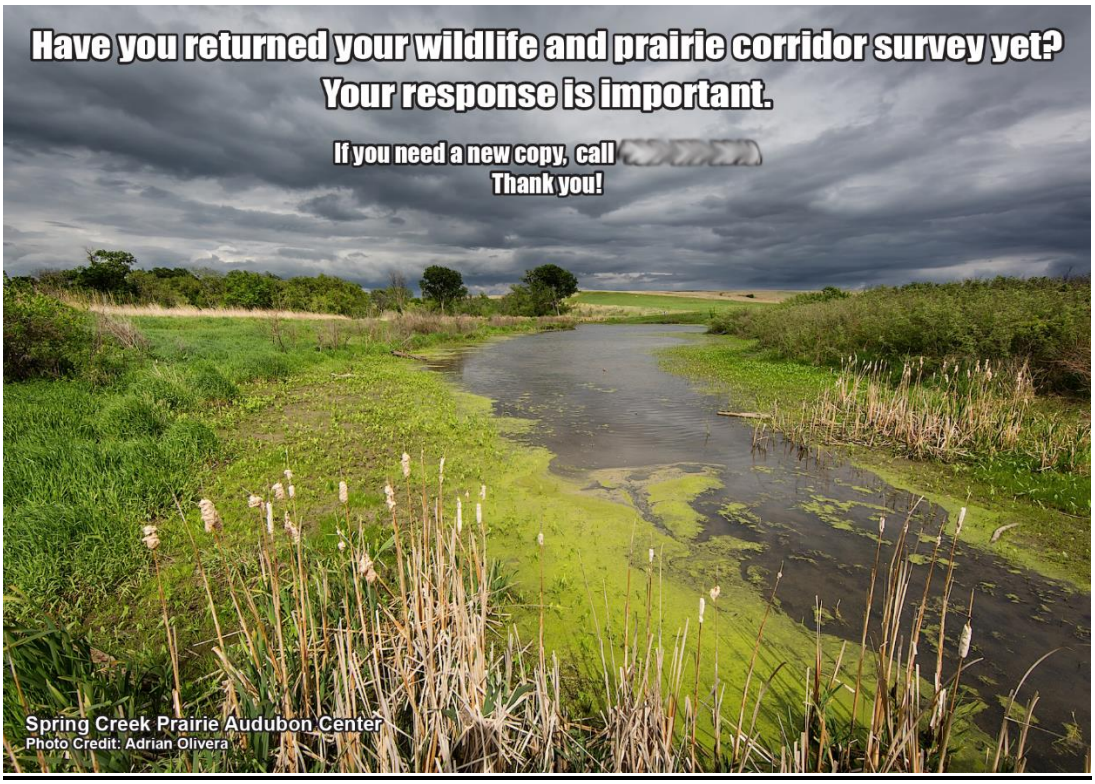
APPENDIX A: POST CARD EXAMPLES



APPENDIX B: SURVEY EXAMPLE

Wildlife and Prairie Corridor Survey

Please complete this survey and return it to the researcher. There are no right or wrong answers – just your answers. Read each statement and answer as honestly as you can.

Nature

Use the following scale to rate your level of agreement with each of the following statements.

Entirely Disagree **Entirely Agree**
1 2 3 4 5

1. Watching wildlife fills me with awe…… 1 2 3 4 5
2. I feel sorrow because we are destroying too much nature…..…….... 1 2 3 4 5
3. I have spiritual feelings that are nature-based…….…….. 1 2 3 4 5
4. I'm connected to nature much like I'm connected to my family …… 1 2 3 4 5
5. Hiking alone in the wilderness would make me nervous……..... 1 2 3 4 5
6. Listening to the wind go through the trees calms my mind…..…….. 1 2 3 4 5
7. I often feel a sense of oneness with the natural world around me…..…….. 1 2 3 4 5
8. Nature provides me with a spiritual connection……..… 1 2 3 4 5
9. I have seen things in nature that were so amazing; they just filled me with awe ……. 1 2 3 4 5
10. Seeing how much nature is destroyed affects me emotionally…….. 1 2 3 4 5
11. Nature is a huge part of what I am……..... 1 2 3 4 5
12. If I went hiking, I would be too afraid of all the bugs or snakes to enjoy myself……..…….. 1 2 3 4 5
13. My love for nature is a big influence in my life…….…….. 1 2 3 4 5
14. The power of nature is just incredible…… 1 2 3 4 5
15. When people don't think about the long term impacts of their actions on nature it upsets me… 1 2 3 4 5
16. Feeling part of nature is a spiritual experience…… 1 2 3 4 5
17. Time in natural areas breaks down all the stress until I feel completely refreshed…….. 1 2 3 4 5
18. My feelings towards nature form a big part of my identity…… 1 2 3 4 5
19. When I'm alone in a natural area, I have this feeling of complete calm…….... 1 2 3 4 5
20. The magnitude of nature is awe inspiring……..... 1 2 3 4 5
21. It is upsetting when people want to sweep environmental problems under the rug……..…… 1 2 3 4 5
22. I have too much fear of nature to go camping…… 1 2 3 4 5
23. My feelings for nature have influenced my spiritual beliefs……... 1 2 3 4 5
24. When I need to relax, I spend time in nature…… 1 2 3 4 5
25. When surrounded by nature, I feel at peace…….…… 1 2 3 4 5
26. A lot of nature scares me……..... 1 2 3 4 5

Social

Use the following scale to rate your level of agreement with each of the following statements.

Entirely Disagree **Entirely Agree**
1 2 3 4 5

1. I feel guilty if I do not act pro-environmentally……..... 1 2 3 4 5
2. Most people from my city act pro-environmentally…… 1 2 3 4 5
3. My friends expect me to act pro-environmentally……..... 1 2 3 4 5
4. I feel morally obligated to act pro-environmentally……..…… 1 2 3 4 5
5. My friends act pro-environmentally.……..…… 1 2 3 4 5
6. My neighbors expect me to act pro-environmentally……..…… 1 2 3 4 5
7. I feel proud when I act pro-environmentally……..…….. 1 2 3 4 5

8. My family members act pro-environmentally……..…… 1 2 3 4 5
9. My family members expect me to act pro-environmentally…… 1 2 3 4 5
10. My family members expect me to purchase green products……..…….. 1 2 3 4 5
11. I would violate my principles if I did not act pro-environmentally…….. 1 2 3 4 5
12. People like me act pro-environmentally……..…….. 1 2 3 4 5

Environment

Rate the importance of the following 12 values "as a guiding principle in your life".

	Opposed to My Values			**Not Important**						**Extremely Important**	
	-1		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	
1.	Control over others, dominance……	-1	0	1	2	3	4	5	6	7	
2.	Equal opportunity for all……..	-1	0	1	2	3	4	5	6	7	
3.	Protecting natural resources……...	-1	0	1	2	3	4	5	6	7	
4.	Material possessions, money……	-1	0	1	2	3	4	5	6	7	
5.	Free of war and conflict……...	-1	0	1	2	3	4	5	6	7	
6.	Harmony with other species…….....	-1	0	1	2	3	4	5	6	7	
7.	The right to lead or command……	-1	0	1	2	3	4	5	6	7	
8.	Correcting injustice, care for the weak……..	-1	0	1	2	3	4	5	6	7	
9.	Fitting into nature……..	-1	0	1	2	3	4	5	6	7	
10.	Having an impact on people and events……	-1	0	1	2	3	4	5	6	7	
11.	Working for the welfare of others……	-1	0	1	2	3	4	5	6	7	
12.	Preserving nature……..	-1	0	1	2	3	4	5	6	7	

Lincoln Greenway Wildlife and Prairie Corridors

The Greater Lincoln community is linked by a series of greenways that consist of wildlife, prairie, stream, and recreational corridors. Several corridor expansions are proposed or under development, including a corridor linking Pioneers Park with Spring Creek Prairie Audubon Center southwest of Lincoln. The long-term strategy of the greenway system is to expand prairie and riparian (i.e. stream) habitat areas, build recreational and educational connections, and promote the enhancement and preservation of green spaces.

	Entirely Disagree				**Entirely Agree**				
	1	**2**	**3**	**4**	**5**				
1.	I support the greenway corridor expansion of prairie and riparian (i.e. stream) habitat areas.....	1	2	3	4	5			
2.	I support building recreational trails in the wildlife and prairie corridors……..……..	1	2	3	4	5			
3.	Developing educational programs associated with the corridors is a good idea……	1	2	3	4	5			
4.	Expanding wildlife and prairie corridors will benefit the Lincoln/Lancaster County community	1	2	3	4	5			
5.	I support a voluntary, incentive-based approach to land and easement acquisition associated with the wildlife and prairie corridors……..	1	2	3	4	5			
6.	The wildlife and prairie corridors will be good for the local economy……..……	1	2	3	4	5			

Demographics

Year you were born 19____

Education: ◯ Less than High School ◯ High School/GED ◯ Some College ◯ 2-year College
◯ 4-year College ◯ Master's degree ◯ Doctorate Degree ◯ Professional Deg.

Gender: ◯ Male ◯ Female

APPENDIX C: CONSENT FORM EXAMPLE

University of Nebraska Lincoln

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
SCHOOL OF NATURAL RESOURCES

INFORMED CONSENT FORM

Title: Attitudes Toward Wildlife and Prairie Corridors and Connection to Nature

Purpose:
The purpose of this study is to explore the potential relationship between attitudes toward wildlife and prairie corridors and connection to nature. You must be 19 years of age or older to participate. You are invited to participate in this study because you are visiting one of two parks that a proposed corridor (i.e. Prairie Corridor on Haines Branch) will connect, Pioneers Park or Spring Creek Prairie Audubon Center.

Procedures:
You are being asked to complete the survey and return it to the investigator. Completing the survey should take about 10 minutes.

Benefits:
There are no direct benefits to you as a research participant.

Risks and/or Discomforts:
There are no known risks or discomforts associated with this research.

Confidentiality:
Any information obtained during this study which could identify you will be kept strictly confidential. The data will be stored in a secure location and will only be seen by the investigator and her advisor during the study and for 3 years after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings. However, the data will be reported as aggregated data.

Opportunity to Ask Questions:
You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may contact the investigators at the phone numbers below. Please contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a research participant.

Freedom to Withdraw:
Participation in this study is voluntary. You can refuse to participate or withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy:
You are voluntarily making a decision whether or not to participate in this research study. Your completion and return of this survey certifies that you have decided to participate having read and understood the information presented. You should keep a copy of this consent form for your records or if you have any future questions.

Name and Phone number of investigators:

Erin Kubicek, Principal Investigator Phone: [redacted]
Mark Burbach, Ph.D., Secondary Investigator Office: [redacted]