Fundamental Insight to Protect Ecosystems: Factors Influencing Residents' Acceptance of Land Conservation in Boulder, Colorado

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Abstract

Land conservation has become an essential scientific field for protecting our environment, species, and resources. While the benefits of land conservation are well known, there is still criticism from communities and individuals. The City of Boulder, Colorado is often revered as a celebrated example for land conservation and its residents' participation in conservation initiatives. Through an in-person survey, this honors thesis examines what factors influence Boulder residents' acceptance of land conservation. By pinpointing the factors that impact an individuals' acceptance of land conservation efforts, government officials, nonprofit organizations, and communities can target their land conservation initiatives to appeal to those significant and influential factors. Through a quantitative and qualitative study this honors thesis concludes that salary, visitation, and political affiliation are the main factors influencing approval of land conservation sites. In addition, the study finds that preservation and aesthetics are also powerful influences correlating with support for land conservation. Through these conclusions it becomes evident that environmental privilege is present in Boulder, and that experiences with nature and progressive attitudes are widespread and crucial for conserving land. While Boulder has been impressively successful in conserving ecologically important land, the aesthetics of the land for Boulder's "Backdrop" is a dominant consideration for residents. The conclusions of this study not only provide insight for the City of Boulder, but its results can be applied to help other cities promote and conserve important land.

Key Words: Land conservation, nature, ecosystems, environmental privilege, survey, and Boulder's Backdrop

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Preface and Acknowledgments

Growing up in Northern California I was fortunately exposed to wildlife and nature from a very young age. From participating in my county's Nature Bowl to walking my dog along my city's Riparian Corridor, I have always been fondly attracted to nature. I attribute my career aspiration to conserve land for ecological purposes and for fostering the topic of my undergraduate Honors Thesis to these early life experiences.

I am eternally grateful to my supportive family and friends who have encouraged and assisted me throughout my Honors Thesis endeavor. I am incredibly appreciative of my parents for their endless support and enthusiasm towards my academic career. Their devoted encouragement, along with my sister Liz's, has meant the world to me and the completion of this thesis would not have been possible without their support and love. Also, huge thanks to Reid for engaging in discussions regarding my thesis and providing encouragement when I needed it most.

My committee members Dale Miller, Abby Hickcox, and David Brown have stimulated the development of my thesis topics and ideas throughout the entire process. Thank you for your time, feedback, and critiques. The advice and guidance I have received through my Honors Thesis committee has exponentially enhanced my educational experience and allowed me to grow as a scholar. Thank you for always being available to answer my questions and engage in discussions regarding Boulder and land conservation.

Lastly but of no less importance, I would like to give a special tribute to both my hometown of Davis, California and my second home of Boulder, Colorado. These cities and communities have been extraordinary places to grow and develop as an individual. Their abundant commitment to the environment and outdoors has promoted my eco-centric persona and aided in my career development. I am grateful to have lived in such progressive communities with a strong desire to protect and conserve the environment in a manner parallel to my own aspiration.

Introduction

Protecting land and nature has been a vigorously debated subject since the mid-1900s. The Front Range of Colorado is renowned for its magnificent mountains, abundant wildlife, and flourishing vegetation. Those beautiful landscapes and open spaces encourage an active and exuberant lifestyle for adjacent residents. The individuals inhabiting the environs of the Colorado Front Range represent a diverse community of residents with polarized opinions regarding conserving land as opposed to increasing development. As the Colorado population is continuing to grow at unprecedented rates, new initiatives and projects are frequently proposed, accepted, and rejected to try to mitigate the development of natural land in order to preserve its ecological significance. My study for this thesis took place in Boulder, Colorado, a city renowned for its ecocentric culture.

The research question driving this honors thesis is: What are the main factors influencing individuals' acceptance or disapproval of land conservation? Boulder is a unique community that has dedicated its capital, land, and labor resources to protecting nature. Through an in-person survey conducted throughout Boulder, insight into the influence of individuals' contexts regarding land conservation efforts emerged. Analyzing the survey results allowed for a comprehensive understanding regarding what factors and dynamics are essential to concentrate on during campaigns to gain support for land conservation projects. This thesis gives a detailed account of the background of the City of Boulder and the city's conservation initiatives, the methods utilized for this project, the results of the study, and the discussion of important themes, closing with the conclusions of the study.

My primary research was collected in the form of an in-person survey. The objective of my research was to examine what factors cause individuals to accept land conservation projects.

I demonstrate how various contexts affect Boulder residents' acceptance and support for land conservation. After examining which factors impact an individual's acceptance for or opposition to land conservation projects, I synthesize my results to enable other communities to understand what factors influence the acceptance of land conservation projects. This method will allow my conclusions to be adapted by other communities to aid in targeting the underlying factors behind land conservation. This research is relevant for our increasingly changing human landscape and human expansion into previously vacant, natural land. The human population continues to expand and develop land at unprecedented rates. With governments, communities, lobbyists, and professionals working to try to mitigate the take-over of our natural landscapes, understanding what contexts and factors influence the Boulder community residents' acceptance of land conservation projects is crucial.

This study aimed to provide valuable insight into how the individual backgrounds of Boulder city residents influence their approval of land conservation. By the end of this study, the conclusions drawn in this paper will fill a notable gap in the conservation field by demonstrating what factors lead to individuals' approval or disapproval of conservation efforts. This information is vital for the increasingly difficult task of conserving land. Through the City of Boulder's government, the Nature Conservancy, and numerous other environmentally centered organizations, there is ample evidence supporting the importance of conserving Boulder's adjacent ecosystems and land. What is lacking has been information behind why community members are so dedicated to land conservation. Boulder Open Space and Mountain Parks has conducted ample projects to determine who is utilizing the land conservation sites and for what activities. This thesis provides the answer to what is currently missing: what factors influence an individual's acceptance of land conservation.

Background

A brief background of the City of Boulder, conservation efforts, and theories of nature will provide a context for my senior honors thesis. Through the background and analysis of the literature, the reader will gain an understanding of contemporary issues concerning nature, the culture of Boulder, various methods for valuing land, the geography of the city, and the various conservation techniques employed throughout the city and adjacent areas. This background will aid the reader in understanding the purpose and importance of this study.

Nature

To discover the factors that led to Boulder community members' acceptance of land conservation initiatives, a precise understanding of the concept of the natural environment—what exactly is being conserved—is important. The concept of nature and what elements comprise land as nature has been a passionately debated topic in the scientific community. Through the work of environmental historian William Cronon and French philosopher Michel Foucault, along with dozens of other scholars, a consensus has been reached regarding the social construction of nature —the concept that nature is different for everyone depending on their direct experience with it—but a prevailing definition of nature has yet to be determined. For this study, "nature" will be defined as: all the features and products of Earth that encompass the non-human physical world.

The purpose of stating a specific definition of nature is to ensure that this study designates exactly what is being conserved. This study will regard nature as separate from creations by human. Therefore, the areas of focus for this study are spaces of land that are not constructed by humans. This does not eliminate land that has incurred human influence or alteration, which would be inevitable given the reach of human civilization, but this specific

definition of nature disregards artificial objects that are created or produced by human societies. Stating a precise definition of nature will aid in identifying what land areas this study is referencing.

Because of the social construction of nature, scholars argue that our definition of nature is the root cause for the current environmental crisis. Nature is a social concept forged through the context and discourse in which the term is used (Robbins, 2012; Greider & Garkovich, 1994; Demeritt, 2002; Heberlein, 2012). Proponents of the social construction of nature argue that nature is a social phenomenon impacted by political and cultural contexts. Throughout human communities, nature is viewed as a pristine, untouched wilderness often separate from human civilization (Demeritt, 2002). This view of nature is troubling, as it does not include the land and nature in cities, suburbs, and areas under the influence of human populations. Idolizing nature as an untouched wilderness eliminates a large portion of land, often viewed as inadequate to conserve (Cronon, 1996).

Various scholars and authors support the social construction of nature, prolonging the debate regarding what comprises nature. In the article, *What is nature? – ziran in early Daoist thinking,* author Jing Liu argues that nature is seen as an object or resource, utilized to satisfy humans' needs (2016). Paul Robbins supports this theory of nature throughout his book. Robbins states "The environment is arguably an invention of our imagination…ideas about nature inevitably reflect our social world" (2012, p. 127). Through this statement Robbins is demonstrating that how an individual or society defines nature is contingent upon experiences with the environment. The definition we assign to nature impacts the way in which we understand and interact with land daily. The nineteenth-century philosopher Immanuel Kant also supported this theory by arguing how powerful philosophical knowledge is on influencing our

ideas and facts (1908). Kant, along with various other authors, suggested that physical objects conform to our perceptions, and therefore experience and philosophical knowledge is precedent to an individual's experiences (1908; Heberlein, 2012; Demeritt, 2002). These three scholars—Liu, Robbins, and Kant—all agree that nature is a social phenomenon, created by individuals' relationships and experiences with the environment.

Ecocentric Culture

Boulder is continuously ranked as a top travel destination to visit the outdoors. This designation reflects the ecocentric culture and environmentally centered community. For decades Boulder has been a leader among United States cities for prioritizing the protection of the environment. This makes Boulder a unique ecocentric community. "Ecocentric" in this study will be utilized to mean having concern for environmental issues. It is important to understand how Boulder's ecocentric culture developed and persists in determining the factors that influence Boulder residents' approval of future land conservation. While the City of Boulder's land conservation efforts are recorded as far back as 1898, for this study we will focus from the period 1959 onward. Through progressive measures decided upon by the city council and residents of Boulder, the city's commitment to protect and conserve its land and environment is prominent.

Boulder's commitment to protecting its land became heightened in 1959 with the approval of the Blue Line. This almost 60-year-old boundary bans the city from providing water to anyone west of the 5,750-foot line (Snider, 2009). The creation of this boundary made it economically unfeasible for development to occur within these prized foothills, and aided in preserving open space (Larmer, 1994). Presently, the Blue Line is often regarded as an initiative for the sole purpose of environmental protection, but historically other social values and concerns were also main priorities (Hickcox, 2012). A prominent factor influencing the creation

of the Blue Line was the city administration and city manager's concern for the cost to maintain and extend water and sewer infrastructure for a growing urban area (Hickcox, 2012). While various social and economic factors influenced the creation of the Blue Line, ultimately this land was successfully conserved. Following the achievement of the Blue line, PLAN-Boulder was created. This organization lobbied for the Open Space tax and is credited with forming the Open Space and Mountain Parks governing body. These early community based land conservation initiatives demonstrate Boulder's ecocentric culture.

In November 2012, the City of Boulder was among the first United States cities to implement a disposable bag fee ordinance. Ordinance No. 7870 was approved by the City Council with a 7-1 vote for approval (Clough, Jones, & Daniels, 2013). This ordinance requires a 10-cent fee on all disposable grocery bags, and its nearly unanimous approval demonstrates the city's ecocentric commitment. Similarly, Boulder's approval of a sales tax designated for purchasing and maintaining open space in 1967 demonstrates its commitment to conserving land. This Open Space sales tax passed by a 57% majority and was re-approved in 1989 with a 76% majority (Jackson, 2005). The support for a self-imposed tax by residents demonstrates the community's support for land conservation. The now .88 percent retail sales tax, has aided in the city's acquisition of open space.

Boulder has been a leader throughout the United States as a city determined to preserving its land and environment. This ecocentric culture is distinctive to Boulder and is an important factor in understanding the characteristics of the people that live there. While the ecocentric culture of Boulder has had a profound influence upon conservation initiatives within the city, various social and economic factors cannot be forgotten for their vital role. These social concerns and factors will be further outlined in the discussion section. From community movements to

self-imposed taxes, the Boulder community has worked hard to conserve the city's land and open space.

Methods for Valuing Land

Natural land serves an essential role in the everyday life of humans, not just for individuals' livelihood and wellbeing, but also for morale and enjoyment. Conservation initiatives are designed and tailored for specific reasons, but their ultimate purpose is to protect environments and ecosystems. Numerous contexts influence land conservation, and insight into those contexts aids in understanding the purpose of these conservation efforts. As humans, we depend on land and nature to survive and prosper; safeguarding these spaces is important for a multitude of reasons: for economic, aesthetic, and intrinsic values.

The first rational for valuing land and nature is due to exploiting the land's resources for economic growth. We depend on land for its materials and utilize those materials to live our everyday lives. In the article *Value in Nature Itself,* it is stated that "we derive our food, water, air, building material, clothing, etc., from nature. We mine its ores, cut its trees, harvest its fish, and develop its land" (Pojman and Pojman, 2012, p. 104). Human society has demonstrated that it values land and nature due to the economic dependence we have on its resources (Wallace, Theobald, Ernst, King 2008; Sease, 1998). Fausold and Lilieholm's (1996) article, *The Economic Value of Open Space*, also demonstrates a need to value the economic worth of land due to its importance in producing public goods and services (p. 104; Sease, 1998). Not only do the resources present on land provide economic incentive, but the creation of conservation areas increases property values, as these sites are viewed desirable. Valuing land for the economic benefit it provides demonstrates a need to value land for the use of its resources and what economic advantages land offers us.

A second way to value land is for the aesthetics it provides. From forests, streams, and mountains, natural land is beautiful and provides an inspiring sensation. The aesthetics of land serve as a place for moral and spiritual rejuvenation (Pojman & Pojman 1996, p. 104). From time immemorial, specific Colorado lands have been regarded as spiritual places. From ancient hearths and fire rings, there is evidence of land that has been valued and prized for its spiritual benefits (Sease, 1998; Wright, 1993). The aesthetics and presence of natural, open land provides an escape from industrialized, urban communities. Valuing land for the aesthetic pleasure it provides focuses on a non-use value. Comparable to valuing land for its source of economic benefits, valuing land for its aesthetic purpose still focuses on regarding land for what it offers us, but that valuation is less exploitative.

The final argument proposed in this thesis for promoting the conservation of land is to value the space simply for its intrinsic value. This value of nature is intensely argued in the academic world, as it is often difficult for individuals to value nature just for nature's sake. For this study, I will utilize the intrinsic value of nature as one of the methodologies for supporting land conservation efforts. Holmes Rolston III, a professor at Colorado State University, argues against this valuation by demonstrating that it becomes hard to value nature for nature's sake because it is conceptually difficult to disconnect nature from humans. Rolston states, "Nature comes to have value only when humans take it up in their experience" (Rolston, 2006, p. 106). Therefore, this valuation of nature is difficult to gain widespread public support for, since many individuals' experiences with nature are intertwined with their concept of nature. Valuing nature for nature's sake is a contested, but important, method for valuing nature because recognizing the intrinsic value of land and nature is important for justifying and determining appropriate conservation goals (Sease, 1998; Wallace, Theobald, Ernst, King, 2008; Pejchar, Morgan,

Caldwell, Palmer, Daily, 2007). In contrast to Rolston's view of the intrinsic value of nature, this study will utilize a subjective intrinsic value. Ronald Sandler defines the subjective intrinsic value view in his article as valuing an object, in this case land, for what it is, rather than for what it can bring about (2012). Identifying how the Boulder community values land is essential to understanding the factors that influence residents' attitudes regarding land. While the intrinsic value of land is a hotly debated subject in academia, for this study it will serve a vital role in determining the factors influencing individuals' acceptance of land conservation.

Geography

The Colorado Front Range, a section of the southern Rocky Mountains, is the first mountain range encountered moving west across the North American Great Plains. Specifically, the Colorado portion of the Front Range spans 415 square miles running roughly north-south and is known as the gateway to the Rocky Mountain National Park (Noel & Smith, 2011). This magnificent mountain range is remarkable for rising across the West nearly 10,000 feet above the Great Plains. Boulder, Colorado is situated just to the east of this mountain range and is renowned for the city's view of the Flatiron Peaks. Due to the Front Range's ability to moderate weather and block storms, this region creates an ideal environment for human settlement. The

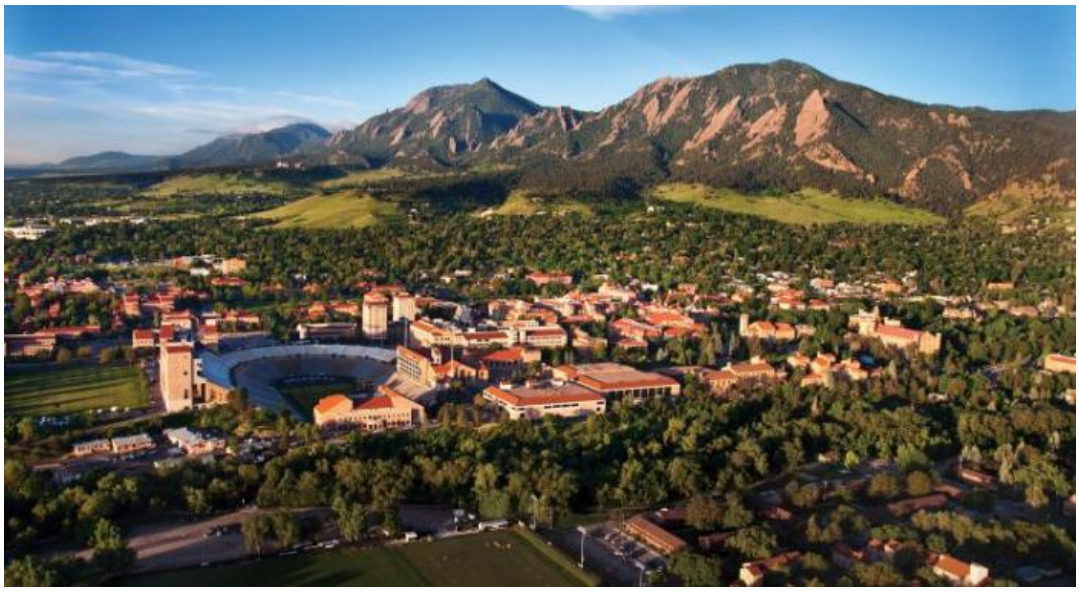


Figure 1: Photo of the City of Boulder situated against the Flatiron Mountains (Photo by Glenn Asakawa/ University of Colorado)

specific geography of Boulder and role it role it plays in the community greatly influence the cities endorsement for land conservation.

The Flatirons have become synonymous with Boulder and serve as the city's most prized landmark (see figure 1). These peaks preside over the city and influence the culture of the community. Boulder, famous for its ecocentric and adventurous identity, attracts individuals with specific personality traits. Outlining the city on one side are the Rocky Mountains and on the other side rolling hills, easily making these prized landscapes accepted conservation sites. The geography of the city is greatly responsible for enhancing the city's character. Boulder is renowned for its adventurous, outdoors-oriented lifestyle, which can be credited to the city's geography. Illustrative of this lifestyle, *Business Insider* recently posted an article listing Boulder as the number one healthiest city in America. The article attributed Boulder's healthy lifestyle to the abundance of outdoor activities easily accessible from the city center (Pipia, 2016). With the Flatirons towering over the city, there are few places where their presence and influence does not extend. During the original city planning and Boulder Open Space and Mountain Parks initiatives, two environmental values dominated the policy decisions: aesthetics and recreation (Hickcox, 2012). These motives for conserving land are still extremely prominent in the character and influence of the city, but regardless of the original intention, a significant amount of land in and surrounding Boulder has been conserved. The character of Boulder is continuously influenced by the vast amount of land conserved that surrounds the city and perpetuates the continuation of land conservation.

Within the conservation field, it is well established that mountain ranges provide niches for an abundance of species and enhance biodiversity. With Boulder nestled into the base of the mountains, the ecology of the land further influences the need for conservation. Boulder

residents live near a rich ecosystem, filled with life (Open Space and Mountain Parks Acquisition Update, 2013). This proximity to such an integral ecosystem allows the residents of Boulder to gain a better understanding of the need for this region's conservation. Neetu Sharma demonstrates this in her article, "Mountains, due to their exclusive and inimitable biodiversity, are recently receiving priority for biodiversity conservation in global agendas" (2014). Boulder's backdrop is composed of a rare ecological richness, making Boulder a unique geographic region. Much research has been dedicated to discovering the importance of high elevation landscapes: "Mountain ecosystems are bio-geographically unique, with high species diversity supported by their ecological, phytogeographical and evolutionary factors and high degree of endemism" (Bhatt & Viswanathan, 2014, p. 920). The biodiversity and unique geography surrounding Boulder make it an important location for conservation. Since critical ecosystems are at stake, this geographic feature of Boulder aids in promoting conservation efforts.

Colorado Land Conservation

Boulder uses a variety of methods to conserve both public and private land. Implementing numerous different procedures for conservation initiatives allows the city of to produce more viable and successful projects. The City of Boulder Open Space and Mountain Parks Acquisition has built its land conservation program through more than 400 individual transactions (Open

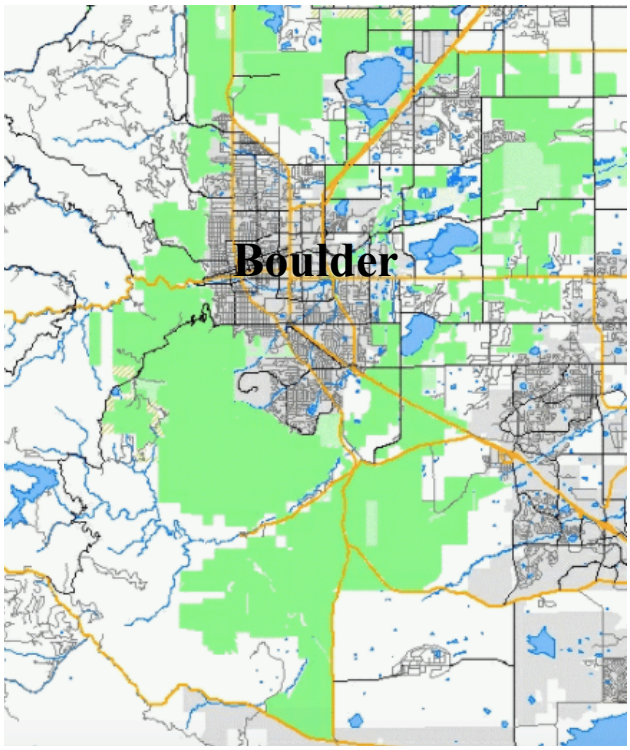


Figure 2: Map of Conserved Land in and around the City of Boulder in 2005 (Open Space and Mountain Parks Acquisition Update, 2013)

Space and Mountain Parks Acquisition Update, 2013). This has enabled the city to own and protect over 45,000 acres of land designated as Open Space in and surrounding the City of Boulder, (see Figure 2), (Open Space and Mountain Parks Acquisition Update, 2013). The conservation techniques and agencies introduced in this section are utilized to help protect Boulder's natural land.

The first and most-routinely used method that the City of Boulder utilizes to obtain land for conservation is through acquisitions. An acquisition occurs when property is purchased directly by the city for the sole purpose of conservation and for designating the land as Open Space. The price of these properties is decided by the fair market valuation of the land. On average, the City of Boulder spends about $20,000 per acre to acquire property. Acquisitions are nearly exclusively funded through the City of Boulder's Open Space Fund (Open Space and Mountain Parks Acquisition Update, 2013). This fund receives its income through the sales tax revenue, previously discussed in the "Ecocentric Culture" sub section. Out of the current retail sales tax, 0.88 cents of every dollar spent is dedicated to Open Space and Mountain Parks (Open Space and Mountain Parks Acquisition Update, 2013). Currently the fund allocates about $3.4 million annually to acquire land. A second major way the City of Boulder acquires land for conservation is through donations of suitable land. A major benefit of donating land to Boulder for conservation for the donor is to obtain transferable tax credits. These credits, up to $375,000 in state income tax credits, can be carried forward for up to 20 years and used as needed, or may be sold to others. The final method through which Boulder regularly acquires land is through conservation easements and development rights agreements. This method utilizes legally enforceable agreements between the City of Boulder and the landowner. According to these agreements, the landowner does not give up full ownership of the property but agrees to preserve

the environment and ecosystems of the land (Wright, 1993). This land is conserved through restricting commercial and residential development. Through these three methods of acquisition, the City of Boulder has set a precedent for other communities' land conservation initiatives.

During the 1900s, Americans across the country were becoming increasingly frustrated with federal, state, and local governments' failure to protect land from urbanization (Wright, 1993). This concern spurred the creation of private, non-profit organizations known as land trusts. Multiple land trusts operate in Boulder and aid in the private acquisition of land for conservation. These organizations primarily acquire land through conservation easements. These private, non-profit organizations receive funds through donations and grants, which are then used to purchase the land and conservation easements (Wright, 1993). While each sub section of the Front Range has its own individual organization for conserving land, cumulatively a substantial portion of this area has been conserved privately through land trusts.

Methods

To test the various factors influencing individuals' acceptance or rejection of land conservation initiatives, a questionnaire and a statistical analysis were utilized. Through the questionnaire, respondents were asked to answer a range of questions that allowed for insight into the factors that influence their acceptance of land conservation. Following the data collection, a statistical analysis was utilized to summarize and develop conclusions. The survey focused mostly on collecting quantitative data, although there was also a qualitative component to this study. Groves et al. (2011) state in their article that "a defining characteristic of surveys as we see them is that they are designed to produce statistical descriptions of populations" (p. XVI). Based on this assumption, conducting a survey and gathering quantitative data was determined to be the optimal method in determining the most influential factors in the acceptance of land

conservation initiatives. Because of the use of human subjects, this study was reviewed and approved by the University of Colorado, Boulder's Institutional Review Board.

Study Approach

This study utilized both quantitative and qualitative methods to conduct a descriptive study which analyzed the factors influencing the City of Boulder residents' acceptance of conservation efforts. Using both quantitative and qualitative data was selected as the optimal methodology due to its ability to provide an in-depth study into multifaceted phenomena within multiple contexts. Todd Jick defines this form of research strategy as a convergent methodology; he states, "These various notions share the conception that qualitative and quantitative methods should be viewed as complementary rather than as rival camps" (1979, p. 602). Ashatu Hussein also advocates for a convergent methodology:

> Using both qualitative and quantitative paradigms in the same study has resulted into debate from some researchers arguing that the two paradigms differ epistemologically and ontologically. Nevertheless, both paradigms are designed towards understanding about a particular subject area of interest and both of them have strengths and weaknesses. Thus, when combined there is a great possibility of neutralizing the flaws of one method and strengthening the benefits of the other for the better research results. (2009, p. 1)

Accordingly, combining both quantitative and qualitative methods allows for cross validation and enhanced the validity of the conclusions resulting from this study.

While both methodologies were utilized for this study, there was an emphasis upon quantitative data. Quantitative data aided in proving statistically significant relationships between an individual's acceptance of land conservation sites and the factors influencing that

acceptance or disapproval. This quantitative research aided in generalizing the factors influencing Boulder residents and explains the phenomena regarding the acceptance of land conservation. Kareiva and Marvier (2015) state, "The ability to think critically about quantitative data is one of the most important skills for conservation scientists to acquire" (p. 15). Quantitative data contributed to a descriptive study that will established associations between variables: the factors influencing Boulder residents and their acceptance of land conservation.

Qualitative data was also gathered through the survey and assisted in gaining a deeper understanding of Boulder residents' perspectives regarding land conservation initiatives. Baxter and Jack have categorized qualitative approaches as "a valuable method for science research to develop theory, evaluate programs, and develop interventions" (2008, p. 544). This method ensured a variety of lenses were utilized to explore the phenomena correlating with conservation acceptance, necessary for the objective of this study. The qualitative aspect allowed the study to represent the phenomena of the perceptions of conservation projects in the context of the real-life circumstances in which it occurred (Baxter and Jack, 2008, p. 544). Qualitative data enhanced this study by providing insight into the beliefs and values the Boulder residents have and how those beliefs underlie their behaviors and motivations towards land conservation.

A descriptive study utilizing both quantitative and qualitative data allowed for statistical relationships to be established regarding Boulder residents' demographics and lifestyles and how those influence their acceptance of land conservation. Utilizing both study methods was important, not only to determine significant relationships which drive individuals' acceptance of land conservation, but also to capture their feelings and motivations which underlie those attitudes and behaviors.

Sample

For this study the sample population consisted of City of Boulder residents over the age of 18 years. This sample was relevant to the study because they are the individuals most able to influence government officials and non-profit organizations regarding land conservation initiatives. A sample size of 100 individuals was utilized to ensure that a comprehensive collection of Boulder residents was represented. The survey was administered through random sampling to ensure diversity throughout the study population. The various groups of Boulder residents targeted for this study were students, working professionals, middle-aged residents, and retired community members. Targeting these various sample populations was accomplished by choosing various locations around Boulder. Multiple diverse locations were chosen to ensure diversity in the groups of individuals sampled; these locations safeguarded against a systematic error. The entire population of Boulder was, of course, not sampled for this study, but utilizing a diverse sample population will aid in extending the implications of study beyond those who participated.

The Survey

The survey was composed of two components: a consent form and 20 questions. Before answering any of the questions, the participants were required to read and sign the consent form to ensure they understood the process and purpose of the questionnaire. Upon any hesitation to sign the consent form, I respected their reservations and did not proceed with the questionnaire. All signed consent forms were saved to adhere to the requirements established by the University of Colorado, Boulder's Institutional Review Board. Confidentiality of all respondents' participation in the survey and their specific responses to the questions was carefully maintained

to ensure privacy. None of the participants' individual information or responses will be released for any reason, and no identification was retained on the Qualtrics database.

Once consent and confidentiality were conformed, the participant could proceed with answering the questionnaire. The first two questions were optional and asked the participants their name and email address. This information will be confidentially saved (separate from the survey responses) and will be used to send the participants the results of the study upon its completion. Most of the questions had a multiple-choice format, which ensured all answers were on the same scale and allowed for the responses to be readily analyzed. These questions gauged and analyzed the factors which influenced the participant's possible acceptance of land conservation projects. In addition, there were two fill-in-the-blank questions. The first fill-in-the-blank question was used for the qualitative component of the study, while the last question was not utilized in the statistical analysis but allowed for additional commentary from the participants regarding their perception of land conservation initiatives.

The survey began with basic questions to gain a better understanding of the demographics of the participant. These questions asked for information regarding age, ethnicity, highest education level, occupation, salary, and how long he or she had been a Boulder resident. These beginning questions were imperative in acquiring background regarding each survey participant. The following questions analyzed the participant's usage and understanding of land conservation sites. The final three questions pinpointed the level of acceptance the participants had regarding land conservation initiatives, why they were in favor of land conservation, and how they supported land conservation initiatives. Three questions were utilized instead of just one to ensure that the participants were consistent with their responses and to reach a

comprehensive conclusion regarding their degree of acceptance. All survey questions can be found in Appendix A.

Survey Locations

The surveys were conducted during fall 2017 in the City of Boulder. All surveys were conducted in-person, outside, and on public property. There was no prescreening for this study, and the only recruitment method utilized to obtain participants was asking individuals if they would like to assist in the study. All participation was voluntary at a location the individual had already chosen to go to, this avoided any undue influence or coercion. The collection of the survey responses was done during various times of the day to ensure that a comprehensive representation of the community was questioned. In addition, surveying occurred at multiple locations to ensure a diverse population sample was used, (see Figure 3).

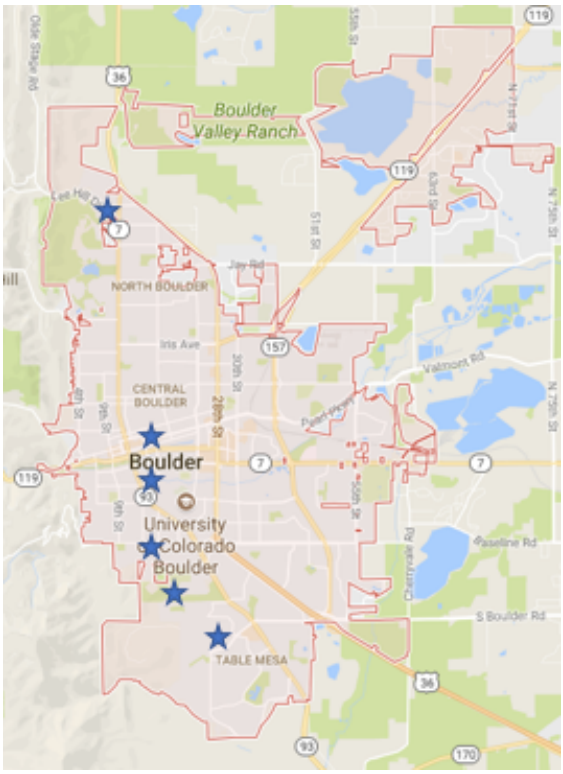


Figure 3: Sampling Locations throughout Boulder Colorado. The red line indicates the city boarder, while the blue stars indicate the sampling locations.

This variation in time and location allowed for a more representative and comprehensive sector of the population to be questioned. Surveys were conducted in equal numbers throughout the locations to ensure no bias per one demographic.

These locations were representative of commercial centers, business hubs, and park/outdoor areas. The first location sampled was the King Soopers on the corner of Table Mesa

Drive and South Broadway Street. This location was chosen because it is a common place for Boulder residents to run errands, and the location receives a large volume of traffic daily. The second location sampled was Central Park on the corner of Canyon Boulevard and Broadway Street. This location was chosen because it is a common spot for recreational and leisure activities. Another location where sampling occurred was on Pearl Street. Pearl Street attracts a diverse population base of working professionals and other residents. A fourth location sampled was along the entrance to Chautauqua Park. Chautauqua Park serves as the head of multiple trails and attracts an active population base. Sampling was also done on the University of Colorado, Boulder campus. The CU campus attracts a diverse group of students, professors, and staff. The last location sampled was the RTD bus stop at Front Range and Broadway. This bus stop is in North Boulder and gathers a diverse range of Boulder residents. These locations were chosen to represent different geographic regions of the city—South Boulder, North Boulder, Central Boulder, business centers, outdoor leisure locations, and commercial centers. Through these locations a diverse range of Boulder residents was sampled, allowing for a valid representation of the larger city population.

Variables

Numerous variables were utilized in this study to gauge what factors influence Boulder residents' acceptance of land conservation. Two sets of dependent variables were utilized for this study. The main dependent variables were the respondent's acceptance— "yes", "no", or "maybe"—of land conservation sites and why he or she was accepting of land conservation. Another dependent variable utilized looked at how the respondents support the land conservation sites. This variable determined whether there was a statistically significant relationship among the various purposes of land conservation and the individual's demographic characteristics.

These three dependent variables were utilized throughout the study to determine the various factors impacting acceptance and reasons for acceptance of land conservation sites. The following independent variables were utilized to determine what factors influence individuals' acceptance of land conservation initiatives: age, number of years as a Boulder resident, ethnicity, occupation, highest education level, salary, political affiliation, types of land conservation sites were visited, how often land conservation sites are visited, and activities for which those sites were used. All the variables utilized for this study were categorical; therefore, a chi square test was determined to be the optimal statistical method for analyzing the data quantitatively.

Statistical Analysis

Once the survey data were accumulated, the results were processed and analyzed through the Qualtrics survey software. Qualtrics served as the primary mode for the statistical analysis and for determining relationships among the factors influencing respondents. Because all the surveys were conducted in person, individual responses were accurately transferred into the Qualtrics software. Multiple comparative analyses were conducted across questions to determine statistical significance and analyze their influence and impact upon individuals' acceptance of conservation initiatives.

Numerous chi square tests were run to determine how these various independent variables influence the dependent variables. Chi square tests determine if the variables are dependent upon one another and if there is a statistically significant relationship between the variables. Each of the questions regarding demographics and visitation served as a variable to be analyzed against the conservation acceptance and support variables. This allowed each possible factor to be individually assessed to determine whether there was a statistical association among the factors' influence upon an individual's acceptance level. In addition, the demographic

questions were utilized as indicator variables. These indicator variables served to represent subgroups of my sample and determined whether these demographic categories were of any influence upon an individual's acceptance of conservation efforts. Similarly, the questions regarding an individual's visitation of land conservation sites served to determine whether usage influenced an individual's acceptance of land conservation.

The Qualtrics software calculated the p-value for each analysis. These calculations were imperative in determining the statistical significance of the results and how the variables were related. The p-value was utilized to determine the significance level of each chi square test and determine if the variables were statistically significant. For this study, the significance level of 5% was used. Therefore, when the p-value was less than 0.05, I determined the relationship to be statistically significant with a 95% confidence level. The Microsoft Excel application and the statistical program R were utilized to create all graph and tables. The combination of chi square tests and graphic analysis ensured that my study provides insight into causal relationships. In order to produce viable results, I wanted to ensure that the relationships are causal, that various demographic and conservation site usage factors are actual causes in influencing Boulder residents' acceptance of conservation initiatives.

Qualitative Coding

For the qualitative aspect of this study, the Qualtrics application was utilized to code the survey respondents' responses to open-answer questions. The coding was done by tagging the vocabulary and concepts that reappear throughout numerous responses, allowing me to compile and categorize those responses. Through tagging the vocabulary and concepts, I was able to assign specific codes to the responses. For this study, a combination of pre-set and open coding was utilized. To begin with, the pre-set codes were human interference, preservation, and

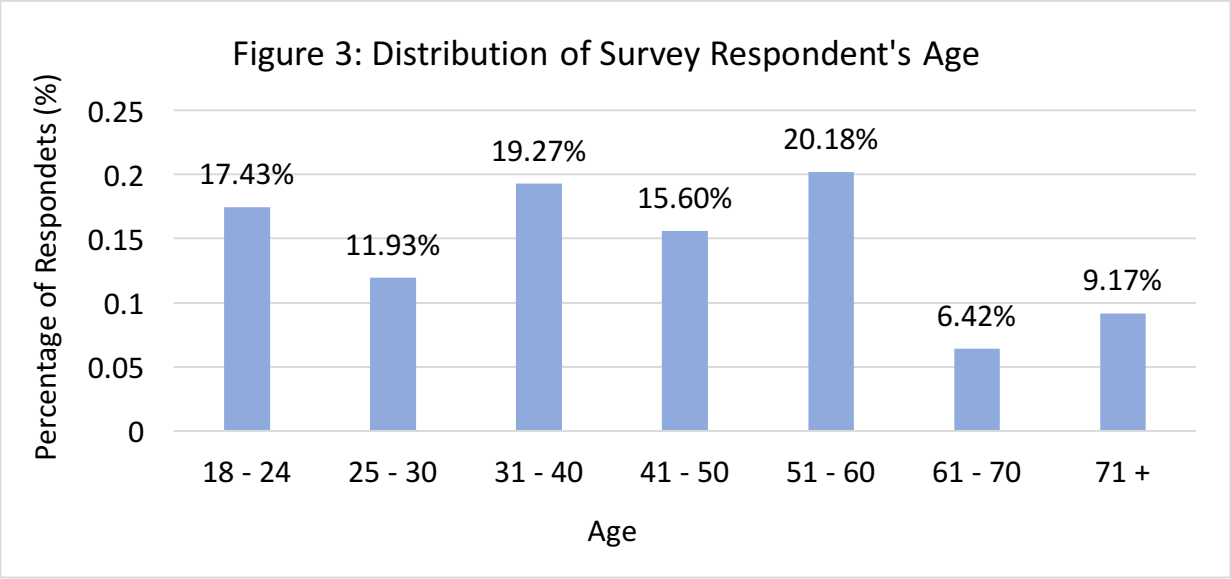
development. As I continued qualitatively analyzing the results, additional codes were added through open coding.

Results

One hundred eight Boulder residents responded to the survey, representing about 0.1% of the Boulder City population (Boulder's population was last assessed in 2016 to have 108,090 living within the city limit). Originally, 112 surveys were collected, but 4 were eliminated from the study due to not being complete. In addition, some of the survey questions allowed for multiple responses to be chosen. Consequently, some of the responses will have more than a total of 108 answers, due to respondents picking two or more responses for each question.

Data Overview

The purpose of the Data Overview sub-section is to gain insight into the data collected from survey respondents. The following variables are described below: age, political affiliation, highest education level, salary, previous residence, length of time as Boulder resident, types of



land conservation visited, acceptance of land conservation, types of support for land

conservation, how respondents support land conservation, and how often respondents visit land conservation.

Figure 3 demonstrates the distribution of the respondents' age. The variable age had 7 different categories with each category covering between 5 – 9 years, apart from the last category 71+. Each category composed a minimum of about 6% of total data and a maximum of about 21% of the total results. The 51 – 60 years category contained the most respondents, while the 61 – 70 years category had the least.

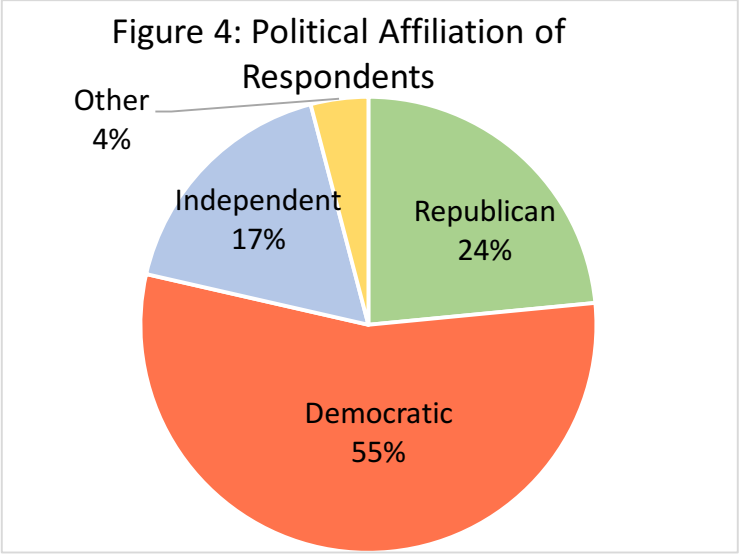


Figure 4 displays the distribution of respondents' political affiliation. The variable political affiliation has four categories: Democratic, Republican, Independent, and other. The democratic category had the most respondents and encompasses 55% of the data. In contrast, the "other" category contains only 4% of the data.

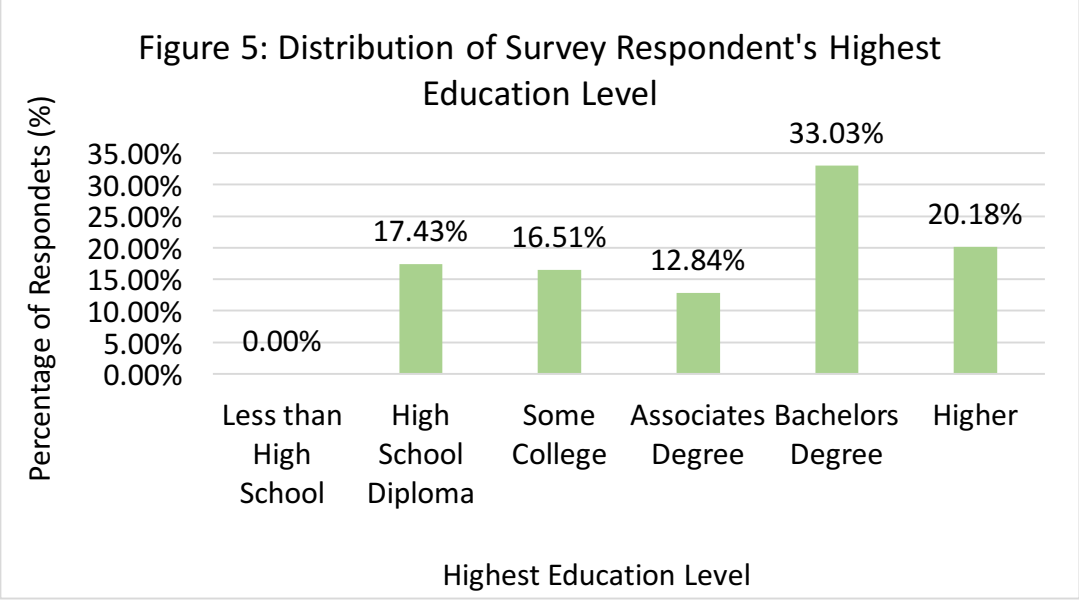


Figure 5 displays the respondents' highest education level. This variable has six categories, but "less then a high school diploma" received zero responses. The highest education level with the most respondents was "Bachelors degree", while the category with the least respondents, but at least one, was "Associates degree".

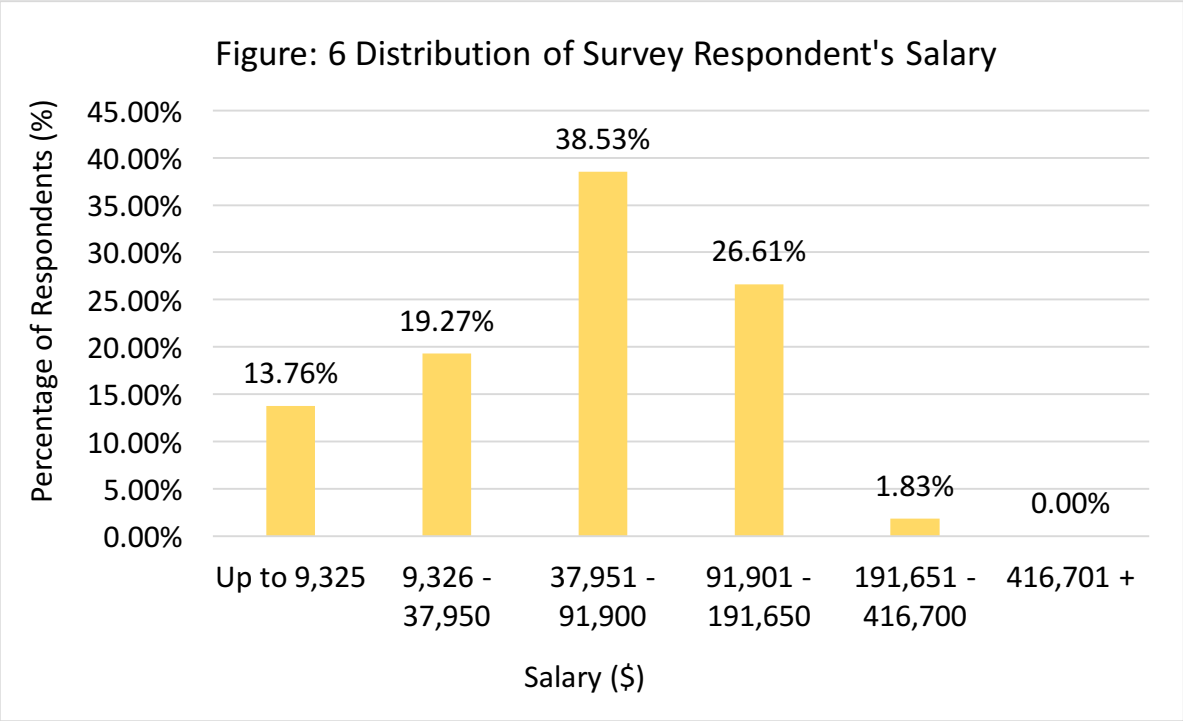
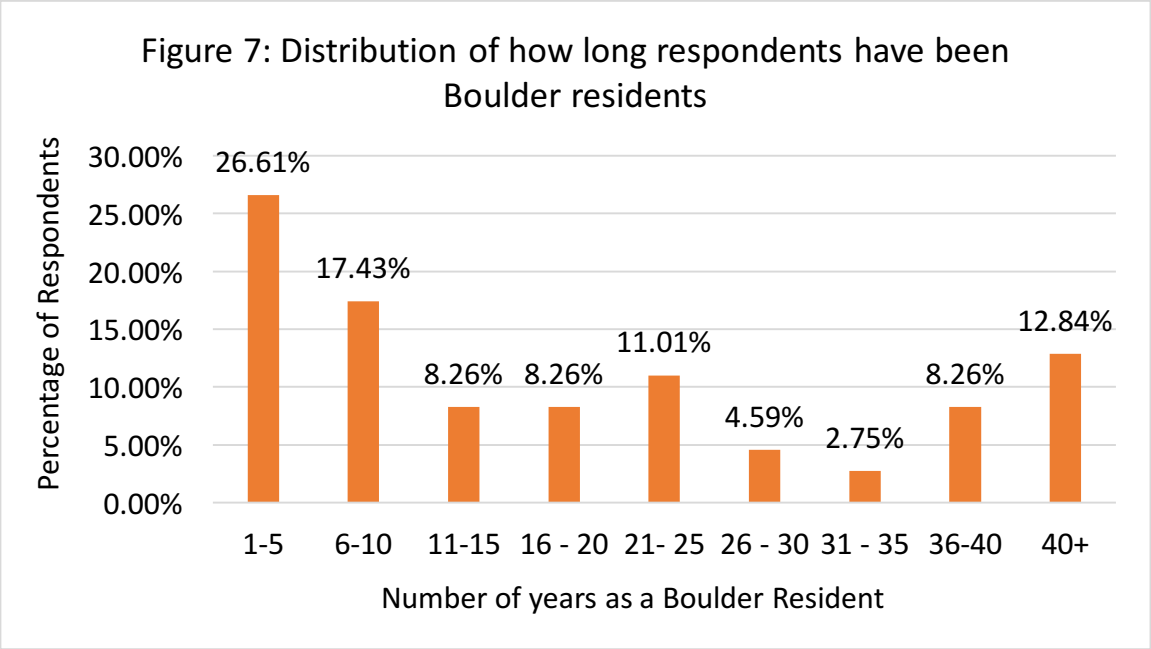


Figure 6 categorizes the 108 respondents by their annual indivdual salary bracket. The five brackets indicated on the survey correspond the United States Internal Revenue Service's single income tax bracket. The $37,951 - $91,900 bracket was the largest salary category with 38.53% of respondents. The least amount of respondents had a salary of $191,651 - $416,701, representing 1.83% of the data. No respondents declared a salary over $416,701.



The bar graph above, Figure 7, displays how long respondents have been citizens of Boulder. This variable has 9 categories, each spanning 5 years, with exception of the last category 40+. The category indicating 1-5 years had the most respondents containing 26.62% of the data. In contrast, the 31 – 35 category had the lease amount of data with 2.75%.

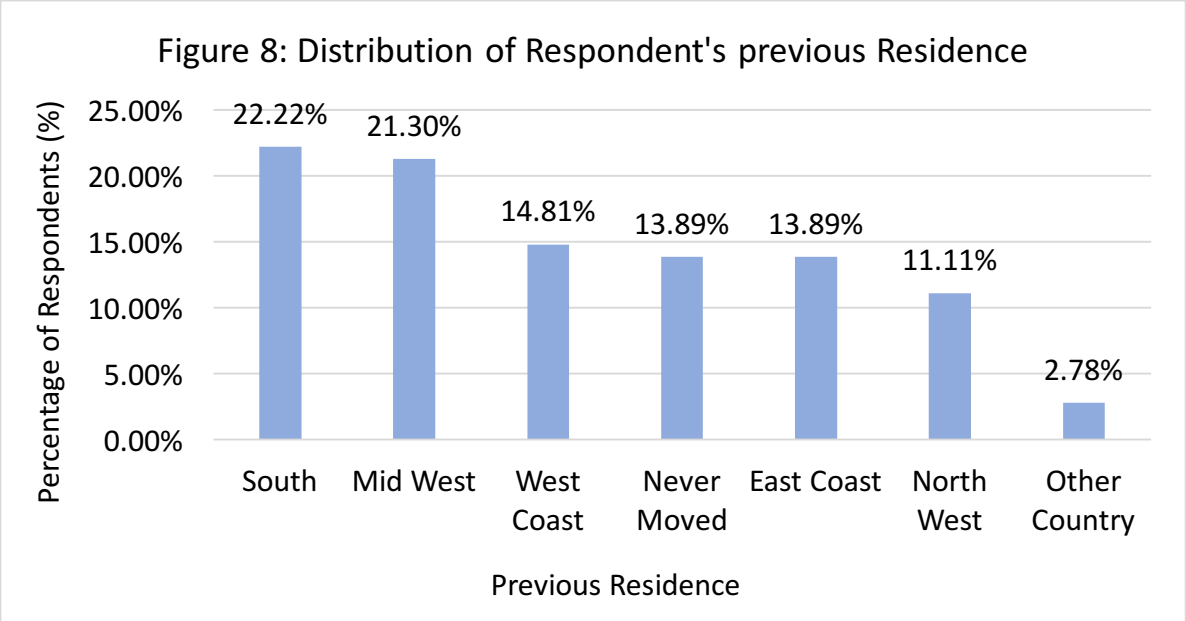


Figure 8 displays the distribution of survey respondent's previous residency prior to living in Boulder. This variable seperates the United States into 6 different geographical regions,

and has one category for other country. The data results indicate that the South was the largest category for respondent's previous residency with containg 22.22% of respondents. In contrast, other country contained the lease amount of respondents with only encompassing 2.78% of the total data.

Table 1 displays the distribution of survey respondents' ethnicity. This variable had 10 different categories. The category "other" incldued the following ethnicities: Chinese, English, European, Canadian, and Irish. The category with the majority of respondents was caucasian, which included 66.67% of total respondents. Korean and Indian had the least amount of respodents with each category containing 1.85% of the total responses.

Table 1: Distribution of Respondents Ethnicity

Ethnicity	Percentage of Respondents
African American	7.41%
Asian	3.70%
Caucasian	66.67%
Hispanic	8.33%
Indian	1.85%
Korean	1.85%
Middle Eastern	2.78%
Native American	2.78%
Other	4.63%

Figure 9 : Percentage of Respondents who visit Land Conservation Sites

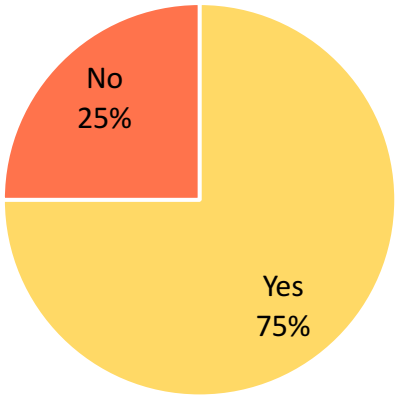


Figure 9 demonstrates the breakdown of respondents who visit land conservation sites. Within the 108 survey respondents, 75% affirmed that they do visit land conservation sites, while 25% responded that they do not visit the sites.

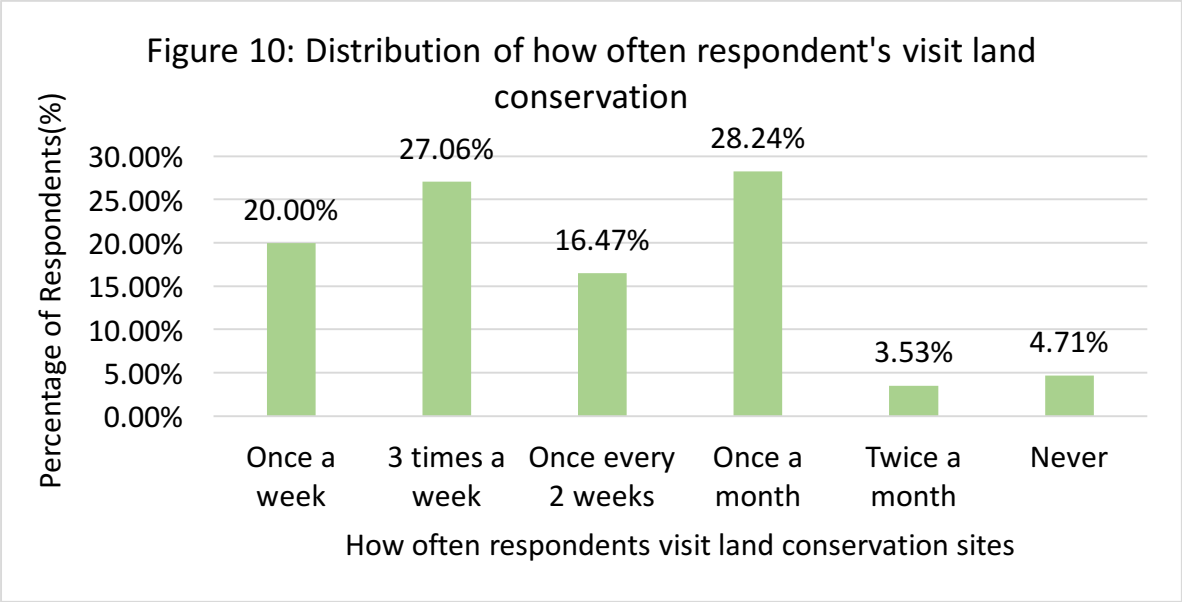


Figure 10 visually demonstrates how often the survey respondents visited land conservation sites. Once a month and three times a week had similar results and had the highest results for how often respondents visited land conservation sites; respectively these categories contained 28.24% and 27.06% of respondents. Twice a month received the least amount of responses with only 3.53% of the total data.

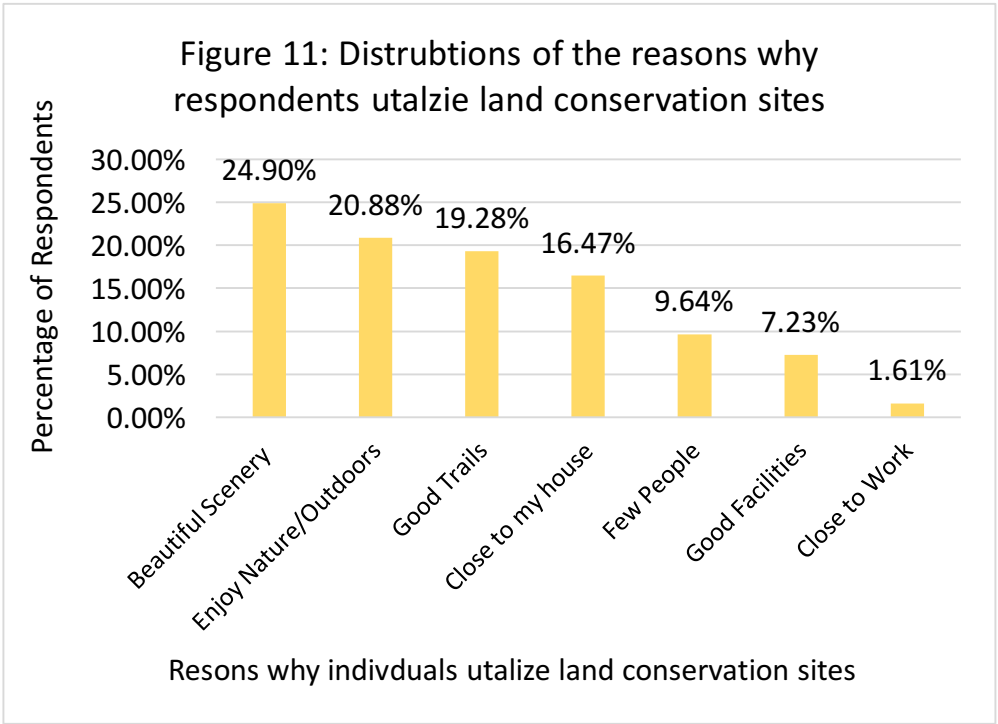
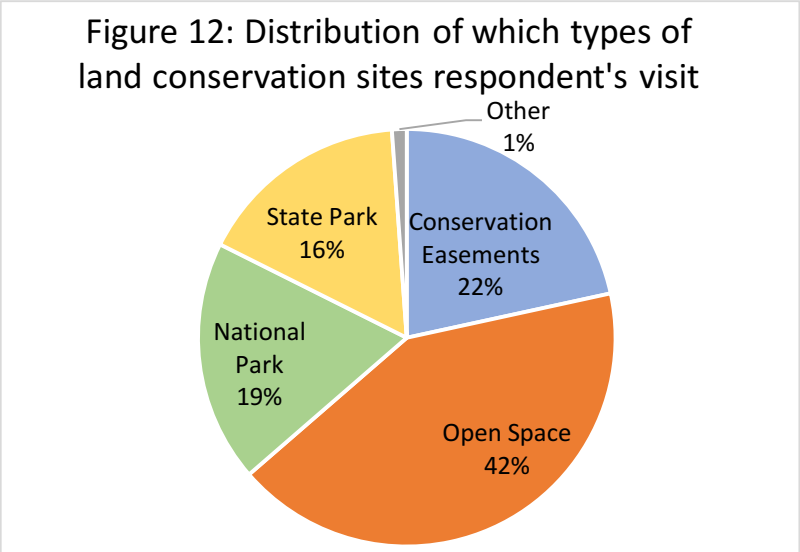


Figure 11 depicts the distribution of respondents' responses when asked why they utilize conservation sites. Due to allowing respondents to choose more than one answer, this survey question

had a total of 249 responses. Beautiful scenery had the most responses and contained 24.90% of the data. In comparison, close to work received the least amount of responses and contained only 1.61% of the data.

Figure 12 shows the breakdown of what type of land conservation the survey respondents visit. This survey question allowed multiple responses; therefore, the total number of responses was 176. The category with the most responses was Open Space containing 42% of the total data, while "other" only received 2 responses and contained 1% of the data.



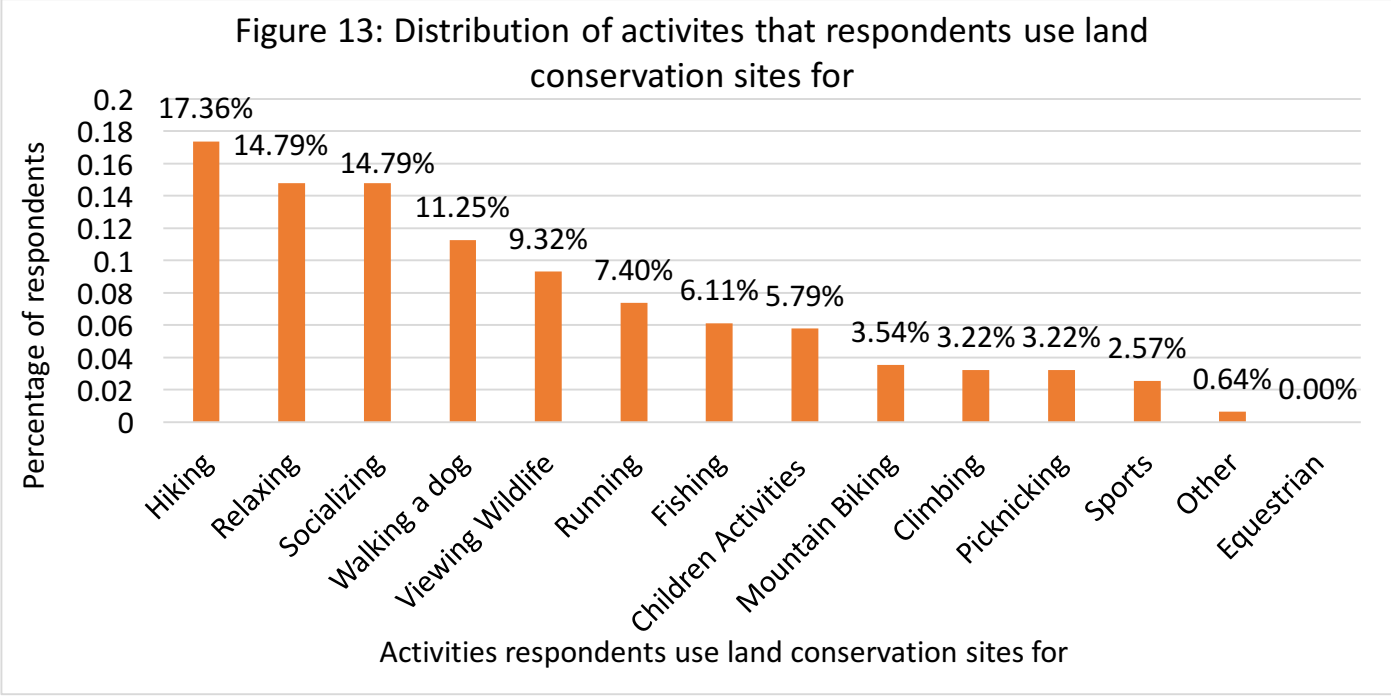


Figure 13 displays the distribution of activities that respondents participate in at land conservation sites. This survey question allowed respondents to choose multiple answers and received a total of 311 responses. There was only one activity that received no responses: equestrian. In contrast, hiking received the most responses and contains 17.36% of the total data. The category which had the least amount of responses, but at least one, was "other" with .64%.

Figure 14: Distribution of respondents acceptance of land conservation sites

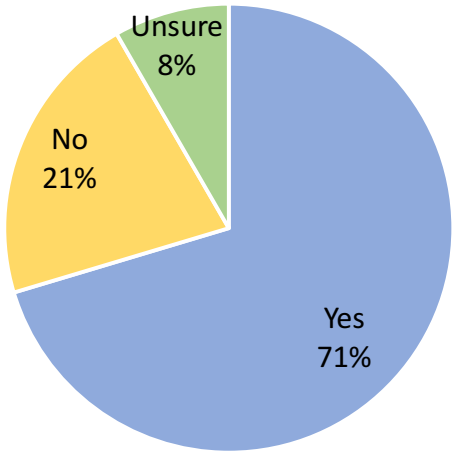
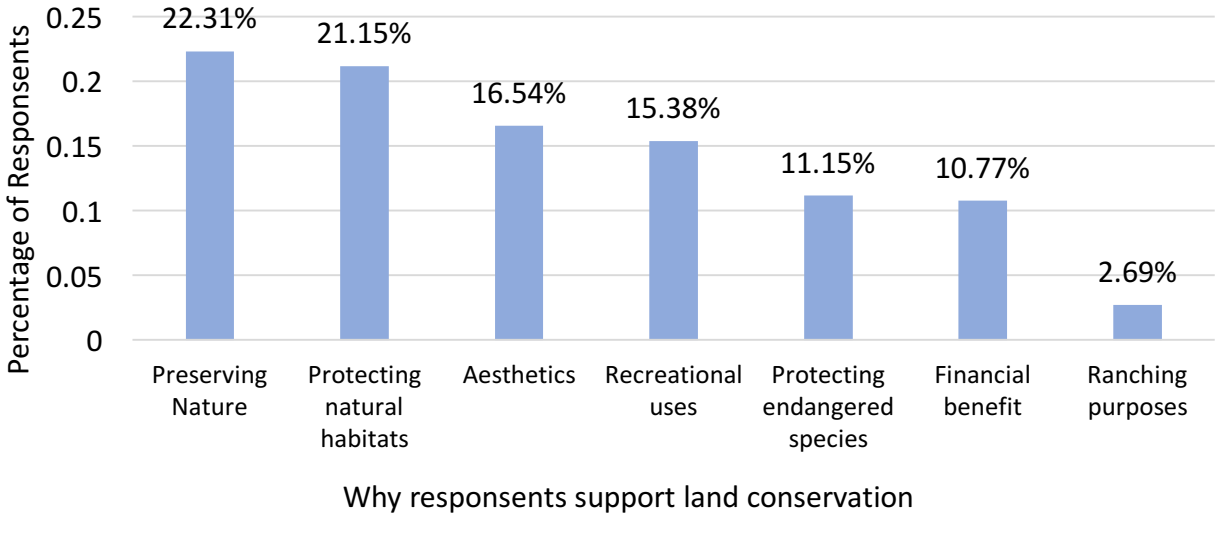


Figure 14 demonstrates the respondents' acceptance of land conservation. This survey questions had three responses, Yes, No, or unsure. The yes category received 71% of the data, and was concluded as the largest category for this survey question. Unsure had the smallest amount of responses and only accounted for 8% of the responses.

Figure 15: Reasons why respondents support Land Conservation



The above bar graph, Figure 15, demonstrates the reasons respondents support land conservation initiatives. Seven different categories were utilized to determine the underlying reasons why respondents support land conservation. Out of the 7 categories there was a total of 260 responses. Preserving nature has the highest response with 22.31% of the total data, while protecting natural habitats had a similar number of responses with 21.15%. The category with the least responses as to why respondents support land conservation was ranching with only accounting for 2.69% of responses.

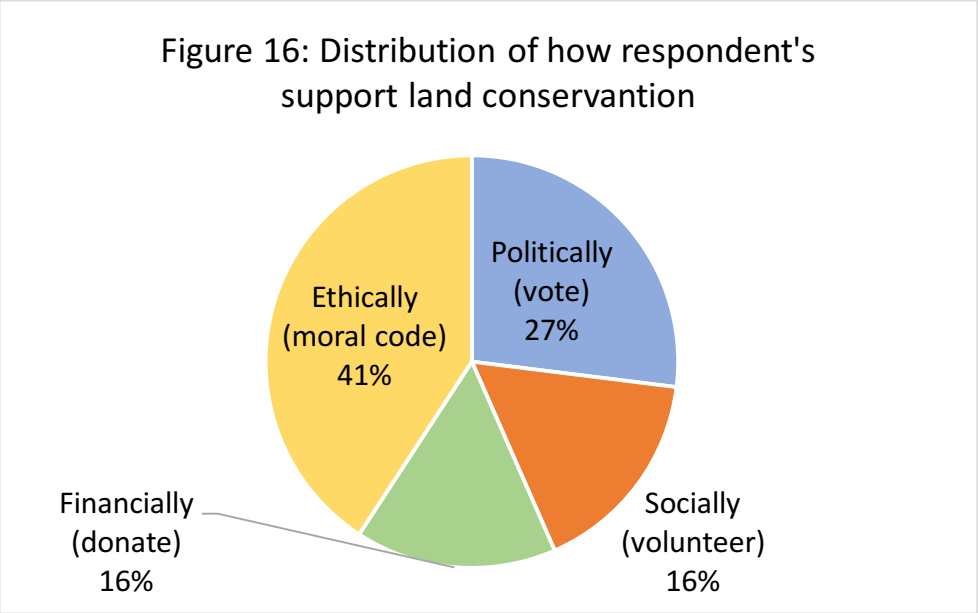


Figure 16 demonstrates the survey's conclusions to the ways in which respondents' support land conservation. For this question, participants could choose multiple responses with there being a total of 148 responses. Ethically received the most responses and accounts for 41% of the data. In contrast, financially and socially had the least responses with 16%.

Quantitative Results

The following mosaic plots demonstrate the results from the six chi square tests all resulting in statistically significant relationships. The mosaic plots provide a graphical representation of the frequency table for the two particular variables included in each figure. These graphs include multiple rectangles, where the width of the rectangles are proportional to the variable on the x-axis and the heights are proprtional to the variable on the y-axis. Through these chi sqaure tests, conclusions can be made as to which factors have an influential relationship with respondents' acceptance of land conservation. A factor was deemed influential and statistically signifcant if the p-value was equal to or below 0.05. This determines a confidence interval of 95% which means the conclusions are 95% acccurate in representing the population parameter. Through the chi square tests it is concluded that visitation frequency, salary, and political affiliation were all influential factors impacting acceptance of land conservation.

Figure 17: Distribution of if respondents support and visit land conservation sites

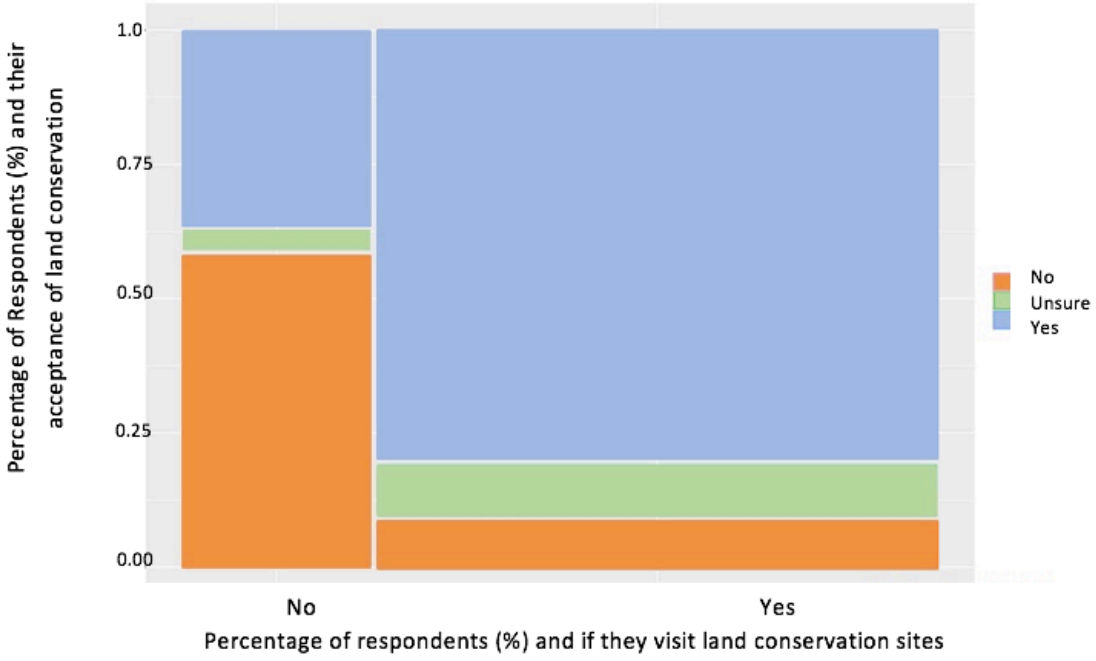


Figure 17 demonstrates the relationship between respondents' acceptance of conservation and if they visit land conservation sites. The chi square test produced a p-value of .00; therefore, we will conclude that there is a statistically significant relationship. The results of the chi square test indicate that respondents' acceptance of conservation is influenced by if they visit land conservation sites. The category of individuals who are accepting of land conservation and do visit land conservation sites represents 81% of all individuals who visit land conservation sites and 86% of those who are accepting of land conservation. The category that symbolizes individuals not accepting of land conservation and do not visit land conservation sites represents 59% of those who do not visit land conservation sites and 69% of those who are not accepting. Figure 17 demonstrates that respondents which visit land conservation sites are more likely to be accepting of land conservation then those that do not visit.

Figure 18: Distribution of is respondents are supportive and how often they visit land conservation

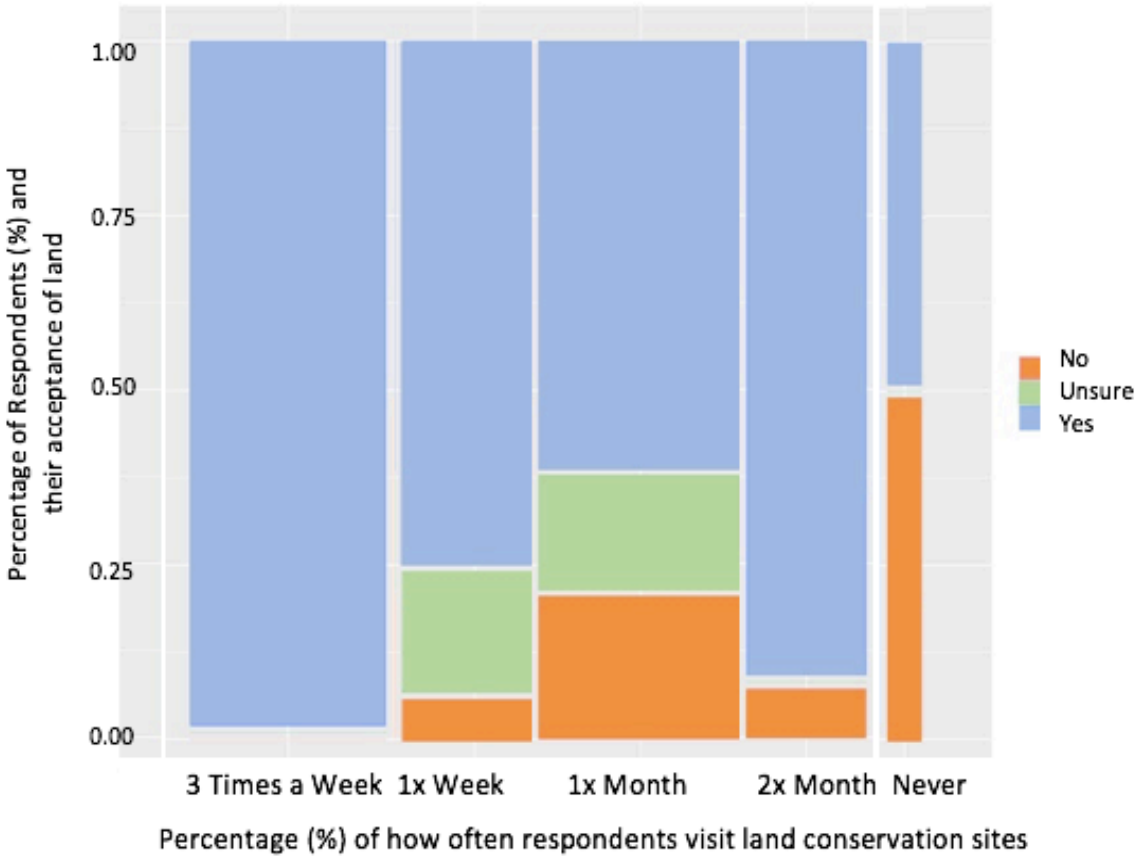
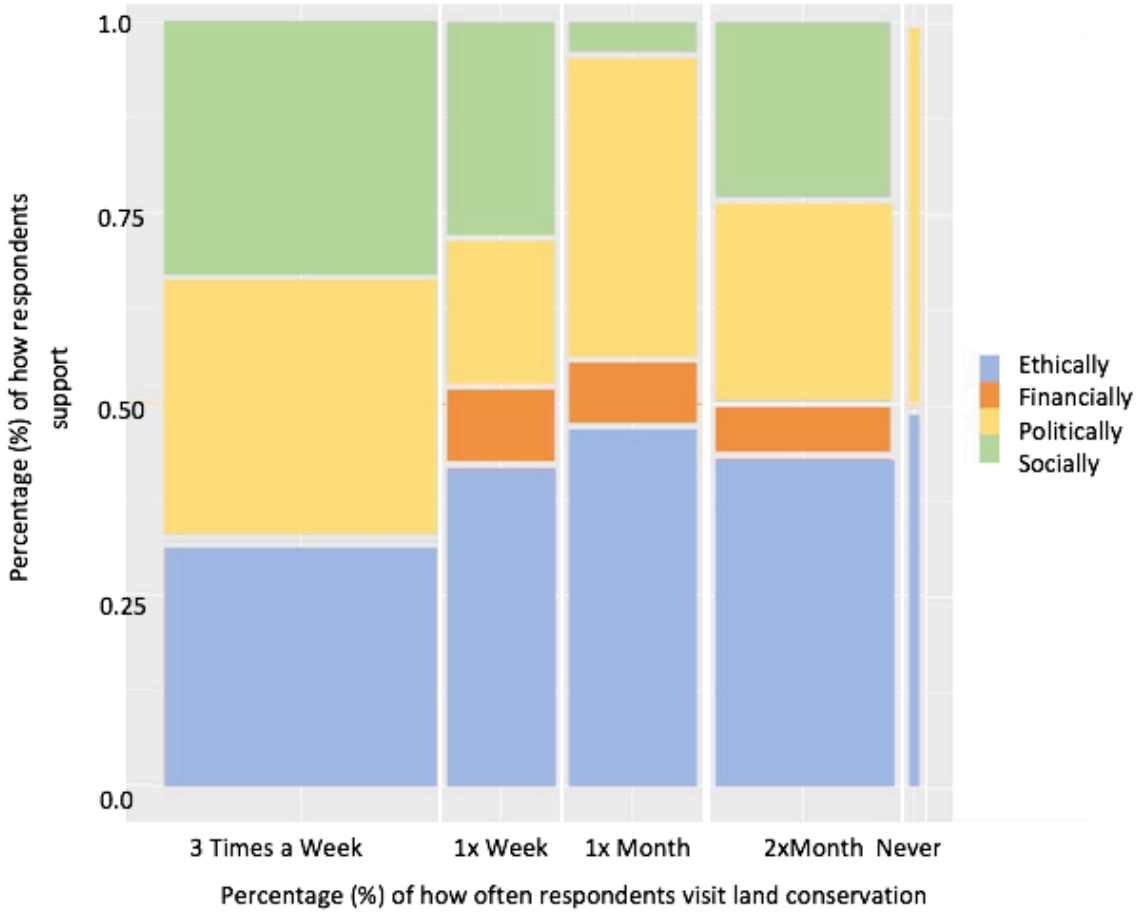


Figure 18 displays the relationship between how often respondents visit land conservation sites their acceptance of land conservation. This chi square test produced a p-value of .01, allowing us to conclude that there is a statistically significant relationship. The mosaic plot demonstrates that the more often respondents visit, the more likely they are to be accepting of land conservation. 100% of the respondents who visit land conservation sites at least 3 times a week are accepting of land conservation. In contrast, those who never visit land conservation sites have a 50% change being accepting of land conservation. Individuals who visit land conservation once a month are 62% accepting of land conservation and 20% not accepting. Figure 18 demonstrates that the more often a resident visits land conservation the more accepting they are.

Figure 19: Distribution between how respondent's support and how often they visit land conservation



The figure above (Figure 19) demonstrates the relationship between how often the respondent's visit land conservation sites and how they support land conservation initiatives. The chi square test for this relationship produced a p-value of .01, and allows us to conclude that there is a statistically significant relationship. Figure 19 allows us to determine that the more respondent's visit land conservation sites influences how they support land conservation initiatives.

Figure 20: Distribution of why respondents are accepting of land conservation and their salary

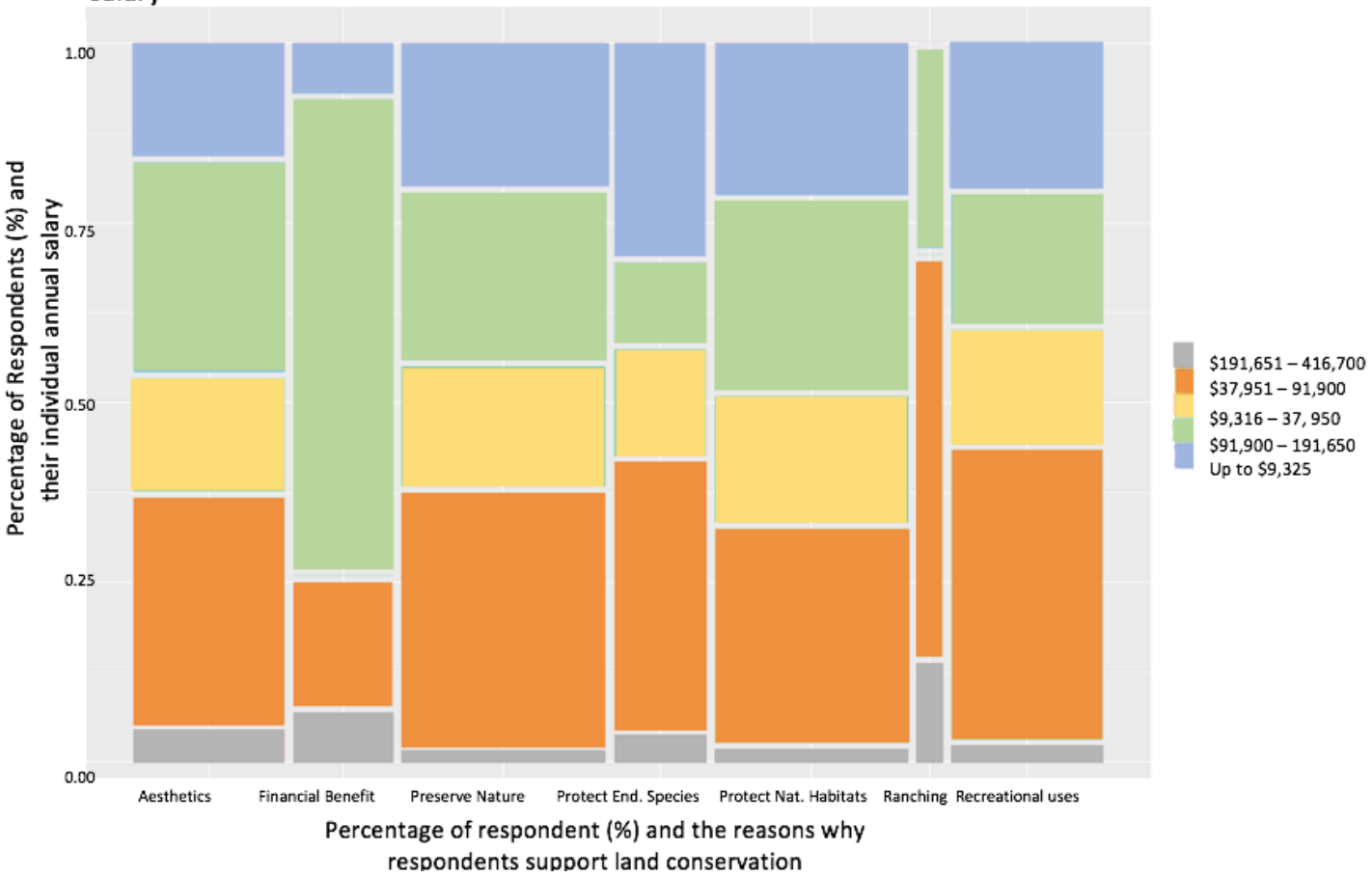


Figure 20 demonstrates the relationship between respondents' salary and they reason why they support land conservation. The relationship between these two variables was concluded to be statistically significant due to the p-value being .04. The major outcome from this chi square

test is that 67% out of all respondents accepting of land conservation for financial benefit are within the $91,901 – $191, 650 salary range. Another substantial finding, is that is that 44% of respondents accepting of conservation for the protection of endangered species have salaries within the $37,951 – $91,900 range. In addition, the same salary range encompassed 36% of the respondents who are accepting of land conservation for preserving nature and 45% of the respondents who are accepting of land conservation for recreational usage. Therefore, a respondent's salary influences the reasons why they support land conservation.

Figure 21: Distribution of how respondents support land conservation and their salary

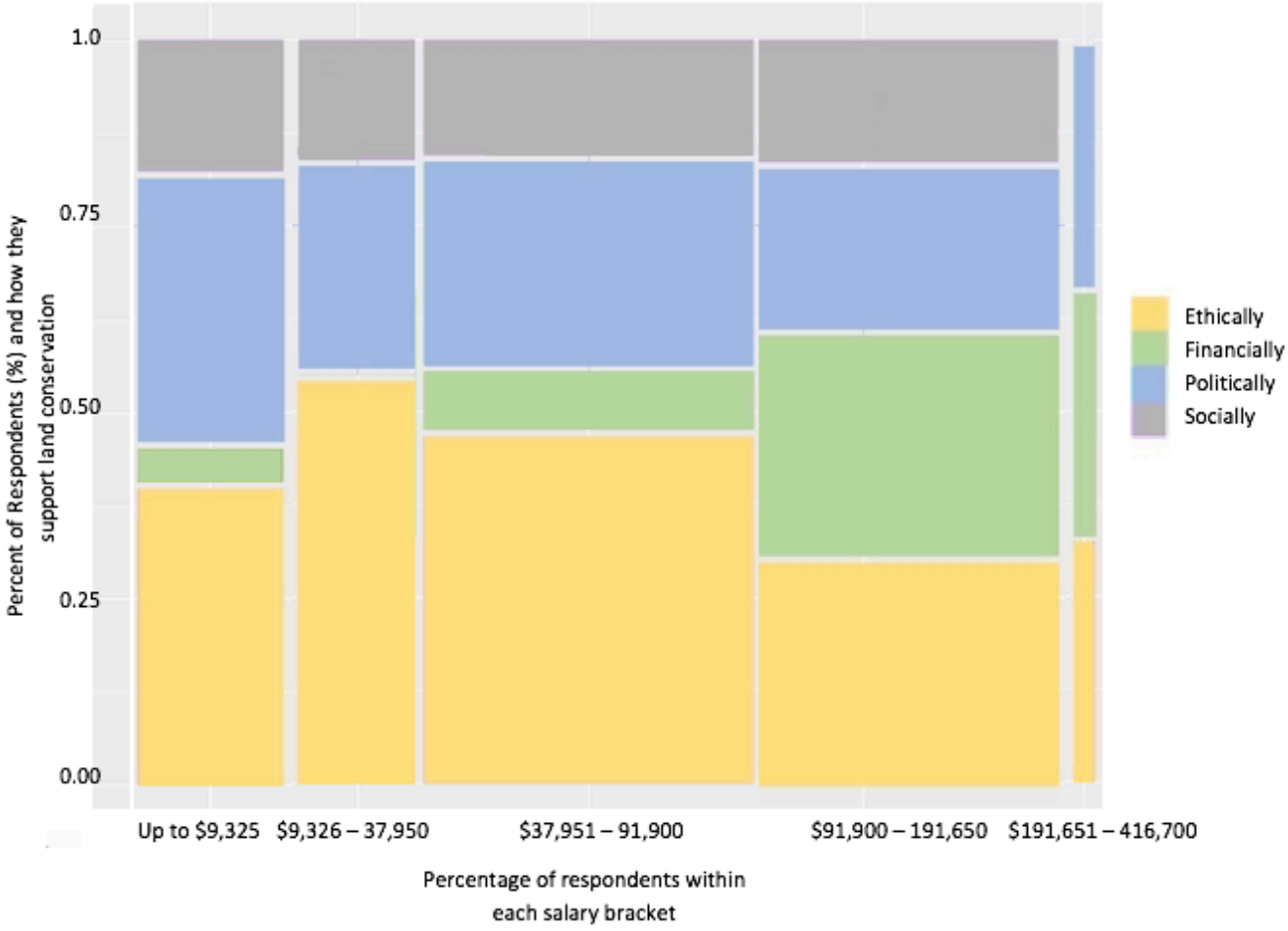


Figure 21 displays the relationship between salary and how the respondents support land conservation. This chi square test for this relationship produced a p-value of .03. Therefore, we

will conclude that the relationship is statistically significant. Individuals within the 0-$9,325 salary range are most likely to be ethically supportive of land conservation, encompassing 41% of their overall acceptance, and individuals within the $37,951 - $91,900 range follow the same trend encompassing 92% of their overall acceptance. Additionally, respondents in the $91,901 – 191,650 range are most accepting of land conservation for financial reasons and encompass 72% of the overall financial support. All the salary brackets, including the lowest salary category, indicated some level of financial support for land conservation with exception of the $9,326 - $37,950 category. Finally, supporting land conservation through social channels is consistent among all salaries.

Figure 22: Distribution of respondent's acceptance of land conservation and their political affiliation

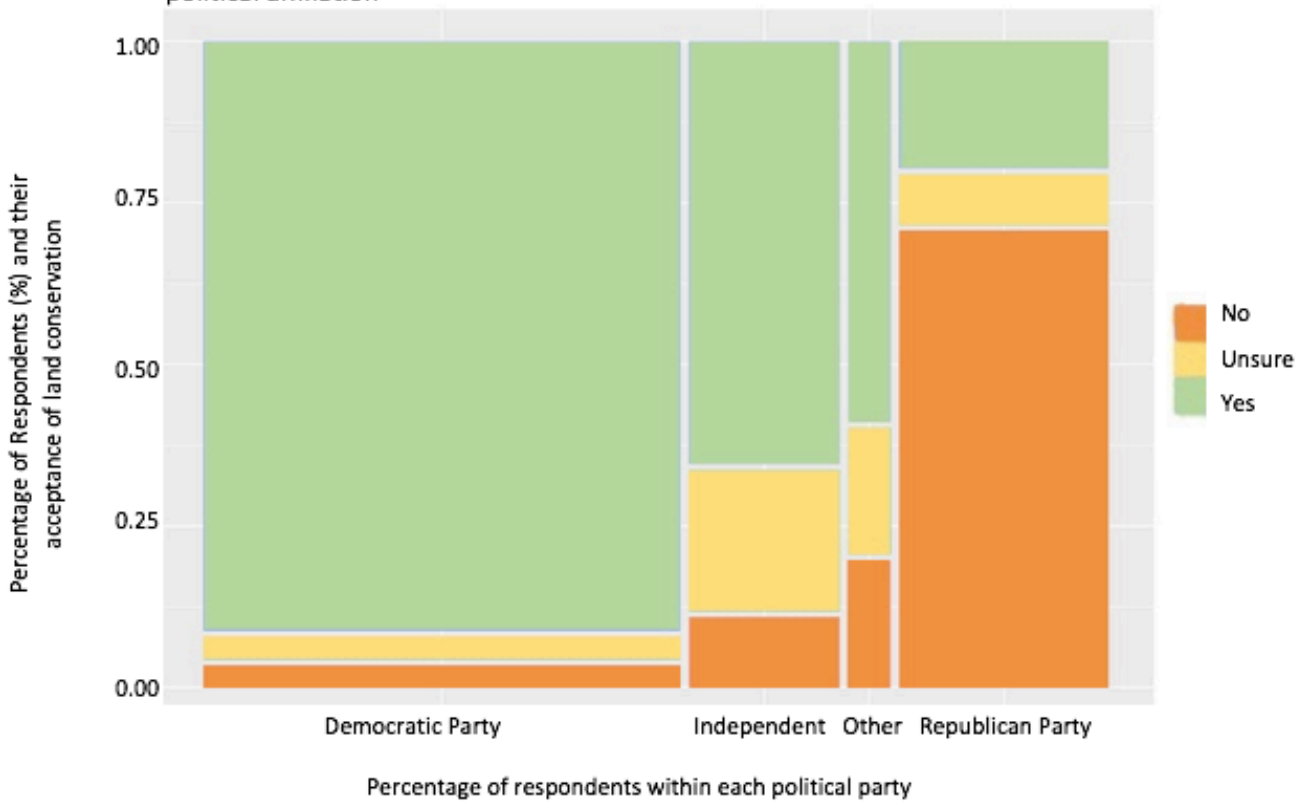


Figure 22 demonstrates the final chi square test which represents the relationship between respondents' acceptance of land conservation and their political affiliation. This chi square test produced a p-value of .00. Therefore, we can conclude that the relationship is statistically

significant within a 99.998% confidence level. From Figure 21 we can determine that respondents that classify themselves within the Democratic or Independent political parties are more accepting of land conservation. Individuals who classify themselves as Democrats make-up 72% of the overall respondents who are accepting of land conservation, while Independents make-up 17%, and Republicans make-up 6%. In contrast, the mosaic plot demonstrates that Republicans are less accepting of land conservation, with encompassing 78% of overall respondents who are not accepting of land conservation. The chi square test displayed in Figure 22 demonstrates that respondent's political affiliation plays an influential role in their acceptance of land conservation.

Qualitative Results

For the qualitative aspect of this study all completed surveys were coded regarding the respondents' answers to question 13 and the last optional question: "Please write a definition of land conservation" and "Please provide any additional comments or information". Question 13 was a fill-in-the-blank, in which respondents were asked, with no previous prompting, to write a definition of land conservation. The surveys were coded to distinguish which vocabulary was used the most by respondents when defining land conservation. The results of the qualitative study distinguish three words as being primarily used by respondents. The first word, which was utilized 38 times or 35% of all definitions, was "preserve". The second vocabulary word used frequently by respondents was "development" with was stated in 13 responses or 12% of the total definitions. The final vocabulary world used predominantly through the land conservation definitions was "aesthetics". These three words ("preserve", "development", and "aesthetics") are significant for understanding Boulder residents background regarding land conservation.

A similar aspect to almost all responses was the emphasis on maintaining nature or natural land. These definitions focused on land conservation as a tool for upholding the integrity of these lands through eliminating human alteration. The definitions provided by survey respondents perceived land conservation as a method to preserve land, with limited human development, for the future. A variety of responses focused on the idea that land conservation eliminates or reduces human influence. The word "natural" was another common theme. This commonality provides insight that the survey respondents view land conservation's purpose to keep ("preserve") these spaces in their original, unaltered state. The qualitative results provided insight into the context and beliefs respondents have regarding land conservation.

The last question, which was optional, was formatted as a fill in the blank question. This allowed respondents to provide any additional information or comments regarding the survey and land conservation. Only two respondents provided a response for this question and their insight is very valuable. The first anonymous response stated, "Land conservation has halted development and raised property prices. This has caused implications for the city and we need to focus on increased development to allow Boulder to grow." This response was from an older, Caucasian individual who identifies as a Republican and has lived in Boulder for over 40 years. The responses to other survey questions demonstrate that he or she visits land conservation sites once a month, but is not supportive of land conservation initiatives. The second anonymous respondent stated, "Money instead needs to be invested into development." This response was provided by an individual who is a Republican between the ages of 25 and 30 and has lived in Boulder for about 16 to 20 years. In resemblance to the previous response, this individual also visits land conservation sites once a month and is not supportive of land conservation initiatives.

These responses have similar topics and concerns and demonstrate how the lack of new development and growth of Boulder is a concern.

One irregularity from the qualitative aspect of this study was the lack of emphasis in the definitions or comments regarding recreational or human use of land conservation sites. No respondents included recreation in their definitions despite the large emphasis of use and support for these areas because of the recreational benefit, evident through the other survey questions. The only regard to humans in the qualitative data was related to eliminating their influence or impact; there was no consideration of land conservation sites for human benefit. This observation from the qualitative analysis was unexpected due to the other survey questions demonstrating the emphasis of respondents' support and acceptance of land conservation for human use and benefit. Therefore, this qualitative analysis can conclude that there is a disconnect between why respondents use land conservation sites and what they believe the purpose of land conservation is. The results from the qualitative analysis allow me to conclude that land conservation initiatives would benefit by emphasizing the preservation of nature and aesthetics of the land. Additionally, limiting development is also commonly associated with land conservation, but due to the controversy regarding the impact of land conservation on development projects and commercial land values, promotion of this approach may not always be advisable. Boulder is unique in that its land conservation sites contain spectacular scenery; other communities should be cautious that an over emphasis on aesthetics might disqualify some less "beautiful" places from widespread acceptance of conservation efforts.

Discussion

Through both quantitative and qualitative analysis this study concluded that how often respondents visited sites, their salary level, and their political affiliation are the main factors that

influence Boulder residents' acceptance of land conservation. The survey participants comprised an accurate representation of the Boulder community because they closely resembled the demographics of the overall City of Boulder population. Understanding the influence of these three factors is crucial to protecting land and understanding the community's determination for conservation. A Boulder resident's salary, political affiliation, and how often he or she visited land conservation sites was determined to have a significant influence upon acceptance of land conservation, contingent upon the statistically significant results. These variables conveyed important information regarding who has access to natural environments, the role of power and affluence, and what motivations promote the creation of these land conservation sites. Through exploring environmental privilege, experience of nature, and progressive, environmentally centered attitudes, this study explored the underlying factors influencing land conservation initiatives.

Survey Results Compared to Boulder Demographics

The purpose of the survey was to utilize a sample of Boulder residents to represent the larger overall population. Before I discuss the results of the study, I needed to ensure that the sample was a sufficient representation of the Boulder community. I argue that the sample of 108 Boulder residents is a representative demographic and produced descriptive statistics like that of the entire city. The data collected in this study's survey were compared to data collected and recorded by the United States Census Bureau and Data U.S.A.

The following variables—age, ethnicity, salary, and highest education level—were used to demonstrate that the survey sample demographic is representative of the larger Boulder community. While the age categories for my survey sample and the United States Census Bureau are slightly different, I concluded that the sample utilized in this study is representative of the

City of Boulder (see Table 2). The distribution from the study sample is slightly skewed towards the older ages and less representative of the younger ages.

Table 2: Comparison of Survey and Boulder Age Demographic

Age Range	Survey Demographic	Boulder Demographic
18 – 24	17.43%	28%
25 – 30	11.93%	12%
31 – 40	19.27%	18%
41 – 50	15.6%	16%
51 – 60	20.18%	13%
61 – 70	6.42%	7%
71 +	9.17%	6%

Next, I compared the racial and ethnical composition of the study sample to the city population, (see Table 3).

Table 3: Comparison of Survey and Boulder Ethnicity Demographic

Ethnicity	Survey Demographic	Boulder Demographic
Caucasian	66.7%	82.4%
Hispanic	8.3%	8.6%
Asian	5.5%	5%
Native American	2.78%	.1%
Other	4.63%	3.9%

My distribution for salary (Table 4) is slightly skewed towards the lower salary range compared to the city. This result is most likely due to my survey including university students, who typically have smaller salaries, while the two city distributions did not include university students.

Table 4: Comparison of Survey and Boulder Salary Demographic

Salary	Survey Demographic	Boulder Demographic
Up to $9,325	13.76%	11%
$9,326 - 37,950	19.27%	17%
$37,951 – 91,900	38.53%	41%
$91,901 and above	29%	31%

The final variable that demonstrated the study sample is an accurate representation of the City of Boulder is highest education level.

Table 5: Comparison of Survey and Boulder Educational Demographic

Highest Educational Level	Survey Demographic	Boulder Demographic
High School Education	0%	3.1%
High School Diploma	17.43%	7.4%
Some College/Associates Degree	28%	11.1%
Bachelors Degree	33.03%	45%
Higher	20.18%	33.4%

Out of all the demographic variables utilized in the survey, highest educational level was least related. The survey demographic was different and less representative of the larger Boulder demographic. The survey demographic over-represented the high school diploma and some college categories and under-represented bachelor's degree and higher education levels. Overall, the sample demographic surveyed for this study resembles the City of Boulder demographic; therefore, my sample accurately portrays the city population.

Environmental Privilege

Salary was one of the most prominent factors influencing Boulder residents' acceptance of land conservation. This variable demonstrated that as salary increased, the underlying factors of why and how individuals accepted land conservation were altered. A higher salary correlated with increased support for land conservation. With salary as a main factor influencing Boulder residents' acceptance of land conservation, it became apparent that environmental privilege is present. Environmental privilege results from affluent groups of individuals, those with economic, political, or cultural power, receiving exclusive access to environmental amenities (Park, 2011, p. 4). After examining salary as a main factor influencing land conservation acceptance, I concluded that environmental privilege is clearly present in the City of Boulder.

The impact of salary upon acceptance for land conservation suggests that Boulder's land conservation sites, public spaces, might be disguised as quasi-public spaces for elite or affluent individuals. While the relationship was not statistically significant, there was a pattern between highest education level and support for land conservation. Out of the 76 respondents who were accepting of land conservation, 75% of them had a bachelor's degree or a more advanced. In comparison, out of the 23 individuals who were not accepting of land conservation, 52% of respondents had some college or a high school diploma. Information from this data, along with the results of the variable salary, demonstrated that there is clear pattern of educated, wealthier Boulder residents being the ones more likely supportive of land conservation. Environmental privilege is described as "places where nature can be manipulated for the convenience and enjoyment of a handful of elites" (Park, 2011, p. 7). This description of land conservation is consistent with the results of this study: wealthier individuals are more likely to be accepting of land conservation. The environmental movement—which has promoted land conservation—is often categorized as a white, middle-class phenomenon. Ecological and social phenomena are intertwined and must be studied in unison to fully understand the environmental movement.

Environmental privilege in Boulder is represented reflected in the fact that wealthier citizens can more easily access spaces which are protected from ecological harm. Open Space and other land conservation sites in Boulder are open access, and there are no restrictions on who may use them—with the exceptions of land conservation easements on private property or designated protected zones where no individuals are allowed. Park demonstrates in his article that the environmental movement, which is a primary advocate for land conservation, "remains a culturally exclusive cause…more often supports policies that benefit and reflect desires of the privileged groups" (2011, p. 13). For this reason, environmental privilege often goes unnoticed

because there are no physical or conscious barriers restricting some groups from using a space, but the initiatives that created those spaces were based on privileged group's agendas. Laure Pulido categorizes environmental privilege as a form of racism. Pulido explains that environmental privilege differs from a hostile, individual, discriminatory act, because it refers to the privileges and benefits that accrue to a specific group because of their status (2000). Ultimately, environmental privilege expresses the fact that some groups of citizens have access to spaces that are protected from ecological harms, harms that many are forced to live with. Through data on salary it became apparent that environmental privilege is present in Boulder, and a resident's class status may dictate his or her access to land conservation. While specific groups are not consciously excluded from the areas, the creation of land conservation sites benefits wealthier residents and in return become their places to enjoy.

Experiencing Nature

It is not a surprise that this study discovered that how often individuals visit land conservation sites had a positive correlation with their acceptance of land conservation. The frequency of visiting land conservation sites was one of the major factors influencing and enhancing Boulder residents' acceptance of land conservation. This relationship was clear due to the increased appreciation for a tangible place and the reported beneficial impacts of nature.

The more individuals visit a land conservation site the more experience they gain with nature and the more appreciation they gain for the space. When individuals visit land conservation sites at least once a week, they undoubtedly enjoy and find advantages to the land, which is why they keep returning to those sites. Individuals who never or rarely visit land conservation sites might have a harder time accepting land conservation initiatives due to the lack of personal experience with them. When individuals connect to the environment and gain

exposure to nature, they develop emotional bonds and identify with natural environments (Hinds & Sparks, 2007). Regardless of the marketing techniques or informational promotions to enhance acceptance of land conservation initiatives, most individuals will rely on their own personal beliefs and experiences regarding the sites. This conclusion is supported through various other studies by scholars demonstrating the importance of experience with the natural environment. Millar and Millar found a pattern that increased experiences with the natural environment leads to more pro-environmental attitudes (1996). When Boulder residents have recurring, direct experiences with land conservation sites, their evaluation of those spaces tends to be approving, because of their personal relationship with the land in comparison to those with only indirect experiences. Hinds and Sparks found similar results in their study: that individuals' behavior towards nature is positively associated with the strength of emotional connection towards the natural environment (2007). When individuals continually return to land conservation sites, they evidently received some personal benefit during the experience which will positively influence their response to new land conservation.

Experiencing nature directly has been linked to positive psychological effects, which in return will form positive attitudes for the individual for those land conservation sites. Spending time in nature on land conservation sites has both cognitive and emotional benefits (Hartig, 2010). These land conservation sites are typically large spatial areas, where it is easy to become disconnected from nearby Boulder. This context allows individuals to disengage from their daily routine and allows them to think more clearly. A major factor influencing Boulder residents' acceptance of land conservation is how often they visit the conservation sites. The more often they visit land conservation sites, the more experiences they have with nature, thus enhancing

their personal attitudes and appreciation for the sites, while also forming positive feelings due to the emotional benefit.

Boulder's Backdrop

Boulder's land conservation has been extremely successful in protecting the natural environment encompassing the city. While the main goals for the conservation efforts have been achieved, the residents' purposes for approving of these spaces does not correspond to the purpose of land conservation. Land conservation is primarily implemented to protect specific ecosystems and habitats in order to promote populations of wild species and guard the ecology of the land. Through the qualitative study, it became apparent that "preserve" and "aesthetics" were two main aspects of respondents' belief in the purpose of conservation. These words elicit insight that residents view land conservation as a technique for protecting nature for its beauty and scenic views.

Within the scientific community the terms conservation and preservation have very different meanings. It is important to recognize that the respondents who participated in the survey came from very different educational backgrounds and may not have truly understand the scientific meaning of the words they were using. Regardless, I will proceed with demonstrating how crucial the difference is in determining the reasons behind protecting the land. Conservation entails regulating human use to guarantee the proper use of nature and resources. In contrast, preservation typically eliminates human impact and attempts to keep the land or resource exactly how it is. The structure of land entails some alteration and natural changes to an area's configuration. Preservation attempts to minimize these changes and keep the land intact. Utilizing preservation within a definition for land conservation typically implies that humans will not be able to use the land and no alterations will be made to it. This is supported by the

qualitative conclusion that many survey respondents viewed land conservation as a method to halt development. The word aesthetics was also coded in respondents' definitions due to its substantial use. "Aesthetics" is used to appreciate the beauty of Boulder's land conservation, most notably the Flatirons. When utilized in a definition, respondents were stating that land conservation's purpose was to maintain beautiful landscapes and spaces.

The combination of the terms preservation and aesthetics demonstrates that Boulder residents believe that land conservation's main purpose is to maintain beautiful spaces, while eliminating human interference. While many of Boulder's landscapes and ecosystems have been conserved, the underlying purposes for those conservation efforts have been for human benefit or desires. *The Ecomodernist Manifesto* states "explicit efforts to preserve landscapes for their non-utilitarian value are inevitably anthropogenic choices." (Asafu-adjaye & et al., 2015, p. 26). This statement resonates with the conclusions regarding land conservation for Boulder's backdrop. The ultimate underlying context is that land conservation in Boulder is done for human advantage. Residents see land conservation as a method to maintain pristine habitats and formulate a specific image of what land is acceptable for conservation. This generates norms of what nature should be—beautiful, pure, and wild. Implementing these norms creates a bias towards what lands are conserved. Typically, land conservation focuses on ecologically important tracts of spaces that are essential for specific species, ecosystem services, or resources. While Boulder's conservation efforts have been successful, and many residents do find value in the ecological importance of the land, it is apparent that the aesthetics of the land are also essential. Boulder's backdrop, the Flatirons, is an iconic image of the city. The Flatirons spurred conservation in Boulder due to the spectacular scenery they provide; therefore, it is not unusual that land conservation for aesthetic benefit has persisted throughout the decades.

Political Attitudes

Within the United States there are two main political affiliations: the Democratic Party and the Republican Party. Registered Voters designate their affiliation based upon which party most accurately corresponds to a combination of their personal belief systems and self-interest. This study concluded that an individual's political affiliation was a main influence impacting his or her acceptance of land conservation. The data indicates that Democrats are more accepting of land conservation; therefore, we can theorize that their attitudes regarding the environment contribute to determining their acceptance. The way in which Democrats view the moral relationship between humans and the environment and their method for valuing the environment and its resources will dictate their acceptance for land conservation.

Boulder is a majority Democratic city, with about 70% of its population affiliating with that political party. Because we are aware there is a large population of Democrats in the city, and we know that the party's environmental philosophy typically centers around protecting the environment and our natural resources, it becomes clear why conservation has succeeded in Boulder. Partisanship is strongly correlated with attitudes and behavior and has been studied as an active force in altering how citizens behave and perceive political initiatives, such as land conservation (Gerber, Huber & Washington, 2010). Political Affiliations are well known influences for impacting citizens' attitudes, especially regarding the polarized environmental debates. Through understanding that political affiliation is a major influence impacting individuals' actions, activists promoting land conservation can adapt their initiatives towards those groups with similar ideologies.

Conclusion

This study set out to determine which factors influence Boulder residents' acceptance of land conservation measure. Through this study it became apparent that land conservation entails trade-offs. The City of Boulder has been at the forefront of land conservation for decades, and insight into the residents' support for land conservation reveals that the social contexts is a major factor influencing the acceptance of those initiatives. After I had identified visitation frequency, salary, and political affiliation as the main factors influencing approval of land conservation, it became evident that environmental privilege, experiences with nature, and environmental attitudes are prominent components of Boulder's land conservation ethos. In addition, this study discovered that Boulder's conservation initiatives, while beneficial for protecting important ecosystems and habitats, are predominantly accepted due to the aesthetic value that land conservation provides for humans, rather than for the ecology of the land. Ultimately, the purpose of land conservation is achieved, but the underlying factors influencing why residents' support land conservation, primarily personal benefit, is inconsistent with the original goals of the initiatives.

Understanding what factors influence individuals' acceptance for land conservation is essential for leveraging support for new initiatives. Through this study it became apparent that, more important than just determining the contributing factors, understanding the impacts of their underlying influences is critical. I concluded that environmental privilege was evident in Boulder due to the significant influence of salary on a respondents' acceptance. By understanding this factor, community and government officials can work to bridge the gap to differentiate land conservation from a privileged class hobby. Promotional, educational, and community events can be tailored towards class groups that typically don't support land conservation. This will bridge

the gap within environmental movements and allow land conservation spaces to be enjoyed and supported by everyone. In addition, visitation frequency was found to be major influence. A priority for future land conservation initiatives for new sites should be to get residents to visit the sites and understand their importance. The more often people visit sites, the more accepting they are; therefore, creating marketing and promotional events to get people out to see the land conservation spaces will prove essential in securing increased acceptance. Lastly, political affiliations were concluded to be a major factor influencing individuals' beliefs and acceptance of land conservation. Focusing on groups that one knows to hold similar beliefs regarding land conservation will be essential to produce targeted, efficient marketing. Educational events, in contrast, can be directed towards those with different beliefs to educate and promote varying points of view. To enhance land conservation throughout the United States, the understanding of case studies of cities which have succeeded is imperative.

The Earth is currently undergoing environmental and geophysical changes at an unprecedented rate due to a multitude of interrelated factors. As these changes increase and become globally dire, there are increased efforts for maintaining our ecosystems, habitats, and species richness. Land conservation is one of the most essential and promising techniques for protecting our planet. Land conservation initiatives will continue to be proposed and debated throughout the future generations, and understanding the factors underlie widespread acceptance of these spaces will be crucial in their ultimate implementation. By recognizing the factors that influence acceptance of land conservation within a community renowned for its successful environmental protection, other communities can apply the results of this study to enhance their own land conservation efforts.

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Appendix A - Survey and Consent Form

University of Colorado Boulder

Permission to Take Part in a Human Research Study

Title of research study: Factors influencing Boulder citizen's perceptions of Land Conservation

Investigator: Catherine Archer

Why am I being invited to take part in a research study?

I invite you to take part in a research study because you are a Boulder, Colorado resident over the age of 18.

What should I know about a research study?

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team at catherine.archer@colorado.edu.
This research has been reviewed and approved by an Institutional Review Board ("IRB"). You may talk to them at (303) 735-3702 or irbadmin@colorado.edu if:
Your questions, concerns, or complaints are not being answered by the research team.
You cannot reach the research team.
You want to talk to someone besides the research team.
You have questions about your rights as a research subject.
You want to get information or provide input about this research.

Why is this research being done?

This research is incredibly relevant for our increasingly changing human landscape, and expansion into previous vacant, natural land. The human population continues to expand, and develop land at unprecedented rates. With governments, communities, lobbyists, and professionals working to try and halt the take-over of our natural land, understanding who is utilizing open space and their acceptance or opposition to land conservation projects is integral.

How long will the research last?

We expect that you will be in this research study for 10 minutes, and the information provided will be utilized for 3 months.

How many people will be studied?
We expect about 150 people will be in this research study.

What happens if I say yes, I want to be in this research?
If you decide to participate within this research project, you will be asked to complete a quick 5 minute survey.

What happens if I do not want to be in this research?
You can leave the research at any time and it will not be held against you.

What happens if I say yes, but I change my mind later?
You can leave the research at any time it will not be held against you. You will not need be required to explain why you have decided to leave the research.
If you decide to leave the research, contact the investigator so that the investigator can remove your information from the data, and destroy your survey and any other necessary documents.

What happens to the information collected for the research?
Efforts will be made to limit the use and disclosure of your personal information, including research study records, to people who have a need to review this information. We cannot promise complete secrecy. Organizations that may inspect and copy your information include the IRB and other representatives of this organization. The surveys and any personal information will be kept for the duration of the study.

Can I be removed from the research without my OK?
The person in charge of the research study or the sponsor can remove you from the research study without your approval. Possible reasons for removal include not fully completing the survey.

Your signature documents your permission to take part in this research.

Signature of subject	Date
Printed name of subject	
Signature of person obtaining consent	Date
Printed name of person obtaining consent	IRB Approval Date

University of Colorado Boulder

Survey

Title of research study: Factors influencing Boulder citizen's perceptions of Land Conservation

Investigator: Catherine Archer catherine.archer@colorado.edu.

1. Name (optional) _____ **2. Email (optional)** _____

3. Age: 18-24 25 – 30 31-40 41-50 51-60 61 – 70 71 +

4. Number of years as city of Boulder resident: 1-5 6-10 11-15 16-20 21-25 26-30 31-35 36 – 40 40+

5. Previous Residence: West Coast North West South Mid-West East Coast Other Country

6. Ethnicity: _____ **7. Occupation:** _____

8. Salary: Up to $9,325 $9,326-$37,950 $37,951-$91,900 $91,901-$191,650 $191,651-$416,700 $416,701+

Highest Education Level: _____

9. Political Affiliation: _____

10. Do you visit designated Land Conservation areas in Boulder? Yes No

11. What types of Conservation Areas do you visit: Conservation Easements (Private land) Open Space National Park State Park

12. Please write a definition of Land Conservation:

_____

_____

13. How often do you visit Land Conservation Areas: Once a Week 3 times a week None Once every two weeks Once a Month 5 times a Month

14. Which of these activities do you do at Land Conservation Areas? (Circle all that apply)

Children's Activities (playgrounds, sports) Climbing Equestrian Fishing Hiking Mountain Biking

Picnicking Relaxing Running Socializing Sports Viewing Wildlife Walking a Dog

Other _____

15. Why do you go to those Land Conservation Areas: (Circle all the apply)

Close to my house Close to my work Beautiful Scenery Good Facilities Enjoy Nature/Outdoors

Few People Good Trails

16. Do you support the creation of Land Conservation areas: Yes No

if ***Yes:*** **How do you support Land Conservation Areas:** Politically Financially Volunteer Ethically

17. Why do you support the creation of Land Conservation areas:

Protecting Natural Habitats Ranching Purposes Financial Benefits Recreational Uses Protecting Endangered Species Preserving Nature Esthetics

18. Would you support the creation of additional Land Conservation Areas: Yes No

19. Please provide any additional comments or information (optional):

_____

_____

Appendix B – R Script

```
#acceptance and how often visit

Data1$newyes <- as.factor(Data1$Support)

Data1$newvisit <- as.factor(Data1$OftenVisit)

ggplot(data = Data1) +

  geom_mosaic(aes(x =

                product(newyes, newvisit), fill =factor(newyes),na.rm =TRUE))+
```

```
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5))
```

#visit and acceptance

```
Data$newvisit1 <- as.factor(Data$VisitConserv)
ggplot(data = Data) +
  geom_mosaic(aes(x =
                    product(newyes, newvisit1),
                  fill=factor(newyes),na.rm =TRUE)) +
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5))
```

#Salary and why support

```
Data1$newsalary <- as.factor(Data1$Salary)
ggplot(data = Data1) +
  geom_mosaic(aes(x =
                    product(newyes, newsalary), fill =factor(newyes),na.rm =TRUE))+
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
```

```
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5))
```

#Salary and how support

```
Data1$newyes <- as.factor(Data1$Support)
Data1$newhowsupport <- as.factor(Data1$howSupport)
ggplot(data = Data1) +
  geom_mosaic(aes(x =
                product(newyes, newhowsupport), fill =factor(newyes),na.rm =TRUE))+
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5))
```

#political affiliation and support

```
Data1$newyes <- as.factor(Data1$Support)
Data1$newpolitical <- as.factor(Data1$PoliticalAffiliation)
ggplot(data = Data1) +
  geom_mosaic(aes(x =
                product(newyes, newpolitical), fill =factor(newyes),na.rm =TRUE))+
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
```

```
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5))


freq(Data1$howSupport)
distribution(Data1$howSupport)
#how often visit and how support
Data222$newoften <- as.factor(Data222$Support)
Data222$newhow <- as.factor(Data222$HowVisit)
ggplot(data = Data222) +
  geom_mosaic(aes(x =
                product(newhow, newoften), fill =factor(newhow),na.rm =TRUE))+
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5)) +
Data222$newoften = factor(Data222$newoften, levels=c("3 times a Week", "Once a Week",
"Twice a month", "Once a Month", "Never"))
#why and salary
Data4$newsalary <- as.factor(Data4$Salary)
Data4$newwhy <- as.factor(Data4$Why)
ggplot(data = Data4) +
```

```
  geom_mosaic(aes(x =
                product(newsalary, newwhy), fill =factor(newsalary),na.rm =TRUE))+
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5)) +
  Data222$newoften = factor(Data222$newoften, levels=c("3 times a Week", "Once a Week",
"Twice a month", "Once a Month", "Never"))
#how often visit and how support
Data3$newsalary <- as.factor(Data3$Salary)
Data3$newhow <- as.factor(Data3$How)
ggplot(data = Data3) +
  geom_mosaic(aes(x =
                product(newhow, newsalary), fill =factor(newhow),na.rm =TRUE))+
  guides(fill=guide_legend(title=NULL))+
  xlab(label=NULL)
theme_minimal() + scale_fill_brewer(palette="Set3")
+
  theme(axis.text.x = element_text (size =8, angle=45, vjust=.5)) +
  Data222$newoften = factor(Data222$newoften, levels=c("3 times a Week", "Once a Week",
"Twice a month", "Once a Month", "Never"))
```