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# Relationships that Extend Beyond the Fence-Line: Private Landowner Attitudes and Interest in Conservation Easements

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Relationships that Extend Beyond the Fence-Line: Private Landowner Attitudes and  
Interest in Conservation Easements

by

Ashley Lyn Vizek

A thesis submitted in partial fulfillment of the  
requirements for the degree of

Master of Science  
in  
Environmental Science and Management

Thesis Committee:  
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## ABSTRACT

Private land conservation provides an opportunity to address problems of habitat fragmentation and biodiversity loss caused by an increase in the development and parcelization of private land. Conservation easements (CEs) are an innovative tool used by land trusts to protect significant natural qualities of private land in perpetuity, while also allowing the land to remain in private ownership. Traditionally, property represents an individualistic relationship, however, CEs redefine this relationship by seeking to maximize the overlap in private and public goods in property. In this study, I explore the relationship between the common good and private property through an analysis of landowner attitudes and interest in conveying CEs. To address my research objectives I implemented a mixed-mode survey to 664 private landowners in the Whychus Creek Watershed in Deschutes County, OR. I received 257 survey responses, yielding a response rate of 41%.

The first layer of this study focuses on landowner attitudes towards CEs (Chapter 2). The results of an exploratory factor analysis suggest there are two dimensions to landowner attitudes towards CEs—an internal and external dimension. I constructed logistic regression models to predict positive internal and external attitudes and found that external attitudes are primarily influenced by environmental beliefs, whereas internal attitudes are influenced by a suite of factors including financial beliefs and perceived risk to private ownership. Furthermore, landowner knowledge and awareness of CEs may play a role in attitude development. I found that as awareness increased the number of landowners perceiving low risk also increased. Additionally, I found that those who learned about CEs from a peer were more likely to have an extreme positive or negative

attitude towards CEs. The second part of this study focuses on landowner interest in conveying a CE (Chapter 3). The results of a multinomial logistic regression analysis suggest that positive external and internal attitudes towards CEs provide the foundation for CE, while personal incentives and connections to the social and/or natural community serve as the motivation driving CE conveyance.

Although the results of this study are only representative of landowners in the Whychus Creek Watershed I argue that some of the findings may be more broadly applicable. Contributing to our conceptual understanding of CEs, I discuss how CEs may be beneficial in reintegrating the common good into private property. Further, I highlight that landowner connections to both the social community and natural environment are important characteristics of CE conveyance as well as private land conservation in general.

## DEDICATION

*To all the people and places I call home*

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## CHAPTER 1. Introduction

There is a strong culture of individualism in America which is illustrated in the common, though often misleading perception of property. Property is commonly thought of as individual and absolute such that a landowner can do what they want with their land. These ideals have been seared on the landscape as stark boundaries, serving as a symbol to keep others out. Thus, property often functions as an individual parcel separated from the surrounding landscape. Freyfogle (2007), however, argues that this perception of property is actually built upon seven myths of private ownership, among which are the beliefs that property rights are timeless and that regulations interfere with these rights. These beliefs have been brought to the forefront as environmental legislation prompts new land use regulations.

Whether it be through high profile events such as the standoff at Malheur National Wildlife Refuge—the occupation of federal lands during January 2016 by an armed militia—or local nuisance cases, as a society we are very familiar with conflicts regarding private property rights and are constantly arguing about what it means to own property. However, there is another story that is frequently buried by these contentious battles. When asked many might conceptualize property as individual, an expression of freedom, a fundamental American right, but when we look closer we see that people do not always act on this perception. Farmers and ranchers have been found to be influenced by stewardship values, a care for the land that extends beyond the self (Chouinard et al. 2008; Thompson et al. 2014; Kalcic et al. 2014; Jackson-Smith et al. 2005). In relation to land stewardship, Drescher (2014) describes the strong connections that rural landowners

form with their land and its natural environment, a meaning of property that encompasses more than self-interested freedoms. Place attachment has been well-documented in the literature and has been linked to place protective behavior (Vaske and Kobrin 2001; Nielsen-Pincus et al. 2010; Lokocz et al. 2011; Erickson et al. 2002; Norton and Hannon 1997).

The objective of my thesis is to explore the relationship between the public good and private property through an analysis of landowner attitudes and interest in private land conservation, specifically conservation easements (CEs). CEs are an effective platform to explore ideas about private and public values in property as they represent private actions that serve a public good, challenging the traditional individualistic understanding of property. My thesis is also more broadly about individual connections to land and community, connections which may drive not only effective private land conservation but a reintegration of the common good into private property. Rather than focusing on areas struggling with deep-seated property rights conflicts, this study seeks to highlight a place—Whychus Creek Watershed in Deschutes County, Oregon—where there has been effective private land conservation.

### 1.1 Brief History of Private Land Conservation

Alongside the approval of monumental environmental legislation such as the Clean Air Act, Clean Water Act and the Endangered Species Act, an increased interest in private land conservation developed (Bray 2005). Land trusts, as defined by the Land Trust Alliance, are organizations that work to conserve land. Some land trusts, such as

The Nature Conservancy, are large national or international organizations while other land trusts are small and locally based. As part of the broader environmental movement of the 1960s and 1970s, but also due to changes in the tax code, the number of land trusts conserving private land has grown exponentially (Bray 2005). The primary method by which land trusts conserve land is through CEs. A CE is an individually-crafted legal agreement between a landowner and an eligible organization, such as a land trust or government agency. CEs can be described within the context of the classic metaphor of property as a “bundle of sticks” wherein each stick represents a right. CEs allow for some of the landowner’s rights to be separated from the bundle and voluntarily sold or donated. When a landowner decides to place a CE on their property they continue to own the property but the uses and/or management practices that would negatively affect the conservation values are limited and/or prohibited.

In some cases, land trusts and CEs provide a locally-driven alternative to land use regulations. Similar to regulations, CEs serve the public good, however, CEs also acknowledge the individual nature of property, maximizing the overlap in the public and private values in property (Figure 1.1). Morrisette (2001) describes CEs as an approach which “encourages private action in pursuit of a public good in addition to, or apart from, the government’s protection of the environment” (p. 377). The literature on how CEs relate to property notions, however, is inconclusive. Rissman (2013) argues that as landowners are often compensated for a CE—either through direct payment for the purchase of a CE or through tax incentives for the donation of a CE—CEs, similar to payments for ecosystem services, further strengthen the disproportionate focus on

property rights over duties or responsibilities. In contrast, Hurley et al. (2002) stated that CEs reflect “ecosystem management principles of transcending jurisdictional and institutional boundaries” (p.304). Thus, a better understanding of landowner attitudes and interest in CEs may help inform how CEs interact with property perspectives and the broader social landscape.

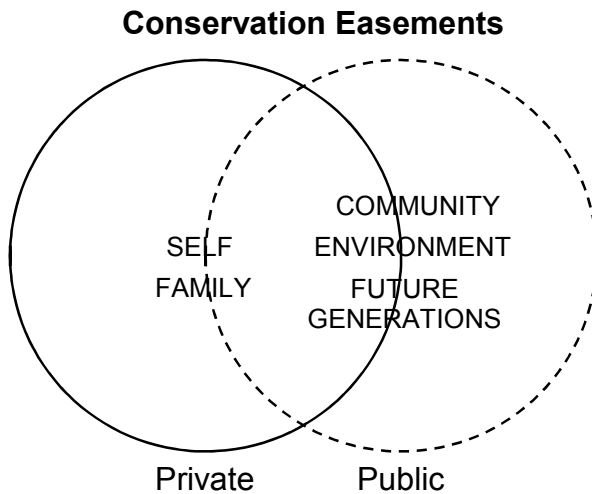


Figure 1.1 Conceptual diagram of conservation easements as maximizing the overlap in private and public values in property. Deciding to convey a CE involves considering both self-interested and other-interested (i.e. community, environment, future generations) benefits and consequences.

## 1.2 Brief History of Conservation in the Whychus Creek Watershed

Whychus Creek provides water for local residents and farmers and has historically provided aquatic habitat for species such as the steelhead trout—listed as threatened under the Endangered Species Act (ESA; Dengel 2014). Prior to 1999, over-allocation of water rights caused Whychus Creek to run dry during late summer and early fall, creating water availability issues for the community and subsequently motivating interest in streamflow and habitat restoration. Despite the extirpation of many native fish species that once inhabited Whychus Creek due to the development of dams within the



larger Deschutes River Basin, regulation under the ESA has further motivated restoration efforts in the Watershed to create and enhance suitable fish habitat. Throughout the last two decades, the community within the Whychus Creek Watershed has worked to balance the water needs of irrigation and municipal uses as well as instream uses—primarily fish habitat. Due to these efforts, stream flow during late summer and early fall has steadily increased. However, temperature pollution is still a concern, and in 2011 the Oregon Department of Environmental Quality initiated development of a TMDL (required under the Clean Water Act for 303(d) listed waterbodies) for the Upper Deschutes and Little Deschutes Sub-basins (which includes Whychus Creek) (ODEQ 2008). The TMDL development process is still underway in 2016, further motivating conservation and restoration efforts in the Whychus Creek Watershed.

The Whychus Creek Watershed is an inspiring example of collaborative restoration and conservation—illustrated by the pattern that emerges in an ownership map of the Watershed (Figure 1.2). Along lower Whychus Creek, which is predominantly privately-owned, Deschutes Land Trust has conserved a substantial amount of land through fee-simple and conservation easement acquisition. Founded in 1995 the Deschutes Land Trust (DLT) is an accredited land trust (certification provided by the Land Trust Alliance ensuring organizations meet national standards for excellence) striving to “work cooperatively with landowners to conserve land for wildlife, scenic views and local communities” ([www.deschuteslandtrust.org](http://www.deschuteslandtrust.org)). DLT has conserved 8,750 acres—2,200 of which surround Whychus Creek. This contiguous string of conserved

land speaks to the commitment of the community within the Watershed to the natural environment, which has been cultivated and strengthened over time.

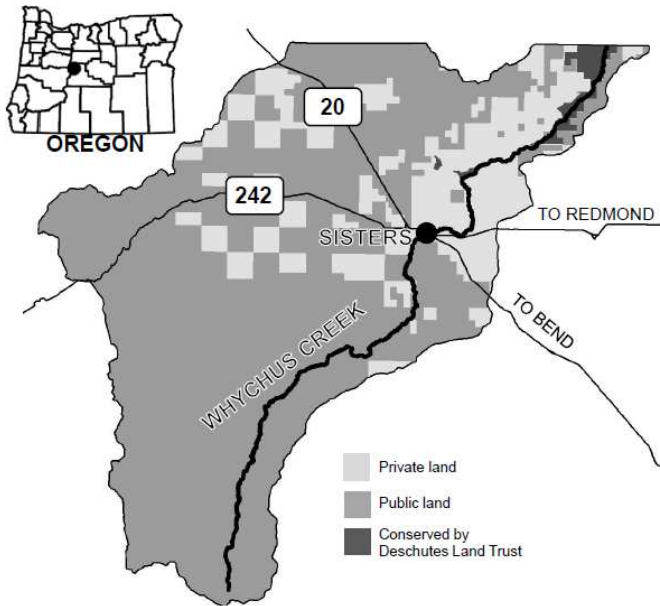


Figure 1.2 Ownership map of the Whychus Creek Watershed. Lower Whychus Creek is predominantly privately owned (light gray) and is surrounded by public protected land (medium gray). There has been a substantial amount of conservation along the creek (land owned/held by Deschutes Land Trust in dark gray).

## CHAPTER 2. Landowner Attitudes towards Conservation Easements: Balancing the Private and Public Interest in Land

### 2.1 Introduction

Land protection in the United States has historically been accomplished through the outright acquisition of land by public agencies; however, these reserves may not protect the land with the greatest biodiversity (Scott et al. 2001). A portion of the preferred habitat for 90-95% of federally threatened and endangered species is on private land (Wilcove et al. 1996). Despite the ecological importance of private land, there has been a dramatic increase in the development of private land (Brown et al. 2005). Rural and low-density communities near natural areas have become an appealing option for development as people seek quality-of-life and outdoor recreational opportunities (Maestas et al. 2001), presenting an urgency to incorporate private lands in natural area conservation.

Conservation easements (CEs), although not a new idea, emerged in the 1980s as an innovative method of protecting private land. Now, CEs are the primary tool used by land trusts (non-profit organizations that actively work to conserve land) to protect habitat, biodiversity and open space (Kiesecker et al. 2007). CEs can be described within the context of the classic metaphor of property as a “bundle of sticks” wherein each stick represents a right. CEs allow for some of the landowner’s rights to be separated from the bundle and voluntarily sold or donated. When a landowner decides to place a CE on their property they continue to own the property but the uses and/or management practices that would negatively affect the conservation values are limited or prohibited. For example,

future development and subdivision of the land is frequently prohibited under a CE. Further, a CE represents an individually-crafted legal agreement between a landowner and the easement holder (i.e. land trust or government agency), designed to maximize both public and private interests in a property. CEs are attached to the property deed, meaning that significant conservation values of a piece of land can be permanently protected.

Private land conservation through the use of CEs has grown rapidly over the last two decades as the number of land trusts has increased from about 600 in the 1980s to 1,723 in 2010 (Chang 2011). According to the most recent Land Trust Census, local and state land trusts hold 8.8 million acres of CEs and own 2.1 million acres outright (Chang 2011), a large increase from the 450,000 acres held by local and state land trusts in 1990 (Bray 2005). In an effort to keep up with the persistent expansion of CEs, Merenlender et al. (2004) called for, among other things, a better understanding of the organizations implementing CEs and landowners' interest in CEs stating that "we know little about which characteristics of easements and the institutions that hold them are attractive to landowners..." (p. 71). Landowner motivations for placing a CE on their property has now become a more common focus in the literature, yet is still lacking in extent and depth as the majority of studies are specific to agricultural landowners or landowners who have already placed a CE on their property (Miller et al. 2010; Greiner 2015).

While past research has identified influential motivations for CE adoption such as place attachment, environmental reasons and financial incentives (Ernst and Wallace 2008; Cross et al. 2011), little is known about landowner attitudes towards CEs. Attitudes

differ from motivations in that attitudes are the evaluation of a behavior, whereas, motivations are the force that drives a person to enact in that behavior. According to the theory of planned behavior (TPB), attitudes are an important determinant of behavior (Ajzen 1991). The TPB is a commonly used theoretical framework for predicting human behavior and has been extensively utilized throughout research on natural resource management (Price and Leviston 2014; Van Gossum et al. 2005; Primmer et al. 2010). The TPB states that behavior follows directly from behavioral intention, which is influenced by attitudes towards the behavior, perceived behavioral control and subjective norms. Nowak (2012) and Brain et al. (2014), among the few studies that apply the TPB to CEs, found that attitudes and subjective norms were significant predictors of landowner intention to adopt a CE. As attitudes may play a vital role in CE adoption, it is important to continue to expand our understanding of landowner attitudes towards CEs and the components that influence these attitudes. The following sections introduce issues that have been found to impact landowner conveyance of CEs, which may also be central to landowner attitudes towards CEs. Although past research has discussed the importance of these factors, they have not been analyzed together. This study builds upon past research highlighting the importance of 1) competing interests in land management decisions, 2) private property owner attitudes towards private land conservation and 3) awareness as a limiting factor to CE adoption.

### 2.1.1 Competing Interests: Dual Interest Theory

Private landowners' decisions to place a CE on their property requires multiple layers and scales of analysis—landowners are evaluating both the impacts to the current private and public values of their property and the impacts to future uses and values. Depending on the situation, CEs may reduce and/or enhance certain property values; thus, landowners are faced with a challenging evaluation of the financial, personal and environmental trade-offs associated with placing a CE on their property. Chouinard et al. (2008) explore the trade-offs farmers face in farm practice selection suggesting that a farmer has at least two dimensions to their utility, an “ego-utility” and social or “stewardly” dimension. These trade-offs are more broadly addressed in dual interest theory (Lynne 1999; Czap et al. 2012). Dual interest theory acknowledges the co-existence of both self-interest and shared-interest behavioral tendencies (Czap et al. 2012). Thompson et al. (2014) utilize Dual Interest Theory to conceptualize farmers' views of the environment as two distinct factors, “stewardship” and “production,” demonstrated through an exploratory factor analysis. Similar, to agricultural landowners considering best management practices, landowners considering a CE may also be trying to balance their own self-interests with a shared-interest in conserving a public good.

Though not explicitly represented in a dual interest framework, these are not new ideas in the CE literature. Farmer et al. (2011) identified nine motivational categories (representing both self- and shared-interests) for CE adoption, including community, culture, environmental, family heritage or legacy, financial incentives, open space protection, place attachment, societal factors and witnessing land development. Further, it

has been recognized that landowners may experience competing motivations to place a CE on their property, such as a strong place identity and conservation ethic as well as a motivation to avoid restrictions on their land (Cross et al. 2011; Farmer et al. 2011). Ernst and Wallace (2008) surveyed landowners who had participated in CEs and found that landowners were motivated more by natural resource protection and community goals than by financial incentives or family/estate matters, suggesting the important role of shared-interests in CE adoption. Although environmental or social motivations are often found to be the primary motivating factor for CE adoption, self-interests such as financial incentives should not be dismissed. Rather, financial incentives provide a means for realizing both self- and shared-interests (Ernst and Wallace 2008). As both self- and shared-interests are central to landowner adoption of CEs, a dual interest framework may also be useful in conceptualizing landowner attitudes towards CEs and highlighting the competing interests that may be shaping these attitudes.

### 2.1.2 Risk and Private Property Concepts

CEs challenge traditional perspectives on private property rights by integrating public and private interests in private land, thus landowners may believe that this integration of rights presents a risk to their ownership of the land. Among other potential risks associated with CE adoption, such as social conflict and regulation risks, landowners' perceived risk of CEs infringing upon private property rights is likely to impact their attitudes towards CEs. The perceived risk to private property rights may be impacted by landowners' attitudes towards CEs as well as their perspectives on private

property rights. Kabii and Horwitz (2006) hypothesized that landowners with strong private property rights notions will be less likely to adopt a CE, whereas, Nowak (2012) found that this relationship is mediated by attitudes towards CEs.

In order to understand how CEs relate to concepts of private property rights, it is necessary to provide a brief discussion of the foundations of property in the U.S. The concept of property is elusive and has been debated for hundreds of years. Aristotle thought of property as a “natural right” where private property encouraged the virtue of liberality (Bell and Parchomovsky 2005). Building upon the idea of a natural right in property, John Locke’s labor theory associates ownership with labor exerted upon an object. Further, the Lockean theory of property is based on the view that objects are beneficial only in private ownership (Bell and Parchomovsky 2005). During the 19<sup>th</sup> century, William Blackstone developed an understanding of property as individual and absolute entitlements (Bell and Parchomovsky 2005). Freyfogle (2003) paints a picture of post-Revolution America integrating both old ideas of feudal hierarchy and new individualistic understandings of property, arguing that it was not until the rise of industrialism that private property rights began to disintegrate from the larger public sphere. In the 20<sup>th</sup> century, the absolute and individualistic concept of property was replaced with Hohfeld’s “bundle of rights” metaphor which transformed property rights into an aggregation of rights, duties, powers and privileges (Bell and Parchomovsky 2005). However, rather than diverging from historical theories of property, some argue that the dominant paradigm of property as a bundle of rights perpetuates an individualistic perspective of private property grounded in a “cultural myth about the



supremacy of private property,” (Duncan 2005, p. 786). More specifically, Duncan (2005) states that the bundle of rights metaphor has come to focus on individual parts, disregarding interactions with the surrounding landscape and broader society.

Despite deep values built upon absolute and individual property ownership the law does not always support these values. The doctrine of nuisance (or the do-no-harm principle) explicitly imposes restrictions on property rights that negatively impact others, acknowledging the interconnectedness of land and ownership (Duncan 2005). Furthermore, as public interests and values have changed so have the legal institutions governing property rights. Environmental legislation recognizes the social value in air, water and wildlife habitat, placing a public interest in these resources. However, property is argued to be not only a legal concept, but also a dynamic social process (Yung and Belsky 2007). In some cases, property as a social institution has diverged from the legal interpretation of property leading to strong opposition to changing public policies, especially in relation to increased regulation on private land. Although culturally we may encourage an individualistic notion of property, individual perspectives on private property rights are complex and not all landowners can be characterized by the traditional perspective on property. Jackson-Smith et al. (2005) found that ranchers reported diverse beliefs about private property rights suggesting that there is more than one perspective of private property. Though the majority of ranchers believed individual property rights include the right to exclusively use the natural resources on the land, the majority also believed that these rights are subject to the rights of others, especially their neighbors and to a lesser extent society, which reflects threads of the doctrine of nuisance (Jackson-

Smith et al. 2005). Additionally, Yung and Belsky (2007) highlight that ranchers on the Rocky Mountain Front incorporated both self- and community-interests in their conceptualizations of private property. Analysis of private property rights perspectives in connection with underlying dual interests may expand our understanding of potential barriers to CE adoption.

### 2.1.3 Awareness and Peer Exchange

At the landscape-scale we have witnessed a dramatic growth in the use of CEs by land trusts; however, at the local or regional-scale the acceptance of CEs may not be as apparent. In Oregon, for instance, CEs are not as commonly implemented—nationally Oregon ranks 40<sup>th</sup> in the number of CEs (Paulus and Orizola 2015). The lack of information about private land conservation options and financing strategies has been proposed, among other economic factors, as a potential reason for low enrollment in conservation programs (Van Fleet et al. 2012; Ma et al. 2012). Van Fleet et al. (2012) found, in a survey of randomly selected forest owners, about half of respondents reported “not heard of” or “knowing nothing” about estate planning, CEs, and current use property tax reductions. Additionally, the majority of respondents reported little first- or second-hand experience with CEs (90%), estate planning (84%), and current use property tax reductions (75%). Kittredge et al. (2015) suggest that knowledge and training related to conservation practices can influence beliefs and behavior, calling for future research to explore the link between conservation awareness and behavior.

In addition to its influence on attitudes in general, awareness may also play a role in attitude strength. Bright and Manfredi (1997) found that attitudes towards issues that are highly relevant become more extreme with increasing information. However, increasing information alone may not be sufficient to explain attitude extremity. The psychology literature has explored the relationship between discussion networks and attitude extremity building upon the effect of group polarization (Moscovici and Zavalloni 1969). Attitude extremity has been described as a dimension of attitude strength and thus attitude durability (Petty and Krosnick 1995). Group polarization explains that repeated expressions of an individual's own opinion and exposure to others' opinions involving social comparison and persuasion results in attitude polarization. Further, discussions with like-minded peers was found to be significantly related to attitude extremity, whereas, discussion with non-like-minded peers was unrelated to attitude extremity (Binder 2009). This relates to the recent interest in peer exchange within natural resource management. Peer exchange involves the transfer of ideas and information between peers and has been found to contribute to how private landowners manage their land. Many programs across the U.S. have been designed to foster peer exchange, including at least 39 state-level Extension Forestry programs targeting private forest owners (Kueper et al. 2014). The understanding of the relationship between awareness and attitudes towards CEs has substantial practical implications that can help guide the effective distribution of information about CEs.

#### 2.1.4 Research Objectives

Through this research study I aim to contribute to the conceptual understanding of CEs and private landowners' evaluation of CEs, while also providing a practical perspective on attitudinal influences. More specifically the research questions guiding this project include:

1. What are landowners' attitudes towards CEs?
2. Does the structure of CE attitudes reflect competing interests?
3. How do CE familiarity, CE beliefs, CE risk perceptions and land management goals relate to landowners' attitudes towards CEs?
4. How does awareness of CEs relate to perceived risk?
5. How does awareness and sources of information influence attitude extremity?

## 2.2 Methods

### 2.2.1 Study Area

The Whychus Creek Watershed (Deschutes County, OR) provided an interesting study area to investigate my research questions. Deschutes County has been experiencing increases in population and is one of the fastest growing counties in Oregon. Private land conservation is especially important along lower Whychus Creek as it is predominantly privately owned (Figure 1.2) and vulnerable to increases in development as the area provides attractive outdoor recreational opportunities and quality-of-life resources. Whychus Creek is a valued ecological, scenic and cultural resource and has been the target of conservation and restoration efforts for 30 years. Interest in restoring Whychus

Creek gained momentum in the 1990s when many private and public entities began collaborating to restore aquatic and terrestrial habitat in order to address water allocation issues and potential federal regulation under the Endangered Species Act (ESA). Due to these efforts, stream flow during late summer and early fall has steadily increased. However, temperature pollution is still a concern, and in 2011 the Oregon Department of Environmental Quality (DEQ) initiated development of a TMDL (required under the Clean Water Act for 303(d) listed waterbodies) for the Upper Deschutes and Little Deschutes Sub-basins (which include Whychus Creek) (ODEQ 2008). As of 2016, the TMDL development process and efforts to reintroduce the ESA-listed Middle Columbia River steelhead are still underway, further motivating conservation and restoration efforts in the Whychus Creek Watershed.

### 2.2.2 Sample Selection

The target population for this study consisted of private landowners owning five acres or more within the Whychus Creek Watershed. Private landowners who owned property directly adjacent to Whychus Creek or to property protected by Deschutes Land Trust were also included regardless of the five-acre minimum criteria—although these exceptions may contain small acreage properties, they have potential to create substantial impacts on conservation within the watershed due to their location. Based on these criteria I used ESRI ArcMap software to create a sample frame from Deschutes County 2014 GIS taxlot data. After removal of all ineligible units the target population consisted of 756 landowners. Following suggestions from Dillman (2000), I determined that a

sample size of 255 would be necessary to represent the population. Assuming a 40% response rate and 5% undeliverable rate, I selected a random recruitment sample of 664 landowners.

### 2.2.3 Data Collection

During August and September 2015, I implemented a mixed-mode survey based on the Tailored Design Method (Dillman 2000). The selected sample of 664 landowners were mailed an introductory postcard that included a link to the online version of the questionnaire (day 1). Landowners were then mailed a large manila envelope containing the survey packet (day 9). Following the mailing of the survey packet I sent landowners a postcard, thanking those who had already responded and reminding those who had not completed the questionnaire to please do so (day 17). Lastly, I sent all landowners who had not responded a second packet of survey materials (day 35).

The questionnaire included 38 questions organized into six sections; the majority of the questions used a 5-point Likert-style response scale. The items utilized in this study are summarized in Table 2.2. Attitude and belief items were measured on a 5-point bipolar Likert-scale from “Strongly Agree” to “Strongly Disagree” based on past research studies (Greiner 2015; Balram and Dragičević 2005). Questions designed to measure familiarity with CEs were adapted from the Conservation Awareness Index (Van Fleet et al. 2012). Risk items were measured on a 5-point bipolar Likert-scale from “Very High” to “Very Low.” Landowner management goals were measured on a 5-point unipolar scale from “Not Important” to “Very Important.” Information source items included several

different types of questions which included 1) the source from which landowners first learned about a CE, 2) indirect and direct interactions with neighbors (adapted from Schubert and Mayer 2012) and 3) conservation behaviors. The survey instrument was reviewed by experts (land conservation professionals, including Deschutes Land Trust staff, and individuals in academia) and a purposively selected group of landowners.

#### 2.2.4 Data Analysis

I used exploratory factor analysis (EFA) to 1) explore the structure of CE attitudes and 2) create response variables for regression analysis. The major assumptions of EFA include a large sample size (Kaiser-Meyer-Olkin index), multivariate normality and sufficient correlations among the data (Barlett test of sphericity). As Likert-style survey data cannot meet the assumption of multivariate normality, it is important to note the risk of instability in the parameter estimates. Despite this, EFA is frequently used with survey data and I think it is a useful tool to gain a better understanding of the underlying dimensions of CE attitudes. Factor selection was based on a scree test and parallel analysis and estimated using a maximum likelihood approach with a “varimax” rotation. I evaluated the internal validity of the factors using Cronbach’s alpha and evaluated the fit of the model using a  $\chi^2$  test.

I then utilized logistic regression to 1) understand what variables were important in relation to positive attitudes towards CEs and 2) what variables were important in relation to CE attitude extremity. For both of these purposes I followed a similar process. I built full regression models and then constructed a reduced model by removing the

variables that increased the Aikake Information Criterion (AIC) using a backward step-wise approach. I assessed all models for potential multi-collinearity issues by comparing correlations between the independent variables and calculating the Variance Inflation Factor (VIF). I analyzed how well each model fit the data by calculating the  $\text{Chi}^2$  p-value of the deviance of the residuals. The Nagelkerke  $R^2$  value was calculated to further evaluate the model fit compared to a null model. I utilized an ANOVA to compare the full logistic model to the reduced logistic model. To evaluate the importance of the variables in the model, variable coefficients were converted to odds ratios. Lastly, I used a contingency table to analyze the relationship between awareness and private ownership risk. I used a  $\text{Chi}^2$  test to evaluate the significance of the relationship. All statistical analyses were performed in “R” version 3.0.2.

### 2.3 Results

I received 257 responses to the survey, yielding a response rate of 41%. The majority of survey respondents were older than 50 years of age and, in comparison to the general population in the Whychus Creek Watershed (US Census 2013), had a higher level of education and above-average income. Most survey respondents specified that they use their property as a primary residence and live on their property more than nine months out of the year. There was a wide range of property sizes, ranging from less than one acre to greater than 2,000 acres. Despite this, more than 90% of respondents thought protection of open space and scenic values were important to their land management decisions.



Survey respondents were moderately aware of CEs; over 60% of respondents said they knew at least a little about CEs (Table 2.1). Six percent of respondents reported completing a CE and 11% had considered a CE, while 31% knew someone who had completed a CE and 7% knew someone who had considered a CE. Thirty-three percent of respondents reported learning about CEs from a non-profit organization (land trusts, watershed council or environmental organization) while 8% learned about CEs from a peer source (spouse, relative or neighbor). Sixty percent of respondents knew of a local land trust and listed an accurate name. In general, survey respondents held positive beliefs about the characteristics of CEs. However, the majority of respondents were unsure if CEs provide adequate financial incentives.

Table 2.1 Summary of items used in attitude logistic regression. Note that some items were averaged for use in logistic regression models due to high correlations and conceptual consistency.

<b>Variables</b>	<b>Scale</b>	<b>Mean</b>	<b>SD</b>	<b>N</b>
<b>AWARENESS</b>				
Personal Experience	0-2	0.33	0.58	258
Indirect Experience	0-2	1.00	0.95	248
Land Trust Familiarity	0/1	0.60	0.49	250
Awareness Index	0-4	1.93	1.29	249
Limit uses of property that negatively impact conservation values	0-4	2.37	1.46	249
Are completely voluntary	0-4	2.19	1.56	245
Keep land in private ownership	0-4	2.15	1.52	246
Can be applied to the entire property or a portion of it	0-4	1.93	1.49	249
May provide a financial benefit	0-4	1.38	1.52	248
Give the right to monitor and enforce property restrictions to an eligible entity	0-4	1.78	1.42	248
Do not require public access	0-4	1.67	1.47	246
<b>BELIEF</b>				
Environmental Belief Index	0-4	3.08	0.83	246
Protect fish and wildlife habitat	0-4	3.14	0.79	245
Protect land from development	0-4	3.06	0.89	245
Protect open space and scenic values of the lands they are placed on	0-4	3.06	0.84	246
Protect and/or enhance stream quality	0-4	3.07	0.83	245
Financial Beliefs: Provide adequate financial incentives	0-4	2.31	0.83	245
<b>RISK</b>				
Regulation Risk: Future regulatory burdens	0-4	2.26	1.02	243

Social Risk: Creating issues with neighboring landowners	0-4	1.90	1.00	243
Private Ownership Risk: Reducing amount of land in private ownership	0-4	1.75	1.10	242
<b>MANAGEMENT GOALS</b>				
Development Protection: Protecting my property from development	0-4	2.94	1.29	246
Habitat Protection: Protection from fish and wildlife	0-4	3.00	1.04	246
Recreation: Providing recreational opportunities for me and my family	0-4	2.75	1.16	246
Income: Providing an income for me and my family	0-4	1.71	1.36	245
<b>INFORMATION SOURCE</b>				
Indirect Neighbor Interaction: Take note of how neighbor manages land	0-4	2.47	1.01	255
Direct Neighbor Interaction: Talk to neighbor about future plans for your land	0-4	0.84	1.07	246
CE Info Source: Peer	0/1	0.08	0.28	253
CE Infor Source: NGO	0/1	0.34	0.47	253
Conservation Behavior Index	0-6	1.04	1.74	248
Work with an organization to restore land	0-6	0.20	0.71	246
Volunteer with a land trust	0-6	0.28	0.81	245
Steward or care for protected natural areas	0-6	0.57	1.05	244

### 2.3.1 Conservation Easement Attitude Responses and Structure (Question 1-2)

In order to address my first research question, I considered landowner responses to the attitudinal items in the survey (Table 2.2). Most survey respondents expressed neutral attitudes towards CEs, however, at least one third of respondents agreed that CEs are 1) good for fish and wildlife habitat and 2) useful to protect my land from development. The results of the EFA illustrate that the six attitudinal items loaded well on two factors, which I describe as “external” and “internal” (Table 2.2). The “external” attitude is comprised of CE outcomes which represent a public good. The “internal” attitude is comprised of CE outcomes which represent the personal impacts of a CE. The results of the EFA guided the construction of two attitude response variables used in the following logistic regression models. Items within the external attitude were averaged to form an external attitude index. This was also done for the internal attitude items. The

average external attitude index was 0.27 with a standard deviation of 0.90, while the average internal attitude index was 0.00 with a standard deviation of 0.74.

Table 2.2 Descriptive results of responses to items designed to measure attitude towards CE adoption. Factor loadings of exploratory factor analysis and Cronbach's alpha for each factor containing items bolded items. Chi<sup>2</sup> test: H<sub>0</sub> of perfect fit cannot be rejected (4.27, 4 df, p-value=0.371). Kaiser-Meyer-Olkin measure of sampling adequacy (0.70). Barlett's test of sphericity: significant. Cumulative variance: 0.30 for external and 0.53 for internal factor.

		<i>Placing a CE on my property would be...</i>					<b>Survey Responses</b>		<b>Factor Loadings</b>		n
		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	External (0.81)	Internal (0.70)			
<b>External</b>	Good for fish and wildlife habitat	18%	33%	28%	14%	7%	<b>0.75</b>	-0.074	244		
	Useful to protect my land from development	11%	33%	32%	16%	8%	<b>0.77</b>	-0.06	243		
	Important for my community	6%	26%	51%	11%	6%	<b>0.77</b>	-0.09	245		
<b>Internal</b>	Inconvenient for my heirs	8%	33%	39%	12%	8%	-0.09	<b>0.75</b>	242		
	Incompatible with how I currently manage my land	7%	18%	42%	25%	8%	-0.18	<b>0.67</b>	244		
	Expensive for me and my family	1%	14%	63%	15%	7%	0.03	<b>0.59</b>	245		

### 2.3.2 Predicting Positive Attitudes towards CEs (Question 3)

I used logistic regression analysis to explore important factors impacting landowner attitudes towards the public and private outcomes of CEs. I found that beliefs about the environmental protection benefits of CEs was most important to landowners' external attitudes (Table 2.3). Personal experience with CEs and recreation oriented management goals were also significantly related to a positive external attitude, whereas indirect experience was inversely related. Personal experience with CEs was the only overlapping item of importance between the reduced models of internal and external attitudes. Beliefs about the financial adequacy of incentives associated with CEs and development protection management goals were significantly related to a positive internal attitude, whereas perceived risk to private ownership was inversely related.

Table 2.3 Results of logistic regression coded to predict positive external and internal attitudes (>0); 121 and 70 observations, respectively. Significant levels: † (<0.1), \* (<0.05), \*\* (<0.01), \*\*\* (<0.001). Coefficients presented as odds ratios. Nagelkerke R<sup>2</sup> presented. ANOVA revealed no significant difference between the full and reduced models.

	Full Model		Reduced Model	
	External	Internal	External	Internal
Attitude	1.17	1.05		
<b>Experience/Awareness Items</b>				
Personal Experience	2.50*	2.13†	2.60*	1.91*
Indirect Experience	0.59*	1.0	0.61*	
Awareness	0.97	0.86		
Land Trust Familiarity	1.29	1.12		
<b>Belief Items</b>				
Environmental Beliefs	4.05***	0.67	5.20***	
Financial Beliefs	1.04	1.75*		1.56*
<b>Risk Items</b>				
Regulation Risk	0.95	0.79		
Social Risk	0.83	0.92		
Private Ownership Risk	0.99	0.56**		0.56***
<b>Management Goal Items</b>				
Development Protection Goals	1.18	1.59**		1.55**
Habitat Goals	1.05	1.12		
Recreation Goals	1.41*	0.91	1.41*	
Income Goals	0.97	0.95		
<i>(n=215)</i>	<i>R<sup>2</sup>=0.36</i>	<i>R<sup>2</sup>=0.27</i>	<i>R<sup>2</sup>=0.34</i>	<i>R<sup>2</sup>=0.24</i>

### 2.3.3 Relationship between Risk and Awareness (Question 4)

I was specifically interested in the relationship between, awareness and attitudes, as well as between awareness and perceived risk to private ownership. I analyzed the relationship between awareness and perceived risk with a contingency table (Table 2.4). A Chi-square test revealed that the differences in frequency among the different levels of risk and awareness were significant. Most notably, the number of landowners who were unsure of the level of risk decreased with increasing awareness and the number of landowners who perceived low risk increased.

Table 2.4 Contingency table of awareness and private property rights risk. Chi<sup>2</sup>: 42.85, p-value: 1.11e-08

Awareness Level	Private Ownership Risk Perception Level			TOTAL
	Low	Unsure	High	
None-Very Little	9 (4%)	49 (23%)	16 (7%)	74 (34%)
Moderate	21 (10%)	28 (13%)	9 (4%)	58 (27%)
Quite a Bit	50 (23%)	18 (8%)	15 (7%)	83 (39%)
TOTAL	80 (37%)	95 (44%)	40 (18%)	215

### 2.3.4 Research Question 5: Predicting CE Attitude Extremity

In addition to exploring positive attitudes, I was also interested in attitude extremity. I included four CE experience and awareness items as well as five information source items in two logistic regression models to predict external and internal attitude extremity. I found that personal experience and direct interaction with neighbors was important to an extreme external attitude (Table 2.5). Indirect awareness, learning about CEs from a peer source, and indirect interaction were important to an extreme internal attitude, whereas awareness of CEs was inversely related to an extreme internal attitude.

Table 2.5 Results of logistic regression analysis to predict attitude extremity (>1, <-1). 32 and 15 observed extreme external and internal attitudes, respectively. Coefficients presented as odds ratios. Significant levels: † (<0.1), \* (<0.05), \*\* (<0.01), \*\*\* (<0.001). Nagelkerke R<sup>2</sup> presented for each model. ANOVA revealed no significant difference between the full and reduced models

	Full Model		Reduced Model	
	External	Internal	External	Internal
<b>Experience/Awareness Items</b>				
Personal Experience	1.98	0.70	2.16*	
Indirect Experience	1.70	2.60*		2.29·
Awareness	0.69	0.49†		0.54·
Land Trust Familiarity	0.50	0.42		
<b>Information Source Items</b>				
CE Info Source: Peer	0.40	4.89†		5.64*
CE Infor Source: NGO	1.80	1.27		
Conservation Behavior	0.97	1.53		
Interaction w/Neighbor: Direct	1.71**	1.32	1.69**	
Interaction w/Neighbor: Indirect	1.36	1.70		1.71†
(n=208)	R <sup>2</sup> =0.21	R <sup>2</sup> =0.17	R <sup>2</sup> =0.15	R <sup>2</sup> =0.12

## 2.4 Discussion

### 2.4.1 Complexity of attitudes towards CEs

My findings suggest that landowners may embody two distinct attitudes towards CEs, an attitude towards how a CE impacts their *private* interests in the property (internal attitude) and an attitude towards how a CE impacts the *public* interests in the property (external attitude). This is an important consideration because it acknowledges the difference between the private and public interests impacted by a CE as well as competing self- and shared-interests that may shape landowner attitudes. Further, this dual interest in CE attitudes is supported by the difference in important predictor items in the positive internal and external attitude models. Landowner external CE attitudes are primarily influenced by beliefs related to the environmental outcomes of CEs, items which represent social or public outcomes of CEs. Conversely, landowner internal CE attitudes are more complex and influenced by a suite of equally-contributing factors. Unlike external attitudes, landowner internal attitudes are influenced by beliefs about the adequacy of financial incentives provided by CEs. Financial incentives for CEs have been found to be more important to landowners who have a stronger economic dependence on their land (Farmer et al. 2011/2015; Ernst and Wallace 2008). However, regardless of economic dependence, this study illustrates that beliefs about the adequacy of financial incentives is an important consideration when evaluating personal impacts of a CE.

The external and internal attitude dimensions of CEs may be linked to dual interest theory as utilized in past research on farmers' attitudes towards best management

practices (Reimer et al. 2012; Thompson et al. 2014; Chouinard et al. 2008; Comer et al. 1999). Although the majority of past research specifically focuses on the trade-offs agricultural landowners face, the results of this study suggest that when evaluating CEs, private landowners in general may experience competing attitudes similar to those encountered by agricultural landowners. This may not be the case for all private land conservation behaviors as CEs are unique. CEs impact personal uses and financial outputs of the property regardless of whether the land is used for production purposes. For instance, some landowners intend to leave their land to their children. For some, CEs are seen as inconvenient for their heirs because they do not want to “tie the hands of their children” (Miller et al. 2010, p. 70; Ma et al. 2012). CEs also directly impact the value of the land by restricting future development on the property. As landowners are evaluating the personal and financial outcomes of a CE, they are also evaluating the conservation outcomes of a CE—outcomes which extend beyond their fence line. Therefore, self- and shared-interest trade-offs are not only important for agricultural landowners, but more generally to private property owners considering CEs.

#### 2.4.2 Property Rights Concepts Disconnect

Landowners who perceive a high risk of CEs “reducing the amount of land in private ownership” are less likely to have positive internal attitudes towards CEs. Consistent with Kabii and Horwitz (2006), this relationship suggests that landowners’ perspectives on private property rights is an important factor when evaluating CEs. The perception that CEs reduce the amount of land in private ownership may represent a

conflict between landowners' conceptualization of private property rights and CEs. Private property is commonly perceived as individual and absolute (Freyfogle 2007). The goals of CEs, which seek to maximize private and public interests in a property, challenge this predominant property paradigm. Therefore, a prerequisite to a positive internal attitude towards a CE, may be a stronger community-based property rights perspective. Thus, the continued use of CEs may be beneficial in shifting private property rights perspectives towards the integration of public and private interests in property.

The finding that private property risk perceptions are important to landowner attitudes towards CEs is consistent with Kabii and Horwitz (2006) and Nowak (2012), who found that an overwhelming majority of landowners embodied strong private property rights notions and that this was a significant predictor of attitudes towards CEs. Aside from Nowak (2012) few studies have focused on understanding landowner attitudes towards CEs, especially in relation to private property rights conceptualizations. More frequently, private property rights notions are addressed in relation to private land conservation in general. Fischer and Bliss (2009) found that landowners in the Willamette Valley, OR generally thought about oaks as a private good owned exclusively by the landowner. Natural resource professionals perceived this individualistic concept of property as a barrier to serving the public good (Fischer and Bliss 2009). Furthermore, Klapproth and Johnson (2001) discuss that perspectives of "owning property without outside interference" and "absolute rights" are barriers to the adoption of agricultural conservation practices.



The comparison between the characteristics of CEs and the dominant social understanding of property reveals a conceptual mismatch. The Western U.S. was settled following Lockean labor theory, as land was distributed on the basis that it was productively cultivated. Historic property concepts favoring absolute and individual dominion over property are thus ingrained within societal values. Landowners who encompass this perspective of property associate absolute control with ownership. CEs, by definition, detach some of the rights in the landowner's bundle of rights. The rights that have been detached from the bundle are no longer under the absolute control of the landowner, which could mean a loss of ownership to a landowner who views ownership as absolute control. As one of our survey respondents stated, "*Giving ownership or an "easement" to your own property over to others results in it not being your property anymore.*"

A common theme throughout the survey responses was the perceived association between CEs and government regulation. The perceived risk of CEs leading to "future regulatory burdens," although not a significant predictor of CE attitude, is an important item in further understanding how landowners perceive CEs in relation to property rights. Thirty-seven percent of respondents reported that they perceived a high or very high risk of CEs causing future regulatory burdens, which illustrates that many landowners believe CEs are associated with government regulation. Landowners frequently mentioned a lack of trust in government agencies and instability of public policies as influencing their perception that CEs may result in future regulatory burdens. This perceived association between CEs and the government may be a reflection of beliefs that government agencies

are involved in the acquisition of CEs (even those held by land trusts) or a concern that CEs may result in the identification of a publicly regulated natural resource, such as an endangered species. For instance, one respondent stated that, “*Once a person gives up property rights the door is wide open to government intrusion.*” Furthermore, it may also be that landowners view any outside influence (governmental or non-governmental) as a threat to their private property rights. Conceptually, landowners may not perceive a difference between land trusts and government agencies. The mission of land trusts—to protect and conserve publically valued natural and cultural resources—may be viewed as synonymous with inserting public interests into private property.

Although CEs may conflict with common private property concepts as discussed above, their continued utilization may also provide an opportunity to transition towards community-based and interconnected perspectives of property. Unlike regulations and land use laws, CEs are voluntary and may offer compensation to willing landowners, which illustrates a compromise between the extreme ends of individualistic and community-based property notions. As more landowners adopt CEs—recognizing that property can serve both private and public uses—this may promote change in social norms regarding property rights. Future research could investigate the role of CEs in shifting property rights norms comparing communities extensively utilizing CEs and those favoring the traditional outright acquisition of land.

### 2.4.3 Role of Awareness and Information Sources

Although awareness of CEs was not found to be an important predictor in the positive attitude models does not mean that the vital role of information sharing and outreach should be discredited. Rather, we should consider that information about CEs may be influencing attitudes through more complex pathways such as 1) acting indirectly on attitudes through risk perception and 2) influencing attitude extremity. Attitude strength is defined as encompassing qualities of durability and impactfulness (Petty and Krosnick 1995), whereas attitude extremity may be described as an intensity of feeling or “lengths to which the individual would go,” (Abelson 1995, pg. 38). Abelson (1995) argues that behavioral intentions are encompassed within the meaning of attitude extremity; thus, an increased understanding of CE attitude extremity may lead to improved predictability of attitudes and behaviors (Tesser et al. 1995). This exploration may be helpful in determining effective vehicles for CE information sharing in order to promote stable positive attitudes towards CEs.

The results of this study illustrate the indirect connection between awareness and attitudes. Awareness was found to be inversely related to landowners’ perceived risk to private ownership. Although the number of landowners who perceived high risk to private ownership did not change with increasing awareness levels, the number of landowners who perceived low risk to private ownership increased. Thus, awareness may be especially important in shifting landowners who are unsure about the level of risk towards perceiving low risk. As landowners learn more about CEs this may subdue the initial conflict with private property rights notions, especially if landowners become more

aware of the financial incentives, flexibility, and lack of government involvement. However, we should also recognize that there is a small subset of landowners who may not respond to increasing levels of awareness. A relatively consistent number of landowners perceived high risk to private ownership, regardless of awareness level. These landowners may have very strong perspectives on individual property rights and might be resistant to any loss of control—governmental or non-governmental. Despite this, the influence of awareness on the uncertainty in perceived private ownership risk illustrates a potential pathway for increased awareness to lead to CE attitude change.

There are many different strategies to increase knowledge and awareness; however, these strategies may not all be equivalent in terms of their impact on attitude. Landowners who first learned about CEs from a peer source (spouse, relative or neighbor) were five times more likely to have an extreme internal attitude. This corresponds to recent research in the natural resource management literature highlighting the importance of peer exchange programs in the conservation of private lands (Kueper 2009; Schubert and Mayer 2012). Peer exchange programs, such as the Master Woodland Manager Program in Oregon, have been designed to promote the natural process of information sharing observed among landowners. For instance, Schubert and Mayer (2012) found that the forest management approaches of non-industrial private forest owners were influenced both directly and indirectly by their neighbors. Similarly, Kueper (2009) found that forest owners discuss land management with their peers, including neighbors and friends. A possible reason why peer exchange programs have been successful may be related to the impact of peer information sources on attitude extremity.

#### 2.4.4 Implications and Limitations

A distinctive characteristic of the Whychus Creek Watershed is the chain of protected areas along the creek (Figure 1.2) illustrating an active conservation force in the area and landowners who are receptive to conservation goals. Though this level of conservation activity may be distinctive, the Whychus Creek Watershed is not alone—many local and national organizations throughout the U.S. aim to achieve similar patterns of land conservation. The widespread use of CEs as a primary strategy to protect critical habitat utilized in private land conservation projects (i.e. the Sage Grouse Initiative, a partnership of private landowners, non-profits, universities and businesses protecting 380,000 acres of habitat through the use of CEs) requires an improved understanding of how these changes in property ownership impact the surrounding landscape. My observations in the Whychus Creek Watershed may offer insight to this phenomenon. For instance, high levels of land conservation activity may be linked to increased awareness of conservation options. Landowners in the Whychus Creek Watershed were more aware of CEs than a random selection of landowners previously surveyed. Van Fleet et al. (2012) found that, in a survey of *randomly selected forest owners* in central and western Massachusetts, about half of the forest owners reported “not heard of” or “knowing nothing” about CEs. They also found that the majority of respondents reported little first- or second-hand experience with CEs (90%). In comparison, fewer (38%) landowners in our study reported “not heard of” or “knowing very little” whereas 62% knew at least a little about CEs. Although few landowners had first-hand experience with CEs, one third of respondents in our study knew someone who had a CE. This increased level of CE

awareness relative to other populations may be due to the conservation activity in the area. Though high perceived risk to private ownership was a significant barrier to positive internal CE attitudes, relatively few respondents in our study perceived high risk (19%). Therefore, the concentrated use of CEs and fee-simple acquisition for natural area protection within the Whychus Creek Watershed may also be associated with low perceived risk to property ownership. This study reveals insight that may be broadly applicable especially as CEs become more common across the landscape.

While the results of this study emphasize the complexity and importance of landowner attitudes towards CEs, it is important to note that these findings are only directly applicable to the population of private landowners in the Whychus Creek Watershed. Additionally, I wanted to acknowledge a few limitations related to my methodology. The hypothetical nature of the survey instrument used in this study may present a limitation to the accuracy of item measures. Landowners were asked generally about their attitudes, beliefs and perceived risk of CEs and were not given specific situations which might have altered their responses. As little work has focused on CE attitudes, the items I created to measure CE attitudes were based off other attitudinal measures and adapted to fit CEs. Future research should seek to improve measures used for CE attitudes and confirm the existence of the multi-dimensionality of CE attitudes. For instance, it might be beneficial to ask landowners qualitatively about their attitudes towards CEs in order to capture the breadth and diversity of attitude measures.

## 2.5 Conclusions

Despite the local characteristics that are unique to the Whychus Creek Watershed, I believe that there are also common themes that are relatively consistent across geographic regions. The trade-offs associated with the evaluation of both self- and shared-interest outcomes of CEs is an experience that is unlikely to be unique to landowners in the Whychus Creek Watershed. For instance, Cross et al. (2011) conducted a survey of agricultural landowners in Colorado and Wyoming—a population of landowners that are quite different than Whychus Creek Watershed landowners and also found that landowners experience competing motivations and barriers to CE adoption. This highlights the broader applicability of the themes discussed in my study. At the parcel-scale it is important to acknowledge the challenging trade-offs landowners encounter when evaluating the use of CEs while considering at the landscape-scale how this impacts what it means to own land.

## CHAPTER 3. Foundations of Conservation Easement Conveyance: Attitudes and Attachment to the Natural and Social Community

### 3.1 Introduction

The degrading health of our lands is fundamentally a social problem. We are challenged by the legacy left by past generations and the increasingly intensive footprint of our present society. Important natural areas and ecological communities are threatened as human populations continue to grow and expand to areas once sparsely inhabited (Azuma et al. 2014). More specifically, area near public land has become an appealing option for development as people seek quality-of-life and outdoor recreational opportunities (Maestas et al. 2001), presenting an urgency to incorporate private lands in natural area conservation.

Private property is a defining quality of American culture. Built upon ideals of liberty and equality, early perspectives of property were developed to allow any man the right to privacy and self-sustenance; however, it was also recognized that these rights were subject to the common good. Beginning in the industrial age, this connection to the common good began to degrade, favoring the rights of the private individual. Now, although landowners are still expected to use their land in a way that does not harm others, the definition of “harm” has been weakened, allowing more and more intensive uses on the land. In some cases this individualistic notion of property has resulted in sprawling destruction of natural ecosystems. However, that does not mean that the institution of private property should be dismissed. For instance, some argue that a private property ownership regime may actually provide a “solution” to the Tragedy of the Commons (Hardin 1968; Smith 1981). Rather, it is the definition of property within



the private ownership system that requires renovation. As a majority, we may favor the individual rights in property, however, in some places there has been a resurgence of community values in private property. For instance, Yung and Belsky (2007) discuss how ranchers along the Rocky Mountain Front collaborate with their neighbors attributing this to local social obligations and stewardship. Stories like this are not confined to a specific geographic region, rather, they are driven by the local community.

In this study I explore the reintegration of public values in private property by focusing on a conservation tool that, by definition, seeks to maximize the overlap between public and private values in private land. Conservation easements (CEs) are the primary tool used by land trusts (non-profit organizations that actively work to conserve land) to protect habitat, biodiversity and open space (Kiesecker et al. 2007). CEs can be described within the context of the classic metaphor of property as a “bundle of sticks” wherein each stick represents a right. CEs allow for some of the landowner’s rights to be separated from the bundle and voluntarily sold or donated. When a landowner decides to place a CE on their property they continue to own the property but the uses and/or management practices that would negatively affect the conservation values are limited or prohibited. Further, a CE represents an individually-crafted legal agreement between a landowner and an eligible organization, such as a land trust or government agency. Considering the growth in CEs—local and state land trusts hold 8.8 million acres of CEs (Chang 2011), a large increase from the 450,000 acres held by local and state land trusts in 1990 (Bray 2005)—it is important to expand our understanding of landowner interest in CEs (Kabii and Horwitz 2006; Merenlender et al. 2004).

My interest in the relationship between the common good and private property in CEs requires an incorporation of elements that extend beyond individual-level behavioral influences; thus, I sought to connect the landowner to their surroundings by considering attachment to place and community. I begin by presenting a brief summary of general behavioral theories such as the theory of planned behavior (Ajzen 1991), diffusion of innovations theory (Rogers 2003) and dual interest theory (Lynne 1999). I then discuss the sense of place and community literature in order to consider how individuals' connection to place and community may influence conservation behavior.

### 3.1.1 Parcel-Level: Key Components of Individual Behavior

The theory of planned behavior (TPB), a commonly used theoretical framework for predicting human behavior, states that behavior directly follows from behavioral intention, which is influenced by attitudes towards the behavior, perceived behavioral control and subjective norms. Though the TPB has been extensively utilized throughout research on natural resource management it has rarely been applied to CEs. Among the few studies that have applied the TPB to CEs, both Nowak (2012) and Brain et al. (2014) found that attitudes and subjective norms were significant predictors of landowner intention to adopt a CE. The diffusion of innovation theory (DOI) also provides guidance in understanding behavior stating that innovations which provide an advantage to the user, are compatible with existing norms and values, are not complex and easily experienced through trial and observation, lead to increased rates of adoption (Rogers

2003). In this study I use components of both the TPB and DOI to evaluate their relative importance to CE adoption.

As is evident in the TPB and DOI, models of human behavior often support the representation of humans as the rational ego, motivated to maximize self-interested utility. Although the TPB and DOI may not depict behavior as completely self-serving, the primary focus is on individually perceived complexity, advantage and attitudes. However, this may not always provide a realistic representation of human behavior. Lynne (1999) described the co-existence of both a self-interest and other-interest, arguing for a dual interest framework to recognize “a purposive actor embedded in a social system” (p.268). Though not explicitly represented in a dual interest framework, these are not new ideas in the CE literature. Ernst and Wallace (2008) surveyed landowners who had participated in CEs and found that landowners were motivated more by natural resource protection and community goals than by financial incentives or family/estate matters suggesting that shared-interests may play an important role in CE adoption. This “shared-interest” or “other-interest” can be represented as social—neighbors, family, the community, the public in general—or as an ecological/environmental interest. Thus, individuals may not always be influenced by dual interests depending on the depth and valence of their connection to the “other.” Further, Ernst and Wallace (2008) argue that the importance of financial incentives should not be dismissed as financial incentives provide a means for realizing both self- and shared-interests.

In both the TPB and DOI, advantage, complexity and perceived behavioral control suggest that incentives may play a role in motivating behavior, especially when

the behavior may not present a direct advantage to the individual. Koontz (2001) compared monetary and nonmonetary motivations for different land use activities concluding that landowners who were dependent on their parcel for income, owned more land, had lower household income and lower educational attainment were more likely to be motivated by financial benefits. Farmer et al. (2015) built upon this study and found that landowners who did not engage in economic land use activities were more likely to convey a CE without a tax incentive. In a study of cattle ranchers, Brain et al. (2014) found that financial incentives were a significant factor in determining likelihood to convey a CE. In this study I consider how landowner response to incentives may provide insight to the balance between self- and shared-interests in property.

### 3.1.2 Parcel of the Community: Place Protective Behavior

In America, private property, which once derived meaning from the public good, is now perceived as distinct from the public sphere and has come to primarily reflect a self-interested perspective. However, this individualistic and absolute notion of property is based on the enduring myth “that property rights somehow began in absolute form and only deviated from that pure form with the advent of modern land-use controls,” (Freyfogle 1996, p. 178). Rather, Freyfogle (1996) argues that property rights actually include two distinct components—the right to use the land (self-interested) and the responsibility to do no harm (shared-interest). Thus, property can also be conceptualized utilizing a dual interest framework such that the “self-interest” relates to the individual property rights and the “other-interest” relates to the common good. Although the

common good in property has been buried by myths of individual and absolute perspectives of ownership, connecting the institution of property to place may help uncover this forgotten ideal.

On the surface, our landscape is characterized by boundaries of ownership highlighting the stark contrast between public and private goods, but within these boundaries is a *place*. Beyond the legal institution of property, land represents a place shaped by layers of experience and aspiration, creating shared memories, “a structure of feeling” (Williams 1977; Agnew 1993), “a center of meaning” (Tuan 1979; Jorgenson and Stedman 2001). Tuan (1979) distinguishes between the physical (or natural) and human elements of place stating that “place may be said to have ‘spirit’ or ‘personality’ but only human beings can have a sense of place,” (p. 410). Places can be described as “public symbols” defined visually, promoting attention and awe, and as “fields of care” representing the places in which our emotion is expressed and anchored (p.412, Tuan 1979). Recognizing property as a place reintegrates the individual parcel into the landscape as place derives meaning from relationships between an individual and the surrounding natural and social community. Though both the natural and social environment define a place, they are often separated in the literature.

The importance of sense of place increasingly receives attention in the natural resource management and conservation literature and is typically represented as a relationship between an individual and the natural environment encompassing variations of three dimensions: place identity, place attachment and place dependence. Place identity can be defined as “those dimensions of self that define the individual’s personal

identity in relation to the physical environment” (Proshansky 1978, p. 155; Jorgensen and Stedman 2001). Place attachment can be described as the positive emotional connection between individuals (or sometimes groups of people) and their environment (Jorgensen and Stedman 2001). Lastly, place dependence highlights the role of behavioral connection such that a specific place serves an individual’s goals better than other places (Jorgensen and Stedman 2001).

In contrast, the sociology literature focuses more on the social dimensions of place and community attachment. McMillan and Chavis (1986) define sense of community as composed of four elements: membership, influence, integration and fulfillment of needs and shared emotional connection. Membership describes a feeling of belonging or investing oneself to be a member as well as a “willingness to sacrifice for the group,” (McMillan and Chavis 1986, p. 10). Influence describes both the influence exerted by the group over the individual member and the influence of a member over what the group does. Integration and fulfillment of needs involves the behavioral motivator of reinforcement such that the “individual-group association must be rewarding for its members,” (McMillan and Chavis 1986, p. 12). Lastly, shared emotional connection is related to a shared history, which is not necessarily dependent on participation but on identification (McMillan and Chavis 1986).

The difficulty in distinguishing between sense of place and sense of community emphasizes the importance of both the physical and social environment when seeking to describe the meaning of place. Some researchers have incorporated both physical and social dimensions into community attachment arguing that this integration is especially

useful when examining how people living next to protected natural areas connect to their community (Brehm et al. 2004; Clark and Stein 2003). Mesch and Manor (1998) conclude that both “locally based social relationships and satisfaction with the environment are related to the development of place attachment,” (p. 518).

As a meaningful expression of relationships between people and their social and physical environment, place is an integral part of why people engage in collective action to protect a place of shared meaning or conserve the natural qualities of a property (Norton and Hannon 1997; Erickson et al. 2002; Vaske and Kobrin 2001; Lokocz et al. 2011; Nielsen-Pincus et al. 2014). Past research in natural resource management has investigated the role of sense of place as a predictor of pro-conservation behavior. Stedman (2002) found that higher place attachment and lower place satisfaction are associated with place protection behavior. More specifically, Farmer et al. (2011) found that place attachment was the primary motivating factor for landowners who had conveyed a CE. Although the natural resource management literature typically portrays sense of place as the relationship between self and the natural environment, connections to the social community may also play a key role in conservation behavior. Clark and Stein (2003) found that “residents identify with different aspects of their community; for some residents the physical-natural landscape is an important part of how they relate to their community. Both socially and landscape-oriented stakeholders indicated high levels of attachment with the community,” (p.875). Further, Ernst and Wallace (2008) highlight the role of “community-mindedness” as a motivator for participation in private land conservation programs. Attachment to both the natural and social community within a

place may be a motivating factor in CE adoption as well as fundamental to the connection between the common good and private property.

### 3.1.3 Research Objectives

In this study I strive to weave together components of behavioral theory and place attachment in order to contribute to the discussion of land conservation and the resurgence of community interests in property. More specifically, the research questions guiding this study are:

1. How do individual characteristics (TPB: attitudes, perceived behavioral control, subjective norms; DOI: complexity and advantage; demographics) and external relationships (connections to social and natural community, length of ownership) influence likelihood of conveying a CE?
2. Which of the above characteristics differentiates those who are *Likely* to convey a CE and those who are *Unsure* or *Unlikely* to convey a CE?

## 3.2 Methods

### 3.2.1 Study Area

This study takes place in the Whychus Creek Watershed (Deschutes County, OR) near the small city of Sisters. Deschutes County has been experiencing increases in population and is one of the fastest growing counties in Oregon. The population of Sisters has more than doubled between 2000 and 2010, growing from 961 to 2,038. Private land conservation is especially important along lower Whychus Creek as it is predominantly



privately owned and vulnerable to increases in development as the area provides attractive outdoor recreational opportunities and quality-of-life resources. Whychus Creek is a valued ecological, scenic and cultural resource and has been the target of conservation and restoration efforts for 30 years. Figure 1.2 illustrates the distinction between public and private land in the watershed as well as a string of privately protected lands. The Deschutes Land Trust has conserved 2,200 acres of land surrounding Whychus Creek which speaks to the commitment of the community to environment.

### 3.2.2 Sample Selection

The target population for this study consisted of private landowners owning five acres or more within the Whychus Creek Watershed. Private landowners who owned property directly adjacent to Whychus Creek or to property protected by Deschutes Land Trust were also included regardless of the five-acre minimum criteria—although these exceptions may contain small acreage properties they have the potential to create substantial impacts on conservation within the Watershed due to their location. Based on these criteria I used ESRI ArcMap software to create a sample frame from Deschutes County 2014 GIS taxlot data. After removal of all ineligible units the target population consisted of 756 landowners. Following suggestions from Dillman (2000) I determined that a sample size of 255 would be necessary to represent the population. Assuming a 40% response rate and 5% undeliverable rate I selected a random recruitment sample of 664 landowners.

### 3.2.3 Data Collection

During August and September 2015, I implemented a mixed-mode survey based on the Tailored Design Method (Dillman 2000). The selected sample of 664 landowners were mailed an introductory postcard that included the link to the online version of the questionnaire (day 1). Landowners were then mailed a large manila envelope containing the survey packet (day 9). Following the mailing of the survey packet I sent landowners a postcard, thanking those who had already responded and reminding those who had not completed the questionnaire to please do so (day 17). Lastly, I sent all landowners who had not responded a second packet of survey materials (day 35).

The questionnaire included 38 questions organized into six sections in which the majority of the questions were 5-point Likert-style items. The items utilized in this study are summarized in Table 3.1. I assessed landowner intention to convey a CE on a 5-point Likert-scale from “Very Likely” to “Very Unlikely” by asking: “In general, how likely or unlikely would you be to place a conservation easement on your property?” I also measured landowner response to five different incentives: 1) property tax benefit, 2) estate tax benefit, 3) income tax benefit, 4) paid the value of the CE and 5) property rights assurances. Attitude items were measured on a 5-point bipolar Likert-scale from “Strongly Agree” to “Strongly Disagree” based on past research studies (Greiner 2015; Balram and Dragičević 2005). I created an “internal attitude” and “external attitude” index based on the results of an exploratory factor analysis (see Chapter 2). I used the 12-item Sense of Place Index developed and tested by Jorgensen and Stedman (2001) to measure landowner connection to the natural environment. Based on past research

studies, sense of place was represented as an additive index variable (Nielsen-Pincus et al. 2014). I used the 8-item Brief Sense of Community Index developed by Peterson et al. (2008) to measure landowner connection to their social community. I represented sense of community using the four hypothesized factors: membership, influence, integration and fulfillment of needs and shared emotional connection. Although, the Brief Sense of Community Scale was designed to measure sense of community within a neighborhood, and not necessarily the rural landscape of the Whychus Creek Watershed, I thought that the dimensions represented in the scale were still relevant and applicable. I also included length of ownership (years) as a measure of community and place connection (McMillan and Chavis 1986; Brehm et al. 2004). Based on past research studies, I included two demographic items in the analysis: property size and political views (Brenner et al. 2013; Jorgensen and Stedman 2006; Nielsen-Pincus et al. 2014). I measured political views on a 5-point bipolar Liker-scale from “Very Conservative” to “Very Liberal.” The survey instrument was reviewed by experts (land conservation professionals including Deschutes Land Trust staff, and individuals in academia) and a purposively selected group of landowners.

#### 3.2.4 Data Analysis

I used a multinomial logistic regression to explore the relationship between variables of interest and intention to convey a CE. Multinomial logistic regression is an extension of binary logistic regression allowing for more than two response categories. The response variable, referred to as baseline interest in conveying a CE, was recoded

into three categories: *Unlikely*, *Unsure* and *Likely*. Multinomial logistic regression was an appropriate analysis method because I was interested in both determining influential factors predicting *Likely* to convey a CE, and describing the difference between those who were *Unsure* and those who were *Likely* to convey a CE. I assessed all models for potential multi-collinearity issues by comparing correlations between the independent variables and calculating the Variance Inflation Factor (VIF). Length of ownership and property size were log transformed which appropriately addressed issues of non-normal distributions. All statistical analyses were performed in “R” version 3.0.2.

### 3.3 Results

#### 3.3.1 Descriptive Results

I received 257 responses to the survey, yielding a response rate of 41%. The majority of survey respondents were older than 50 years of age and, in comparison to the general population in the Whychus Creek Watershed (US Census 2013), had a higher level of education and above-average income—which is likely the result of my target population being landowners rather than the general population. Most survey respondents specified that they use their property as a primary residence and live on their property more than nine months out of the year. The average number of years that survey respondents have owned property in the Watershed was 18 years, ranging from less than one year to 65 years, with a median length of 15 years. The average property size was 39 acres, ranging from less than one acre to greater than 2,000 acres, with a median property

size of 10 acres. Political views were evenly distributed between conservative and liberal perspectives.

The majority of survey respondents did not express an interest in conveying a CE as 48% reported that they were *Unlikely*, 39% were *Neither Likely nor Unlikely* (i.e. *Unsure*) and 13% were *Likely* to convey a CE. However, of those who expressed a baseline interest of *Unsure*, 78% shifted to *Likely* if offered an incentive and 44% of those who expressed a baseline interest of *Unlikely* shifted to *Likely* if offered an incentive. Table 3.2 describes the percentage of landowners within the *Unsure* and *Unlikely* baseline interests who shifted to *Likely* to convey a CE when offered an incentive.

Most respondents expressed neutral attitudes towards CEs, however, at least one third of respondents agreed that CEs are good for fish and wildlife habitat and useful to protect land from development. About 25% of respondents reported that they thought their community was supportive of CEs. In terms of connections to place and community, respondents reported high levels of sense of place and sense of community.

Approximately 50% of respondents agreed with the following statements about the Whychus Creek Watershed: 1) I really miss it when I am away too long, 2) It reflects the type of person I am, 3) I feel I can really be myself when I am there and 4) It is my favorite place. More than 50% of respondents agreed with the following statements about their community in the Watershed: 1) I can get what I need in my community, 2) I feel connected to my community, 3) I feel like a member of my community, 4) I have a good bond with others in my community and 5) I belong in my community.

Table 3.1 Survey responses to items used to construct model variables. Cronbach's alpha in parentheses.

Variables	Mean	SD	N
<b>RESPONSE VARIABLE:</b> Intention to convey a CE	-0.58	1.05	245
<b>INCENTIVE RESPONSE ITEMS</b>			
Property Tax Benefit	0.32	1.12	235
Estate Tax Benefit	0.20	1.14	236
Income Tax Benefit	0.30	1.12	237
Paid Value of CE	0.35	1.15	235
Property Rights Assurances	0.34	1.13	237
<b>ATTITUDE ITEMS</b>			
External Attitude (0.81)	0.27	0.90	245
Good for fish and wildlife habitat	0.43	1.14	244
Useful to protect my land from development	0.24	1.09	243
Important for my community	0.15	0.93	245
Internal Attitude (0.70)	0.00	0.74	245
Convenient for my heirs	-0.23	1.02	242
Compatible with how I currently manage my land	0.10	1.01	244
Inexpensive for me and my family	0.12	0.77	245
Perceived Advantage	-0.21	0.80	243
Perceived Ease	-0.07	0.73	242
Subjective Norms	0.18	0.81	215
<b>PLACE ITEMS</b>			
Sense of Place Index (0.90)*	3.76	5.76	239
It is my favorite place to be	0.55	0.85	240
As far as I am concerned, there are better places to be*	-0.19	0.88	239
It is the best place for doing the things I enjoy	0.45	0.80	238
I would enjoy the activities I undertake there just as well in another place*	0.09	0.87	235
It reflects the type of person I am	0.65	0.77	234
I feel that I can really be myself when I am there	0.60	0.86	237
I really miss it when I am away too long	0.60	0.92	235
I feel happiest when I am there	0.44	0.85	234
I don't really identify with the Whychus Creek Watershed*	-0.42	1.04	238
<b>COMMUNITY ITEMS</b>			
Needs Fulfillment (0.56)	0.44	0.63	237
I can get what I need in my community	0.63	0.76	237
My community helps me fulfill my needs	0.24	0.76	233
Emotional Connection (0.86)	0.60	0.76	239
I feel connected to my community	0.61	0.80	238
I have a good bond with others in my community	0.59	0.82	235
Membership (0.87)	0.60	0.76	238
I feel like a member of my community	0.61	0.82	237
I belong in my community	0.58	0.80	236
Influence (0.65)	0.12	0.75	238
I have a say about what goes on in my community	0.06	0.90	237
People in my community are good at influencing each other	0.17	0.81	236
Length of Ownership (years)	18.32	12.92	254
<b>DEMOGRAPHIC ITEMS</b>			
Property Size (acres)	39.09	150.65	255
Political Views	-0.04	1.25	227

\*Sense of Place Index on scale of -18 to 18. All items that were negatively worded were inverse coded. All other ordinal variables are on a scale of -2 to 2 where -2 is “Strongly Disagree” (or “Very Liberal” for Political Views) and 2 is “Strongly Agree” (or “Very Conservative” for political views).

Table 3.2 Percentage of respondents within the Unsure and Unlikely baseline interest group that shifted to Likely to convey a CE if offered an incentive.

Baseline Interest	Percentage Likely to Convey CE				
	Property Tax	Estate Tax	Income Tax	Paid the Value of CE	Property Rights Assurances
Unsure	61%	55%	54%	55%	65%
Unlikely	28%	24%	27%	33%	28%

### 3.3.2 Multinomial Regression Results

Multinomial logistic regression results are presented in Table 3.3. I found that external and internal attitudes towards CEs were highly significant items differentiating between *Unsure* and *Unlikely*, whereas only external attitude was important when comparing *Unsure* and *Likely*. Perceived ease (i.e. behavioral control), subjective norms and financial advantage (TPB and DOI variables) were not significant predictors in the model; though perceived ease was slightly significant when comparing *Unsure* and *Likely*. Sense of place was a significant item when comparing *Unsure* and *Unlikely* whereas sense of community items (emotional connection and membership) appeared to be important when comparing *Unsure* and *Likely*. The demographic variable, length of ownership, was the only item that was significant to both *Unlikely* and *Likely*. Lastly, different demographic items were important for predicting inclusion in the *Unlikely* or *Likely* response category. Political views were important in differentiating between *Unsure* and *Unlikely* and property size was an important factor differentiating between *Unsure* and *Likely*.

Table 3.3 Multinomial logistic regression predicting general intent to adopt a conservation easement structured as three discrete categories (Likely [27], Unsure [72], Unlikely [86]) where “Unsure” is the reference category. N=185. Significant levels: \* (<0.10), \*\* (<0.01), \*\*\* (<0.001). McFadden R<sup>2</sup>: 0.32. Chi<sup>2</sup>: p<0.001

<i>Unsure vs. Unlikely</i>	<b>B</b>	<b>exp(B)</b>	<b>SE</b>	<b>Z</b>	<b>p-value</b>
Intercept	-0.38	0.69	0.67	-0.56	0.57
External Attitude	-1.01	0.36	0.35	-2.92	0.003**
Internal Attitude	-0.78	0.46	0.35	-2.21	0.03*
Financial Advantage	-0.62	0.54	0.44	-1.41	0.16
Perceived Ease	0.18	1.19	0.40	0.44	0.66
Subjective Norms	-0.19	0.83	0.30	-0.64	0.52
Sense-of-Place	-0.09	0.91	0.04	-2.19	0.03*
Emotional Connection	0.24	1.27	0.55	0.43	0.67
Needs Fulfillment	-0.08	0.92	0.50	-0.17	0.87
Membership	0.96	2.61	0.63	1.54	0.12
Influence	-0.29	0.75	0.34	-0.86	0.39
Log(Length of Ownership (Years))	-0.27	0.76	0.13	-2.03	0.04*
Log(Property Size (Acres))	0.34	1.45	0.24	1.57	0.12
Political Views	0.30	1.34	0.17	1.74	0.08*
<i>Unsure vs. Likely</i>	<b>B</b>	<b>exp(B)</b>	<b>SE</b>	<b>Z</b>	<b>p-value</b>
Intercept	-2.26	0.10	0.89	-2.53	0.01*
External Attitude	0.96	2.61	0.55	1.75	0.08*
Internal Attitude	0.34	1.40	0.45	0.76	0.45
Financial Advantage	-0.35	0.71	0.49	-0.71	0.48
Perceived Ease	0.86	2.37	0.48	1.72	0.09*
Subjective Norms	0.56	1.76	0.41	1.36	0.17
Sense-of-Place	0.03	1.03	0.06	0.54	0.59
Emotional Connection	1.52	4.60	0.86	1.77	0.08*
Needs Fulfillment	0.74	2.09	0.80	0.92	0.36
Membership	-1.56	0.21	0.92	-1.70	0.09*
Influence	-0.08	0.92	0.46	-0.18	0.85
Log(Length of Ownership (Years))	0.38	1.46	0.18	2.05	0.04*
Log(Property Size (Acres))	-0.64	0.53	0.32	-2.02	0.04*
Political Views	0.02	1.02	0.23	0.09	0.93

### 3.4 Discussion

#### 3.4.1 Attitudes: Foundation of CE Conveyance

According to the Theory of Planned Behavior (TPB; Ajzen 1991), behavioral intention is directly influenced by attitudes towards that behavior (as well as perceived behavioral control and subjective norms). Dual Interest Theory (Lynne 1999) also seeks to explain human behavior by recognizing both self- and other-interests in behavioral



tendencies. Consistent with past research, the results of the regression analysis highlight the importance of both external and internal attitudes in understanding behavioral intentions to adopt a CE (Nowak 2012; Brain et al. 2014). External and internal attitudes towards CEs exhibited similar levels of association with behavioral intention suggesting that it is necessary for a landowner to have both a positive attitude towards the personal as well as the social or ecological outcomes of a CE. However, when differentiating between landowners who are *Unsure* and those who are *Likely* to convey a CE, external attitudes appear to be more important than internal attitudes. This supports past research utilizing a dual interest framework to conceptualize the trade-offs that agricultural landowners face when making land management decisions (Chouinard et al. 2008; Thompson et al. 2014). Similar to the agricultural landowners in these studies, when considering a CE, landowners are not only thinking about how a CE would impact them personally, but also how it impacts the community (both ecologically and socially).

Though the results illustrate a strong link between attitudes and behavior, I also found evidence of a gap in this connection. Positive external and internal attitudes are important when comparing *Unsure* and *Unlikely*, but external attitudes were only slightly significant when differentiating between *Unsure* and *Likely*, meaning that having positive attitudes towards CEs does not necessarily lead to being *Likely* to convey a CE. Heberlein (2012) argues that although attitudes are a key component of behavior, there are other situational and experiential factors at play. For instance, in a research study of hunting behavior, those who had negative attitudes towards hunting did not hunt and those that hunted did not have negative attitudes (Heberlein 2012; Ljung et al. 2012), however, the

majority of people who had positive attitudes towards hunting did not hunt, suggesting that there are other important factors. Similarly, there was a large proportion of respondents who had positive attitudes towards CEs, but were not likely to convey a CE (62% of respondents in the *Unsure* response category had positive external CE attitudes). The regression was built to predict baseline interest in conveying a CE, thus, there may be specific situational factors constraining respondents' intention. Landowners in the *Unsure* response category may be uncertain about the specific circumstances related to CE conveyance such as the financial costs and benefits. When offered at least one of the five incentives over 75% of those whose baseline interest was *Unsure* shifted to *Likely* to convey a CE. While personal costs and benefits were important to those in the *Unsure* group, positive external and internal attitudes provided the necessary first step towards CE conveyance.

### 3.4.2 Connection to Place: Motivation for CE Conveyance

Items representing landowner connection to both the surrounding natural and social community were significant predictors of likelihood to convey a CE. However, I found that the social and natural dimensions of place attachment do not interact with CE adoption in the same way. Consistent with past research, higher levels of sense of place were related to an increase in the likelihood of CE adoption (Cross et al. 2011; Farmer et al. 2011; Ernst and Wallace 2008). While sense of place was significant in the models, its impact was much smaller relative to external and internal attitudes. Similarly, Mullendore et al. (2015) also reported a significant yet weak association between sense of place and

conservation behavior suggesting that sense of place may be less important when compared to other factors. Further, this may be indicative of the difference between place protective behaviors in general and the specific behavior of adopting a CE.

In addition to sense of place, I found that sense of community may be related to CE adoption, though different dimensions of sense of community seem to impact CE adoption in different ways. An increase in emotional connection to the community and a decrease in membership were slightly significant when moving from *Unsure* to *Likely*. This suggests that landowners who are emotionally connected to their social community may be more likely to convey a CE. On the other-hand, membership seems to decrease the likelihood of conveying a CE; however, this may be a relationship unique to the Whychus Creek Watershed. There is a high level of conservation activity occurring in the Watershed, thus, landowners who feel like they are a member of this community may not see a need for CEs. Landowners who were *Unsure* reported the lowest levels of overall sense of community suggesting that sense of community may manifest in different ways, pushing landowners toward *Likely* or *Unlikely* depending on the more specific connections they have with their community. For instance, the development of a strong emotional connection to the community may shift intentions towards *Likely* to convey a CE.

Length of property ownership was a significant variable describing the difference between landowners who were *Unsure* and those who were *Likely* to convey a CE (as well as *Unsure* vs. *Unlikely*). This item may be capturing an important component of place attachment, *time*, that might not have been adequately addressed in the sense of

place and sense of community scales. Relph (1976) discusses the relationship between time and place suggesting that “places themselves are the present expressions of past experiences and events and of hopes for the future,” (p.33). Nielsen-Pincus et al. (2010) found that length of residence was positively related to place attachment. Though it is possible for an attachment to place and community to develop in a short amount of time, the depth and meaning of this relationship may be expanded over time as a history of moments and experiences is developed. Time may be even more influential if the place that this time was spent is home, which is important to consider in this study as most respondents reported that the primary use of their property was for a residence. Relph (1976) explains that “home in its most profound form is an attachment to a particular setting, a particular environment, in comparison with which all other associations with places have only a limited significance,” (p. 39). In support of this concept, Lokocz et al. (2011) found that residents who grew up in an area had higher levels of place attachment in comparison to long-term residents who did not grow up in an area. When a foundation of positive attitudes towards CEs has already been established—which describes landowners in the *Likely* and *Unsure* category—these results suggest that sense of community and, maybe more importantly, a history of place, may be an important driving factor of CE conveyance.

### 3.5 Conclusion and Limitations

The Whychus Creek Watershed is unique in that there is a chain of protected areas along the creek (Figure 1.2) illustrating an active conservation force in the area and

landowners who are receptive to conservation goals. The results of this study suggest that connections to both the natural and social environment may play an important role in the effective private land conservation occurring in the Whychus Creek Watershed. The distinction between connections to the natural environment and social community may be important practically as landowners may be motivated differently by the natural environment or social community. For instance, when presenting CEs to those who are *Unsure* about conveying a CE, it may be more important to highlight the environmental or physical place-based benefits of CEs rather than the social or cultural benefits. Additionally, landowners may be motivated differently by the monetary and nonmonetary benefits of CEs; while 39% of landowners expressed a baseline interest of *Unsure*, more than 75% shifted to *Likely* when offered an incentive. This suggests that, in comparison to those who expressed a baseline interest of *Likely* to convey a CE, those in the *Unsure* group may place more weight on personal financial benefits or may be situationally limited in their ability to convey a CE.

While the results of this study emphasize the importance of sense of place and community to CEs, the findings are only directly applicable to the population of private landowners in the Whychus Creek Watershed. Future research is needed to explore these ideas further by comparing landowners in study areas with varying levels of sense of place and community. Additionally, I would like to acknowledge a few limitations related to the methodology. While I believe that the Brief Sense of Community Scale allowed me to capture theorized components of community attachment such as emotional attachment or membership, I was unable to decipher what exactly this community represented to

landowners. Therefore, in order to adequately capture landowners' relationships to the social community I found that it might be helpful to integrate a qualitative aspect to the methodology.

Despite these limitations, I believe that the general themes uncovered in this study are important considerations in CE conveyance, but also to land stewardship in general. Stewardship, or caring for the land, is a natural behavior that develops over many years of living with the land. Berry (1991, p. 390) outlines rules to living with the land which appropriately illuminates the themes central to this research study:

Land cannot be properly cared for by people who do not know it intimately, who do not know how to care for it, who are not strongly motivated to care for it, and who cannot afford to care for it. People cannot be adequately motivated to care for the land by general principles or by incentives that are merely economic. That is, they won't care for it merely because they think they should do so or merely because somebody pays them to do so. They are motivated to care for land—to live with it—insofar as their interest is direct, dependable, and permanent.

## CHAPTER 4. Conclusion

### 4.1 Strong Internal and External Attitudes as Foundations for CE Conveyance

This thesis highlights that strong positive attitudes towards—both the personal and social/ecological benefits of CEs—provide the foundation for CE conveyance. The following statements summarize the characteristics of landowner interest in CEs.

- Landowners are unlikely to convey a CE if they 1) have negative attitudes towards CEs in general, 2) have only positive attitudes towards the external benefits of CEs or 3) have only positive attitudes towards the personal benefits of CEs.
- Positive external attitudes towards CEs are primarily influenced by landowner beliefs about the characteristics of CEs, which may be shifted through increased awareness and knowledge of CEs.
- Positive internal attitudes towards CEs are influenced by a suite of factors including beliefs about the financial benefits of CEs and perceived risk to private ownership. Both financial beliefs and perceived risk may also be impacted through increased awareness and knowledge of CEs. However, those who perceive a risk to private ownership with entrenched perspectives on property rights may not respond to increased knowledge.
- Learning about CEs from a peer source is an important component of attitude extremity, thus, programs which encourage the exchange of information between peers may be beneficial in developing strong and stable attitudes towards CEs

(however, the direction of extremity will depend on the attitude valence of those sharing information).

#### 4.2 Incentives and Connections to Community as Motivations for CE Conveyance

While positive attitudes towards CEs provide the foundation for CE conveyance, alone they may not be enough to generate interest in conveying a CE. Landowners must also be strongly connected to their social and/or natural community. These connections supply the motive for CE conveyance as those not connected to place may not see a reason for a CE, except when offered a personal incentive.

- Landowners who have a strong emotional connection to their social community are more likely to convey a CE.
- Landowners who have a strong sense of place are more likely to convey a CE.
- When discussing CEs with landowners it may be important to stress how CEs benefit both the social and natural community as landowners may connect to different aspects of place.
- Landowners who may not be strongly connected to their social or natural community, may respond to personal incentives for CE conveyance.

#### 4.3 Final Thoughts

Although my thesis is specific to conservation easements and geographically limited to a small community in Deschutes County, Oregon, I think the overarching theme of community connection is more broadly applicable. Before coming to Portland



State University, I worked for a private foundation in Chicago, Illinois. I was fortunate enough to work with many land trusts and local government agencies, many of which were driven by passionate, hard-working individuals devoted to conserving land. While assisting with the development of a new grant program focused on community stewardship, I gained insight to the role of community in land protection, learning that a strong community spirit often provides the backbone for effective land protection. Though these are well-known ideas in the land protection community, they are often overlooked in the literature. Thus, I conclude by reminding us of the community spirit in private land conservation. Conserving land involves weaving together individual perspectives to tell a story about a *community* and their connection to the landscape.

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APPENDIX A. Survey Instrument



A Survey about You and Your Land  
**Whychus Creek Watershed**

**2015**

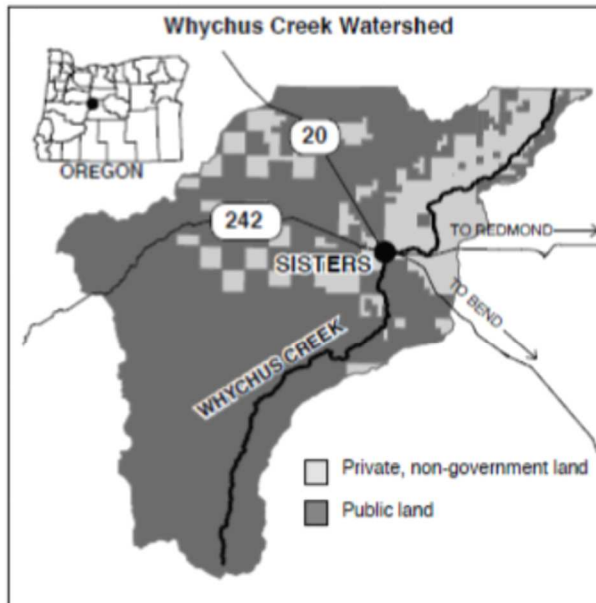
 Portland State  
UNIVERSITY

**your  
LAND**  

## Private Land Conservation



Portland State University is interested in learning about your beliefs and attitudes towards select land use and land management behaviors. We think this information is important to help guide the communication of conservation information and strengthen programs focused on private land management to better meet the needs of landowners.



A watershed is an area of land within which all water drains to the same place. In the Whychus Creek Watershed, private land (shown in light gray) surrounds much of the creek north of Sisters. Private land is important as it often provides vital habitat for plant and animal species and also maintains the local culture of a community by supplying open space and scenic views.

Throughout the last few decades there has been an increase in rural growth and development on private land, which is especially evident in Deschutes County. In the past ten years, Deschutes County has experienced the greatest population growth of any county in Oregon.

In order to protect significant attributes of private land, conservation interests, communities and landowners have turned more and more to tools like conservation easements.

A **conservation easement** is an individually-crafted voluntary legal agreement between a landowner and **land trust** (a non-profit organization that works to protect land) or government agency, which permanently protects significant conservation values of a piece of land. When a landowner decides to place a conservation easement on their property, they continue to own the property, but the uses of the property that would negatively affect the conservation values are limited.

Conservation easements can protect natural habitats, agricultural or forestry uses as well as scenic views and areas of cultural significance. They are uniquely written to address each landowner's needs and can be applied to the entire property or a portion of it. In some cases, conservation easements provide landowners with a tax benefit. There is no requirement that the landowner allow public access to the property unless the landowner specifically desires to make public access part of the agreement.

We would like to determine if information about conservation easements is widely known. Please help us by answering the following questions about your property as well as your familiarity, knowledge and opinions of conservation easements and select land management practices.

**Your responses will be kept confidential**

## Survey Instructions

- Please carefully read each question and make your responses clear
- Feel free to write in additional comments or explanations anywhere on the survey
- **All of your answers will be kept confidential**
- Please mail your completed survey back in the prepaid envelope provided

## Your Land and You



**1** Approximately how many years have you owned property in the Whychus Creek Watershed? \_\_\_\_\_ years

**2** Approximately how many acres of land do you own in the Whychus Creek Watershed? \_\_\_\_\_ acres

**3** What is the current use of the land you own in the Whychus Creek Watershed? **Check all that apply.**

<input type="checkbox"/> Primary residence	<input type="checkbox"/> Recreation	<input type="checkbox"/> Ranching
<input type="checkbox"/> Farming	<input type="checkbox"/> Timber/Forestry	<input type="checkbox"/> Other: _____

## Conservation Easements and You



We are interested in learning about what you, as a landowner, know and think about the unique land use planning option called a conservation easement.

**4** How much do you know about conservation easements? **Select one response.**

Never heard of before reading this questionnaire

Heard of, but know very little

I know a little

I know quite a bit

I know a great deal

**5** From whom did you **FIRST** learn about conservation easements? **Select one response.**

<input type="radio"/> Never heard of before	<input type="radio"/> I don't remember
<input type="radio"/> Spouse	<input type="radio"/> Producer group
<input type="radio"/> Relative	<input type="radio"/> Professional consultant
<input type="radio"/> Neighbor	<input type="radio"/> Extension staff
<input type="radio"/> Land trust	<input type="radio"/> Government agency
<input type="radio"/> Soil and water conservation district	<input type="radio"/> Other: _____
<input type="radio"/> Watershed council	
<input type="radio"/> Environmental organization	

**6** Do you have experience with conservation easements? **Select one response.**

<input type="radio"/> I have a conservation easement on my land	<input type="radio"/> I have considered a conservation easement for my land	<input type="radio"/> I don't have any experience with conservation easements
-----------------------------------------------------------------	-----------------------------------------------------------------------------	-------------------------------------------------------------------------------

**7** Do you know someone who has experience with conservation easements? *Select one response.*

- Someone I know has a conservation easement on their land
  Someone I know has considered a conservation easement for their land
  I don't know of anyone who has experience with conservation easements

**8** Do you know of a local land trust?

- Yes  
 No

If yes, please list one or two names of land trusts you know of.

**9** Before reading this questionnaire, how aware were you of the following characteristics of conservation easements? *Select one response for each.*

Conservation easements...	Very Aware	Aware	Moderately Aware	Slightly Aware	Not At All Aware
Limit the uses of a property (typically development) that negatively impact conservation values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can be applied to the entire property or a portion of it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do not require public access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Give the right to monitor and enforce property restrictions to an eligible entity such as a land trust	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Are completely voluntary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keep land in private ownership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
May provide a financial benefit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**10** Please indicate how much you agree or disagree with the following statements about conservation easements. *Select one response for each.*

Conservation easements...	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Protect fish and wildlife habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance local natural resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allow landowners to leave a legacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide adequate financial incentives for landowners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect land from development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect the cultural significance of the lands they are placed on	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect open space and scenic values of the lands they are placed on	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect agricultural and forestry uses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect and/or enhance stream quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**2**

Your responses will be kept confidential

**11** In general, how much do you agree or disagree with the following statements about placing a conservation easement on your property? *Select one response for each.*

Placing a conservation easement on my property would be...	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Good for fish and wildlife habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inconvenient for my heirs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Useful to protect my land from development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wise for me financially	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy for me and my family to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incompatible with how I currently manage my land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Important for my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expensive for me and my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**12** We asked a few conservation professionals in Oregon to rate the level of risk a landowner may face when placing a conservation easement on their property. Below is a summary of what these experienced people thought.

Risk of...	
Future regulatory burdens	<b>VERY LOW</b>
Causing difficulty in the future sale of the property	<b>LOW</b>
Taking land out of production	<b>VERY LOW</b>
Resulting in the loss of privacy	<b>LOW</b>
Creating issues with neighboring landowners	<b>LOW</b>
Decreasing county property tax revenue	<b>LOW</b>
Reducing amount of land in private ownership	<b>VERY LOW</b>

**A** Please indicate the level of risk that *you* think landowners face when placing a conservation easement on their property. *Select one response for each.*

Risk of...	Very High	High	Unsure	Low	Very Low
Future regulatory burdens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Causing difficulty in the future sale of the property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking land out of production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resulting in the loss of privacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating issues with neighboring landowners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decreasing county property tax revenue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reducing amount of land in private ownership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**B** If you responded "Very High" or "High" for any of the above items, please explain why you think there is a high level of risk.

- 13** In general, how likely or unlikely would you be to place a conservation easement on your property? **Select one response.**
- Very Likely     Likely     Neither Likely nor Unlikely     Unlikely     Very Unlikely

- 14** Assuming you were considering a conservation easement, how likely or unlikely is it that you would place a conservation easement on your property under the following conditions? **Select one response for each.**

	Very Likely	Likely	Neither Likely nor Unlikely	Unlikely	Very Unlikely
If you had to pay for the costs associated with placing a conservation easement on your property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If there were no financial costs or benefits to you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you received a property tax benefit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you received an estate tax benefit that minimized burden for your heirs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you received an income tax benefit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you were paid for the value of the conservation easement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you were offered property rights assurances to guarantee no additional regulatory burdens would arise as a result of your conservation easement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you were asked to make a donation to support the land trust's management of the conservation easement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Land Management and You



We are also interested in learning about your familiarity with select land management practices and behaviors. Your answers will help us understand the current use of land in the watershed.

- 15** Please check the box on the left if you or someone you know is currently doing any of the following land management practices. Then, for all of the management practices, please indicate your level of experience with that practice on the right.

I am currently doing this	Someone I know is doing this		No experience or knowledge	I have some experience	I have a lot of experience
<input type="checkbox"/>	<input type="checkbox"/>	Controlling invasive species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="checkbox"/>	Thinning forest to reduce wildfire risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="checkbox"/>	Improving irrigation efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="checkbox"/>	Planting native vegetation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="checkbox"/>	Developing a written land management plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="checkbox"/>	Installing vegetative buffers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="checkbox"/>	Participating in federal land reserve programs (e.g. CRP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="checkbox"/>	Restoring aquatic habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**4**

**16** In the next five years, how likely or unlikely is it that you would implement the following management practices on your land? *Select one response for each.*

	Very Likely	Likely	Neither Likely nor Unlikely	Unlikely	Very Unlikely
Control for invasive species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thin forest to reduce wildfire risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve irrigation efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plant native vegetation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop a written land management plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Install vegetative buffers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enroll in land reserve program (e.g. CRP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restore aquatic habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**17** How often do you take part in the following types of behaviors? *Select one response for each.*

	Never	Annually	Every Few Months	Monthly	Every Few Weeks	Weekly	More than Once a Week
Volunteer with a land trust	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Steward or care for protected natural areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help a neighbor with the management of their land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work with an organization to restore your land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**18** When making decisions about your land, how important are the following factors to you? *Select one response for each.*

	Very Important	Important	Moderately Important	Slightly Important	Not At All Important
Protecting the open space and scenic qualities of my property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhancing my community's natural resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leaving a legacy for future generations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing recreational opportunities for me and my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting my property from development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing income for me and my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting the cultural significance of my property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing a primary residence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting fish and wildlife habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting and/or enhancing stream quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**19** How supportive or unsupportive are the people in your community of the following land management practices? *Select one response for each.*

	Very Supportive	Supportive	Neither Supportive nor Unsupportive	Unsupportive	Very Unsupportive
Controlling for invasive species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing written land management plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving irrigation efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Placing conservation easement on property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thinning forest to reduce wildfire risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Installing vegetative buffers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in federal land reserve programs (e.g. CRP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restoring aquatic habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Your Community and You



The following questions ask about your feelings towards your community and your interactions with the people in your community. When you are answering these questions, please think about "your community" as specific to you and the interactions you have with people within or in regards to the Whychus Creek Watershed.

**20** How attached do you feel to each of the following places? *Select one response for each.*

	Extremely Attached	Very Attached	Moderately Attached	Slightly Attached	Not Attached
City of Sisters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whychus Creek Watershed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upper Deschutes Watershed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
City of Bend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Central Oregon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pacific Northwest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Western U.S.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**21** How much do you agree or disagree with the following statements about the importance of the Whychus Creek Watershed to you personally? *Select one response for each.*

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
It is my favorite place to be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As far as I am concerned, there are better places to be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is the best place for doing the things I enjoy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would enjoy the activities I undertake there just as well in another place	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It reflects the type of person I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I can really be myself when I am there	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I really miss it when I am away too long	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel happiest when I am there	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't really identify with the Whychus Creek Watershed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



- 22** How much do you agree or disagree with the following statements about the importance, to you personally, of your community within the Whychus Creek Watershed? *Think about "community" as specific to you and the interactions you have with people within the Whychus Creek Watershed. Select one response for each.*

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I can get what I need in my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel connected to my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like a member of my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a good bond with others in my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a say about what goes on in my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in my community are good at influencing each other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My community helps me fulfill my needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I belong in my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 23** How often do you talk to your neighbors about the following items? *Select one response for each.*

	Never	Annually	Every Few Months	Monthly	Every Few Weeks	Weekly	More than Once a Week
Use or management of your land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Future plans for your land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protection of the Whychus Creek Watershed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Land management programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation in general	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 24** What does *neighbor* mean to you? *Select the best response or provide your own definition in the box following "Other."*

- Only the people that live on the land next to me  
 People that live next to me, but also people a few houses down  
 People who live within a mile of me  
 People who live within two miles of me
- People that live in the same general community as me  
 Other:

- 25** How often do you take note of how your neighbor manages their land? *Select one response.*
- Never     Rarely     Sometimes     Often     All the time

- 26** How often have you specifically done something because of your neighbor's success with it? *Select one response.*
- Never     Rarely     Sometimes     Often     All the time

- 27** How often have you specifically avoided doing something because of your neighbor's failure with it? *Select one response.*
- Never     Rarely     Sometimes     Often     All the time

**28** How much do you trust land management information from the following individuals or institutions?  
**Select one response for each.**

	High Trust	Moderate Trust	A Little Trust	No Trust	Unsure
Spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Neighbors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Land trusts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Watershed councils	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Producer groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Professional consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extension staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil and water conservation districts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government agencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**29** When you are struggling with a difficult question or problem related to managing your land, please list the 3 or 4 people whose opinion you most respect. Please only list their first name and identify their affiliation or relation to you. *Example 1: John, Deschutes Soil and Water Conservation District.*  
*Example 2: Mary, Wife.*

Name	Affiliation	Name	Affiliation
1. <input type="text"/>	<input type="text"/>	3. <input type="text"/>	<input type="text"/>
2. <input type="text"/>	<input type="text"/>	4. <input type="text"/>	<input type="text"/>

**30** Have you ever received land management or conservation information from the following individuals or institutions?  
**Check all that apply.**

- |                                                               |                                                     |
|---------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Spouse                               | <input type="checkbox"/> Producer group             |
| <input type="checkbox"/> Relative                             | <input type="checkbox"/> Professional consultant    |
| <input type="checkbox"/> Neighbor                             | <input type="checkbox"/> Extension staff            |
| <input type="checkbox"/> Land trust                           | <input type="checkbox"/> Environmental organization |
| <input type="checkbox"/> Soil and water conservation district |                                                     |
| <input type="checkbox"/> Watershed council                    |                                                     |
| <input type="checkbox"/> Government agency                    |                                                     |

**31** Whose opinion do you think you would be most likely to follow when making a land management or conservation decision?  
**Select one response.**

- |                                                            |                                                  |
|------------------------------------------------------------|--------------------------------------------------|
| <input type="radio"/> Spouse                               | <input type="radio"/> Producer group             |
| <input type="radio"/> Neighbor                             | <input type="radio"/> Professional consultant    |
| <input type="radio"/> Relative                             | <input type="radio"/> Extension staff            |
| <input type="radio"/> Land trust                           | <input type="radio"/> Environmental organization |
| <input type="radio"/> Soil and water conservation district | <input type="radio"/> Government agency          |
| <input type="radio"/> Watershed council                    |                                                  |

## More About You



Please tell us a little bit more about yourself. Remember, your responses are confidential.

**32** Approximately how many months of the year do you live in the Whychus Creek Watershed?  
 Less than 4 months       4-9 months       More than 9 months

**8**

Your responses will be kept confidential

**33** What is the highest level of education that you have completed? **Select one response.**

Less than a high school degree                       2 year college degree  
 High school degree or GED                               4 year college degree  
 Some college                                                       Advanced degree (Masters, J.D., M.D., Ph.D.)

**34** In the foreseeable future, do you anticipate that you will continue to own your property in the Whychus Creek Watershed?

Yes       No       Unsure

**35** What is your gender?

Male  
 Female

**36** In what year were you born?

\_\_\_\_\_

**37** Please rate whether you consider your political views to be more conservative or more liberal. **Select one response.**

Very Conservative       Somewhat Conservative       Neither Conservative nor Liberal       Somewhat Liberal       Very Liberal

**38** Which of the following best describes your household's 2014 pre-tax annual income? **Select one response.**

Less than \$15,000                       \$35,000- \$49,999                       \$100,000- \$149,999  
 \$15,000- \$24,999                       \$50,000- \$74,999                       \$150,000- \$199,999  
 \$25,000- \$34,999                       \$75,000- \$99,999                       \$200,000 or more

If you would like, please use the space below and on the back cover to write any other opinions or thoughts you may have about topics covered in this questionnaire (optional):

**Your responses will be kept confidential**

# Summary Report

*A Survey About You and Your Land: Whychus Creek Watershed  
Private Landowner Attitudes and Interest in Conservation Easements*

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**January 2016**

**Ashley Vizek**  
*Environmental Science and Management  
Portland State University*



*Wychus Creek at Deschutes Land Trust's Camp Polk Meadow Preserve. Photo: Deschutes Land Trust/Russ McMillan*

## ACKNOWLEDGEMENTS

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*This report was prepared by Ashley Vizek, a graduate student at Portland State University, advised by Max Nielsen-Pincus, PhD, Assistant Professor at Portland State University.*

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*Cover photograph provided by Deschutes Land Trust/Russ McMillan.*

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I am very grateful to the many people that helped develop, edit and review the survey instrument.

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## A LETTER OF MANY THANKS

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Dear Survey Respondents,

I would like to express my gratitude for your time in responding to my survey. Thank you for taking an interest in this research project and for sharing your opinions. I am conducting this project as part of my thesis, thus I am personally grateful to you in helping me towards my goal of obtaining a graduate degree.

As of November 1, 2015, I received 257 responses both through the mail and online. Each and every one of these responses is important in helping me to address the research objectives of my project. I valued the experience of reading through each response and entering the data as it provided an opportunity to connect with the respondent. I appreciated the opportunity to learn about each unique perspective.

In order to maintain confidentiality, the report that follows is a preliminary data summary of your responses. Although this report may not present each individual and unique story, it does weave together a larger perspective composed of many different landowners.

I am extremely grateful to you for participating in this survey. The survey was lengthy and detailed, and I sincerely appreciate you taking the time to share your perspective. I hope the following report will be interesting to you.

Sincerely,

*Ashley Vizek*

M.S. Graduate Student

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## EXECUTIVE SUMMARY

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Private land provides valuable ecological and cultural resources while also supplying open space and scenic views. Unfortunately, private land is vulnerable to development and subdivision, presenting a need to conserve our remaining private lands. Conservation easements (CEs) emerged in the 1980s as a popular approach to private land conservation. A CE is a legal agreement between a landowner and an eligible organization, such as a land trust or government agency. This agreement is tailored to meet both the goals of the conservation organization and the landowner. CEs are powerful voluntary conservation tools that allow land to remain in private ownership. CEs, and private land conservation in general, are dependent on the decisions of private landowners; therefore, it is necessary to gain a better understanding of the factors impacting a landowner's decision to place a CE on their property.

My thesis research at Portland State University explores landowner perceptions of CEs focusing on how information, attitudes, social interactions and place connections influence private land conservation actions. In order to address these questions, I distributed a questionnaire to private landowners in the Whychus Creek Watershed (Deschutes County, Oregon) during the summer of 2015. The questionnaire asked about landowners' interest in conserving the natural qualities of their land through the use of CEs and select land management practices.

As of November 1, 2015 I received 257 responses, yielding a response rate of 41%. Survey respondents were older than 50 years of age and, in comparison to the general population, had a higher level of education and above-average income. Most survey respondents specified that they use their property as a primary residence and live on their property more than nine months out the year. There was a wide range of property sizes ranging from less than one acre to greater than 2,000 acres. The report that follows summarizes the survey responses from this sample of landowners.

Additionally, this report includes an exploration of the differences between respondents who were likely, unlikely or unsure about placing a CE on their property<sup>1</sup>. Survey respondents who said they were *Likely* or *Very Likely* formed the Yes Group (n=43), those that said *Neither Likely nor Unlikely* formed the Maybe Group (n=95) and those that said *Unlikely* or *Very Unlikely* formed the No Group (n=119).

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<sup>1</sup>Respondents were categorized into three groups based on their response to Q13 of the survey—*In general, how likely or unlikely would you be to place a conservation easement on your property?*



## Key Findings

**Place Connections** | When asked about how they connected to the Whychus Creek Watershed, more respondents had a positive connection than a negative connection. Respondents reported a high emotional connection to the Watershed as well as high self-identification to the Watershed. Conversely, respondents reported a lower level of behavioral dependence on the Watershed. Respondents in the Yes Group were more positively connected to the Watershed than respondents in the No and Maybe Groups. Consistent with past research, this suggests that there may be a link between sense of place and likelihood of adopting a CE (Cross et al. 2011, Vaske and Kobrin 2010). Respondents also had a positive connection to their social community in the Whychus Creek Watershed. They reported high levels of membership and emotional connection to their community, but reported much lower levels of having an influence in their community.

**Awareness of CEs** | Survey respondents were moderately aware of CEs; over 60% of respondents said they knew at least a little about CEs. Respondents in the Yes Group showed the highest levels of awareness, whereas the Maybe Group showed the lowest levels of awareness. Awareness of CEs may be a limiting factor for landowners in the Maybe Group.

**Beliefs about CEs and Attitudes towards CEs** | In general, survey respondents held positive beliefs about the characteristics of CEs. However, the majority of respondents were unsure if CEs provide adequate financial incentives. Most survey respondents expressed neutral attitudes towards CEs. The Yes Group held the most positive attitudes towards CEs, while the No Group held the most negative attitudes.

**Information Sources** | The top five sources that respondents received land management information from included 1) land trusts, 2) government agencies, 3) neighbors, 4) environmental organizations and 5) soil and water conservation districts. Landowners were also asked how much they trusted land management information from these various institutions and individuals. The top five *highly trusted* information sources included 1) spouse, 2) land trusts, 3) watershed councils, 4) relatives and 5) environmental organizations. When asked who were the three or four individuals or institutions whose opinion they would most respect when struggling with a difficult land management problem, 21% of the responses were neighbors, 17% were spouses, 17% were affiliated with a government agency and 10% were friends. However, when asked to list the one opinion they would be most likely to follow the top three included 1) spouse, 2) land trusts and 3) professional consultants.

**Perceived Risk and Advantages of CEs** | Survey respondents rated future regulatory burdens and causing difficulty in the future sale of a property as the largest risks associated with CEs. However, those risks

appeared to be outweighed by a number of potential benefits. When asked how likely or unlikely they were to place a CE on their property in general, 13% reported that they were *Likely* or *Very Likely*. The percentage of respondents who were *Likely* or *Very Likely* to place a CE on their property increased from 13% to approximately 50% if they were offered 1) a property tax benefit, 2) an estate tax benefit, 3) property rights assurances to guarantee no additional burden would arise as a result of the CE or 4) paid the value of the CE. The overall percentage of respondents who were *Likely* or *Very Likely* did not change if there were no financial costs or benefits to the landowner or if the landowner was asked to make a donation to support the land trust's management of the CE.

## SECTION ONE

# Introduction

---

Land protection in the United States has historically been achieved through the outright acquisition of land by public agencies. While public reserves provide varying levels of protection from land use change, these reserves may not protect the land with the greatest biodiversity. Preferred habitat for between 90-95% of federally threatened and endangered species is on private land (Scott et al. 2001). Despite the ecological importance of private land, there has been a dramatic increase in development on private land (Brown et al. 2005). Rural and low-density communities near public natural areas have become an appealing option for development as people seek quality-of-life and outdoor recreational opportunities (Maestas et al. 2001), presenting an urgency to incorporate private lands in natural area conservation.

In the 1980s, conservation easements (CEs), although not a new idea, emerged as an innovative method of protecting private land. CEs are attached to the property deed, meaning that significant conservation values of a piece of land can be permanently protected. A CE is an individually-crafted voluntary legal agreement between a landowner and land trust (a non-profit organization that works to protect land) or government agency. When a landowner decides to place a CE on their property, they continue to own the property, but uses and/or management practices that would negatively affect the conservation values are limited or prohibited. CEs are now a popular tool used by land trusts across the U.S. to protect habitat, agricultural and forestry uses, biodiversity and open space (Kiesecker et al. 2007).

For my M.S. thesis research I was interested in exploring private landowners' awareness of and attitudes towards CEs to better understand how CEs can be further utilized in private land conservation. This research project focused on one study area—the Whychus Creek Watershed in Deschutes County, Oregon. The objectives of this research project were to:

- Determine private landowners' familiarity with and attitudes towards CEs;
- Understand the advantages and risk that landowners perceive to be associated with CEs;
- Evaluate the role of community and social connections in developing an awareness of and interest in CEs;
- Identify private landowners' likelihood of placing a CE on their property.

*This report summarizes responses to the questionnaire titled "A Survey About You and Your Land: Whychus Creek Watershed" implemented to address the research objectives presented above.*

## Study Area and Methods

Whychus Creek (Deschutes County, Oregon) provided an appropriate and interesting study area to investigate my research objectives for two primary reasons: 1) private land conservation is particularly relevant in this area due to the ownership pattern of private land surrounded by public land (Figure 1.1) and 2) there is an extensive history of conservation and restoration efforts in the area.

Deschutes County has been experiencing increases in population and is one of the fastest growing counties in Oregon. The area surrounding Whychus Creek may be especially vulnerable to increases in development as the area is situated between public protected land, offering outdoor recreational opportunities, and Whychus Creek, an attractive and valuable quality-of-life resource. Therefore, private land conservation is a useful tool in the Whychus Creek area as it maintains land in private ownership while also protecting valuable ecological resources. Additionally, Whychus Creek presents an interesting case study due to the presence of well-developed conservation interests in the area, exemplified through an extensive history of conservation and restoration activity. Interest in restoring Whychus Creek gained momentum in the 1990s when many private and public entities began collaborating to restore aquatic and terrestrial habitat in order to address water allocation issues and potential federal regulation under the Endangered Species Act. This initial effort has developed into an established suite of private organizations, public agencies and landowners who continue to conserve and restore Whychus Creek.

The boundaries of the study area used in this research project reflect the boundaries of the Whychus Creek Watershed. A watershed can be defined as an area of land within which all water drains to the same place. Therefore, by using the watershed boundaries to delineate the study area each parcel of land within the study area is connected to Whychus Creek. I randomly selected a sample of private landowners within the Whychus Creek Watershed based on a few criteria, which included that:

- Landowners were private individuals, trusts or family businesses; not industrial or corporate landowners;
- Landowners owned more than five acres, unless they owned property directly adjacent to the creek or next to property that had been previously protected.

Participants were recruited using the Tailored Design Method (Dillman 2000), which consisted of a four contact mailing approach offering both a web and paper survey instrument. Mailings were administered between July and September 2015. As of November 1, 2015 I received 257 responses yielding a response rate of 41%.

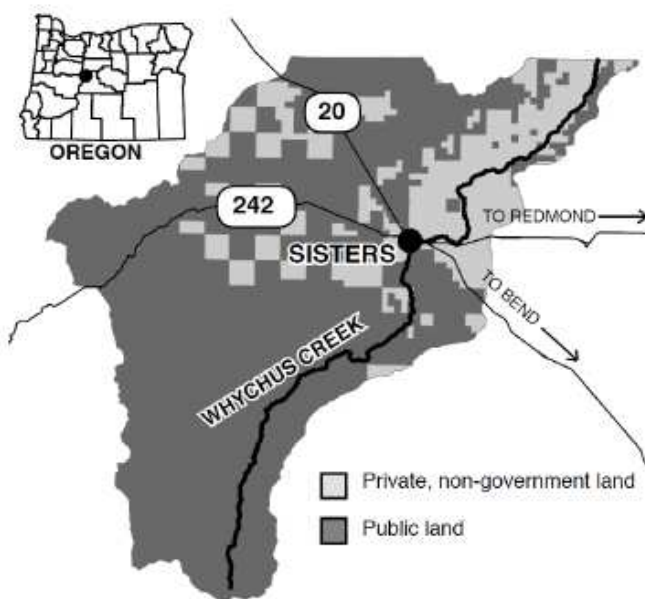


Figure 1.1 Map of the Whychus Creek Watershed

## Organization of this Report

The remainder of this report presents a summary of the survey results, based on the 257 responses received as of November 1, 2015. The report is organized into four main sections, reflecting the structure of the questionnaire. Each section of the report includes a written summary of the responses and, where appropriate, a descriptive table and graph. Each of the graphs presented in Section Three, Four and Five show the cumulative percentage of positive, neutral and negative responses<sup>1</sup>.

- Section Two describes demographic characteristics of the survey respondents in comparison to the general population in the Whychus Creek Watershed.

<sup>1</sup>For example, if a survey question asked a respondent to rate how much they agree or disagree with a statement on the five point scale of *Strongly Agree* to *Strongly Disagree*, the graph would show the percentage of respondents who agreed (grouping *Strongly Agree* and *Agree* responses), neither agreed nor disagreed and those who disagreed (grouping *Strongly Disagree* and *Disagree* responses).

- **Section Three** summarizes responses to questions in the *Conservation Easements and You* section of the survey. These questions asked respondents about their familiarity, beliefs and attitudes towards CEs. In this section, respondents were also asked how likely they were to place a CE on their property in general and under specific situations.
- **Section Four** summarizes responses to questions in the *Land Management and You* section of the survey. These questions asked respondents about their experience with select land management practices and their likelihood to implement these practices on their property.
- **Section Five** summarizes responses to questions in the *Your Community and You* section of the survey. These questions asked respondents about their connection to the social community and physical environment of the Whychus Creek Watershed.
- **Section Six** presents a more in-depth analysis and interpretation of the survey responses by comparing different groups of landowners based on their likelihood of placing a CE on their property. This section does not follow a question-by-question format as the previous sections, but instead highlights the key findings.

An index of figures and tables can be found in Appendix A. Appendix B contains a copy of the survey titled, “**A Survey About You and Your Land: Whychus Creek Watershed**” for reference. Within the sections above I note which question you should refer to for original question wording and formatting.

SECTION TWO

## Demographics of Survey Respondents

In this section I describe the general characteristics of survey respondents based on their responses to questions in the *Your Land and You* and *More About You* section of the survey. Survey question numbers are listed in figure captions and can be referenced in Appendix B.

Additionally, to understand areas of potential bias I compared, where possible, demographics of respondents to U.S. Census Data. I used U.S. Census Data from the 2013 American Community Survey for the census blocks that composed the Whychus Creek Watershed, excluding the City of Sisters. I was unable to specify the U.S. Census Data for *only* private landowners, thus, I expected there to be some differences between the survey respondents and the U.S. Census Data.

### Age and Gender

Q36. The average age of survey respondents was 64.5 years (n=221). Figure 2.1 shows the percentage of survey respondents within each age group compared to the general population in the Whychus Creek Watershed based on the U.S. Census Data. Respondents younger than 40 were not represented and the age groups between 60 and 79 were overrepresented. While survey respondents were older than the general population, this is not unprecedented. The National Woodland Owner Survey found a similar age distribution, where most family forest owners were older than 45 (Butler 2006).

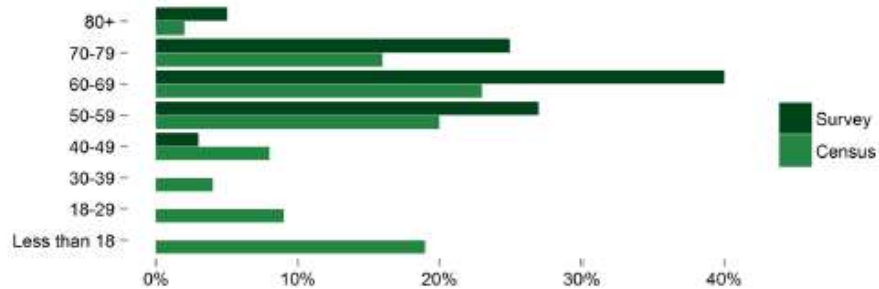


Figure 2.1 [Q36] Age of survey respondents and the general population of the Whychus Creek Watershed (n=221)

**Q35.** Males accounted for 62% of the respondents, whereas, females accounted for 38% of the respondents (n=235). In comparison, the general population in the Whychus Creek Watershed was comprised of 53% males and 47% females. The gender distribution of survey respondents is consistent with other surveys of private landowners, such as the National Woodland Owner Survey (Butler 2006).

### Property in the Whychus Creek Watershed

**Q1.** The average number of years that survey respondents have owned property in the Watershed was 18.3 years (n=256). The length of ownership ranged from less than one year to 65 years and the median length of ownership in the Watershed was 15 years.

**Q2.** Respondents' average property size was 39.1 acres (n=257). Acreage owned by survey respondents ranged from less than one acre to over 2,000 acres and the median property size was ten acres.

**Q32.** Most respondents (68%) specified that they live on their property for more than nine months out of the year; 9% live on their property between four and nine months and 28% live on their property less than four months out of the year (n=240).

**Q3.** Most respondents (69%) reported that they use their property for a primary residence (Figure 2.2); 21% use their property for recreational uses; 16% for "other" uses which included investment purposes and future development; 13% use their property for timber or forestry purposes; 9% use their property as a second home or vacation property; 8% use their property for ranching and 6% use their property for farming.

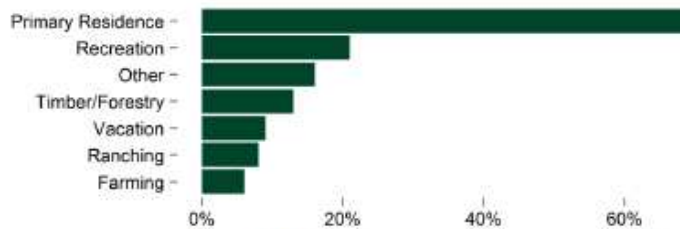


Figure 2.2 [Q3] Primary use of survey respondents' property (n=257)

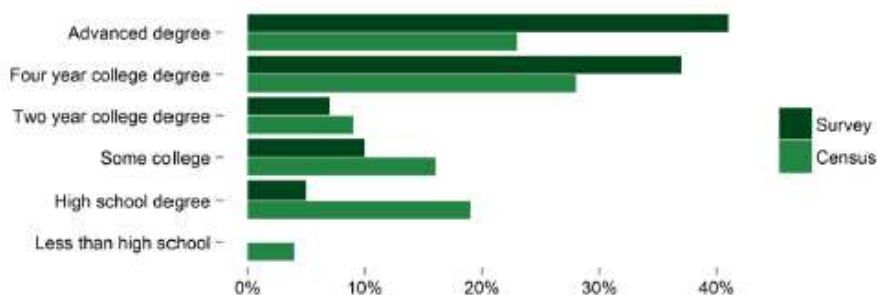
### Political Views

**Q37.** Political views were evenly distributed across conservative and liberal perspectives (n=228). Many survey respondents (31%) considered their political viewpoints to be *Somewhat Conservative*, while 10% reported *Very Conservative* political views. 26% of respondents reported *Somewhat Liberal* political views and 15% reported *Very Liberal* political views. 18% reported that their views were *Neither Conservative nor Liberal*.



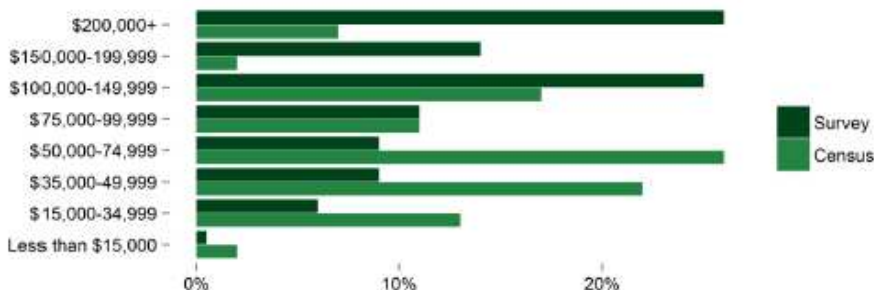
## Education and Income

**Q33.** The survey sample is most representative of a highly educated population of landowners as the majority of respondents reported obtaining at least a four year college degree. Figure 2.3 shows the highest level of education completed by survey respondents (n=238) in comparison to the general population in the Whychus Creek Watershed. Education levels below a two year college degree were underrepresented in comparison to the general population.



*Figure 2.3 [Q33] Highest level of education completed by survey participants and the general population of the Whychus Creek Watershed (n=238)*

**Q38.** Figure 2.4 shows the income distribution of survey respondents (n=203) in comparison to the general population in the Whychus Creek Watershed. Many survey respondents (26%) reported an annual household income of more than \$200,000 for 2014. The income range with the next highest percentage of respondents (25%) was between \$100,000 and \$149,999. Income ranges below \$75,000 were not well-represented by the survey. The National Woodland Owner Survey also found that landowners were wealthier than the general population (Butler 2006).



*Figure 2.4 [Q38] Survey respondents' household income in comparison to the general Whychus Creek Watershed population (n=203)*

SECTION THREE

## Conservation Easements and You

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This section summarizes the responses to questions in the *Conservation Easements and You* section of the survey. These questions asked respondents about their familiarity with and awareness of conservation easements (CEs). Additionally, respondents were asked about their beliefs and attitudes towards CEs. This section also contained questions about the amount of risk respondents perceived to be associated with CEs and respondents' likelihood of placing a CE on their property.

### Familiarity with Conservation Easements

*Q4. How much do you know about conservation easements? (n=255)*

- 15% of respondents had never heard of a CE before reading the questionnaire
- 23% heard of a CE, but know very little
- 37% of respondents know a little about CEs
- 20% know quite a bit about CEs
- 5% know a great deal about CEs

*Q5. From whom did you FIRST learn about conservation easements? Select one response. (n=255)*

The top five responses included 1) land trust (26%), 2) other (21%), of which the most common description was "media/newspaper", 3) don't remember (19%), 4) never heard of before reading this survey (16%) and 5) neighbor (6%).

*Q6-7. Do you have experience with conservation easements? Do you know someone who has experience with conservation easements? Select one response. (n=248)*

17% had either considered or completed a CE (Table 3.1). The majority of respondents specified that they do not know anyone who has experience with CEs (62%), while 38% responded that they know someone who has considered or completed a CE.

*Table 3.1 [Q6-7] Personal and indirect experience with conservation easements (n=248)*

	No Experience	Considered CE	Completed CE
<i>Q6. Personal Experience</i>	83%	11%	6%
<i>Q7. Indirect Experience</i>	62%	7%	31%

**Q8. Do you know of a local land trust? If yes, please list one or two names of the land trusts you know of. (n=250)**

- 20% of respondents did not know of a local land trust
- 16% knew of a local land trust, but did not provide a name
- 4% knew of a local land trust, but listed only a partially correct name
- 60% of respondents knew of a local land trust and listed an accurate name (the most frequently listed name was the "Deschutes Land Trust")

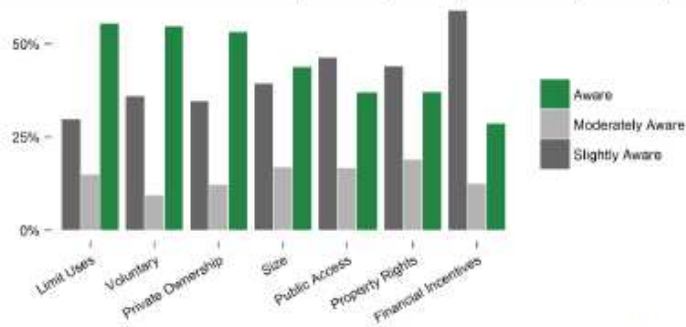
### Awareness of Conservation Easements

**Q9. Before reading this questionnaire, how aware were you of the following characteristics of conservation easements? Select one response for each.**

Respondents were most aware that CEs 1) limit the use of the property they are placed on, 2) are voluntary and 3) keep land in private ownership (Table 3.2, Figure 3.1). Respondents showed low levels of awareness that CEs 1) do not require public access, 2) give the right to monitor and enforce property restrictions to an eligible entity and 3) may provide a financial benefit.

**Table 3.2 [Q9] Awareness of the characteristics of conservation easements (n=245-249)**

Conservation easements...	Very Aware	Aware	Moderately Aware	Slightly Aware	Not At All Aware	n
<i>Limit Uses: Limit the uses of a property (typically development) that negatively impact conservation values</i>	29%	26%	15%	12%	18%	249
<i>Voluntary: Are completely voluntary</i>	26%	29%	9%	10%	26%	245
<i>Private Ownership: Keep land in private ownership</i>	22%	31%	12%	9%	26%	246
<i>Size: Can be applied to the entire property or a portion of it</i>	18%	26%	17%	10%	29%	249
<i>Financial Incentives: May provide a financial benefit</i>	15%	14%	13%	12%	46%	248
<i>Property Rights: Give the right to monitor and enforce property restrictions to an eligible entity such as a land trust</i>	13%	24%	19%	15%	29%	248
<i>Public Access: Do not require public access</i>	12%	25%	17%	11%	35%	246



**Figure 3.1 [Q9] Awareness of conservation easements (n=245-249)**

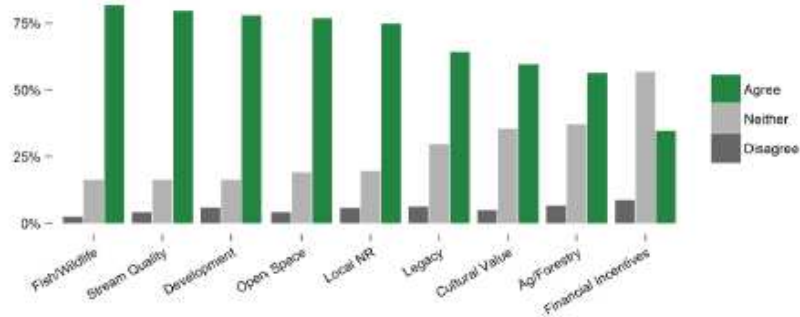
## Beliefs about Conservation Easements

*Q10. Please indicate how much you agree or disagree with the following statements about conservation easements. Select one response for each.*

In general, respondents agreed with all the statements about CEs (Figure 3.2, Table 3.3). The items which respondents agreed with the least included 1) provide an adequate financial incentive, 2) protect the cultural value of the lands they are placed on and 3) protect agricultural and forestry uses.

**Table 3.3 [Q10] Beliefs about conservation easements (n=243-245)**

Conservation easements...	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	n
<i>Fish/Wildlife: Protect fish and wildlife habitat</i>	36%	45%	16%	2%	1%	245
<i>Development: Protect land from development</i>	35%	43%	16%	5%	1%	245
<i>Open Space: Protect the open space and scenic values of the lands they are placed on</i>	33%	44%	19%	4%	0%	246
<i>Stream Quality: Protect and/or enhance stream quality</i>	33%	47%	16%	3%	1%	245
<i>Local NR: Enhance local natural resources</i>	31%	43%	20%	5%	1%	246
<i>Legacy: Allow landowners to leave a legacy</i>	24%	40%	30%	5%	1%	243
<i>Cultural Value: Protect the cultural significance of the lands they are placed on</i>	23%	37%	35%	4%	1%	245
<i>Ag/Forestry: Protect agricultural and forestry uses</i>	15%	41%	37%	5%	2%	245
<i>Financial Incentives: Provide adequate financial incentives</i>	8%	26%	57%	5%	4%	245



**Figure 3.2 [Q10] Beliefs about conservation easements (n=243-245)**

## Attitudes towards Conservation Easements

*Q11. In general, how much do you agree or disagree with the following statements about placing a conservation easement on your property?*

In general, respondents did not have strong attitudes towards CEs (Figure 3.3), except in terms of three items: 1) good for fish and wildlife habitat, 2) convenient for my heirs and 3) useful to protect my land from development (Table 3.4).

Table 3.4 [Q11] Attitudes towards conservation easements (n=242-245)

Placing a conservation easement on my property would be...	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	n
Fish/Wildlife: Good for fish and wildlife habitat	18%	33%	28%	14%	7%	244
Development: Useful to protect my land from development	11%	33%	32%	16%	8%	243
*Heirs: Convenient for my heirs	8%	12%	39%	33%	8%	242
*Compatible: Compatible with how I currently manage my land	8%	25%	42%	18%	7%	244
*Inexpensive: Inexpensive for me and my family	7%	15%	63%	14%	1%	245
Community: Important for my community	6%	26%	51%	11%	6%	245
Financial Benefit: Wise for me financially	2%	8%	66%	15%	9%	244
Easy: Easy for me and my family to do	1%	15%	64%	15%	5%	242

\*Note that the original question items were on opposite scales and were inverted for ease of comparison.

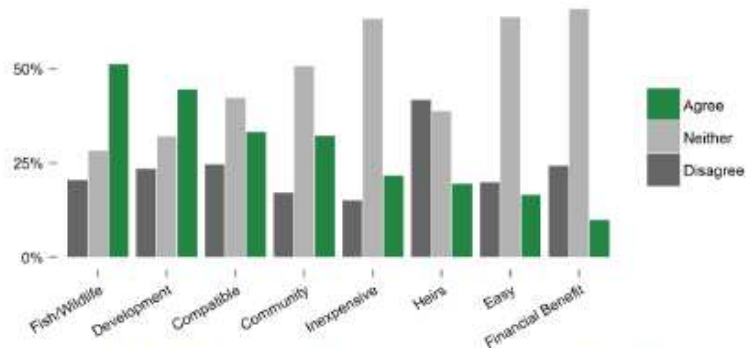


Figure 3.3 [Q11] Attitudes towards conservation easements (n=242-245)

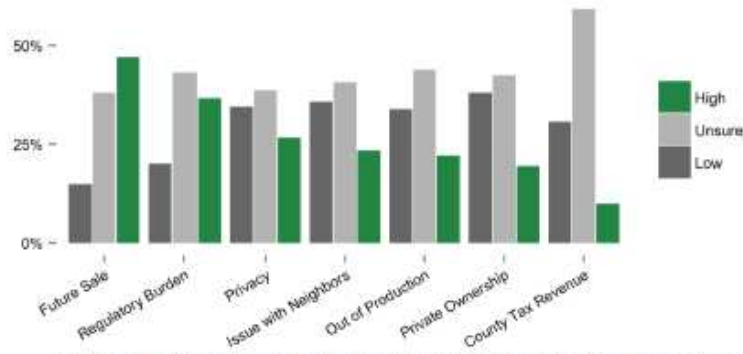
### Risk and Conservation Easements

**Q12.** Please indicate the level of risk that you think landowners face when placing a conservation easement on their property. Select one response for each.

The three items with the highest levels of perceived risk included 1) future regulatory burdens, 2) causing difficulty in the future sale of the property and 3) resulting in the loss of privacy (Figure 3.4). The item with the lowest amount of perceived risk was "decreasing the county property tax revenue" (Table 3.5). Respondents also perceived a low risk of 1) taking land out of production, 2) creating issues with neighbors and 3) reducing the amount of land in private ownership.

**Table 3.5 [Q12] Perceived risk to landowners when placing conservation easement on property (n=239-243)**

Risk of...	Very High	High	Unsure	Low	Very Low	n
<i>Future Sale: Causing difficulty in the future sale of the property</i>	17%	30%	38%	14%	1%	242
<i>Regulatory Burden: Future regulatory burdens</i>	14%	23%	43%	16%	4%	243
<i>Privacy: Resulting in the loss of privacy</i>	12%	15%	39%	29%	5%	243
<i>Out of Production: Taking land out of production</i>	9%	13%	44%	23%	11%	239
<i>Issue with Neighbors: Creating issues with neighboring landowners</i>	8%	15%	41%	30%	6%	243
<i>Private Ownership: Reducing the amount of land in private ownership</i>	8%	11%	43%	23%	15%	242
<i>County Tax Revenue: Decreasing county property tax revenue</i>	6%	4%	59%	24%	7%	241

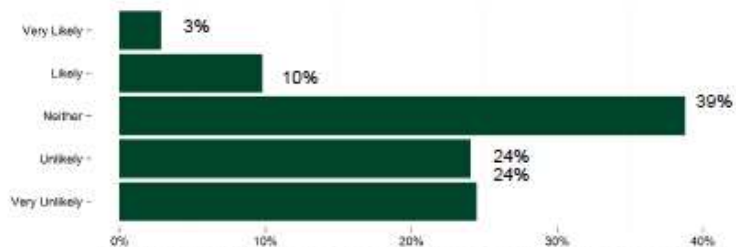


**Figure 3.4 [Q12] Perceived risk to landowners when placing conservation easement on property (n=239-243)**

### Interest in Conservation Easements

**Q13. In general, how likely or unlikely would you be to place a conservation easement on your property? Select one response. (n=245)**

This was an important question to evaluate respondents' interest in CEs. Section Six provides a closer look at the differences amongst those who answered 1) *Very Likely* or *Likely*, 2) *Neither Likely nor Unlikely* and 3) *Very Unlikely* or *Unlikely*.



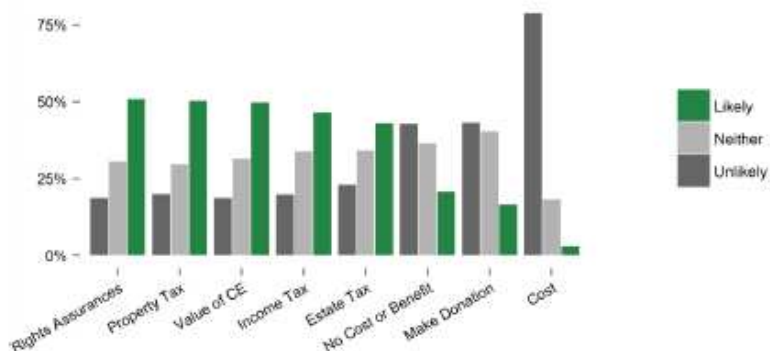
**Figure 3.5 [Q13] Likelihood of placing a conservation easement on their property (n=245)**

**Q14.** Assuming you were considering a conservation easement, how likely or unlikely is it that you would place a conservation easement on your property under the following conditions? Select one response for each.

Respondents were unlikely to place a CE on their property if there was a cost associated it (Table 3.7). Respondents' likelihood increased if they were 1) paid the value of the CE, 2) offered a property tax benefit, 3) an estate tax benefit, 4) an income tax benefit or 5) given property rights assurances to guarantee that no additional regulatory burdens would arise as a result of the CE (Figure 3.6).

**Table 3.7 [Q14] Likelihood of placing a conservation easement on your property (n=235-237)**

	Very Likely	Likely	Neither Likely nor Unlikely	Unlikely	Very Unlikely	n
<i>Value of CE: If you were paid for the value of the conservation easement</i>	14%	35%	32%	8%	11%	235
<i>Income Tax: If you received an income tax benefit</i>	12%	34%	34%	10%	10%	237
<i>Rights Assurances: If you were offered property rights assurances to guarantee no additional regulatory burdens would arise as a result of your conservation easement</i>	12%	39%	30%	8%	11%	236
<i>Property Tax: If you received a property tax benefit</i>	11%	39%	30%	10%	10%	235
<i>Estate Tax: If you received an estate tax benefit that minimized burden for your heirs</i>	11%	31%	34%	12%	12%	235
<i>No Cost or Benefit: If there were no financial costs or benefits to you</i>	4%	17%	36%	26%	17%	236
<i>Make Donation: If you were asked to make a donation to support the land trust's management of the conservation easement</i>	2%	14%	40%	23%	21%	236
<i>Cost: If you had to pay for the costs associated with placing a conservation easement on your property</i>	1%	2%	18%	41%	38%	236



**Figure 3.6 [Q14] Likelihood of placing a conservation easement on your property under different situations (n=235-237)**

SECTION FOUR

Land Management and You

This section summarizes the responses to questions in the *Land Management and You* section of the survey. The questions asked landowners about their experience with select land management practices and their likelihood of implementing these practices in the next five years. Landowners were also asked how supportive they thought their community was of these practices. Additionally, this section included a question that asked respondents about important factors in their land management decisions.

Land Management Practices

*Q15. Please check the box on the left if you or someone you know is currently doing any of the following land management practices. Then, for all of the management practices, please indicate your level of experience with that practice on the right.*

Over 50% of respondents reported that they are currently controlling invasive species and thinning forest on their property to reduce wildfire risk (Table 4.1). Very few respondents have developed a management plan for their property or have participated in a federal land reserve program, which is also reflected in their level of experience with these practices.

Table 4.1 [Q15] Respondents' experience with management practices (n=190-211)

	Currently Doing This	Know Someone Doing This	n	No Experience	Some Experience	A lot of Experience	n
Controlling invasive species	61%	23%	246	18%	67%	14%	190
Thinning forest to reduce wildfire risk	54%	27%	246	23%	54%	23%	191
Planting native vegetation	46%	24%	244	34%	55%	11%	188
Improving irrigation efficiency	29%	18%	244	55%	35%	10%	179
Installing vegetative buffers	17%	12%	244	68%	26%	6%	198
Developing a written management plan	9%	10%	245	77%	17%	6%	211
Restoring aquatic habitat	9%	20%	244	69%	27%	4%	199
Participating in federal land reserve programs (i.e. CRP)	2%	7%	244	90%	10%	0%	209

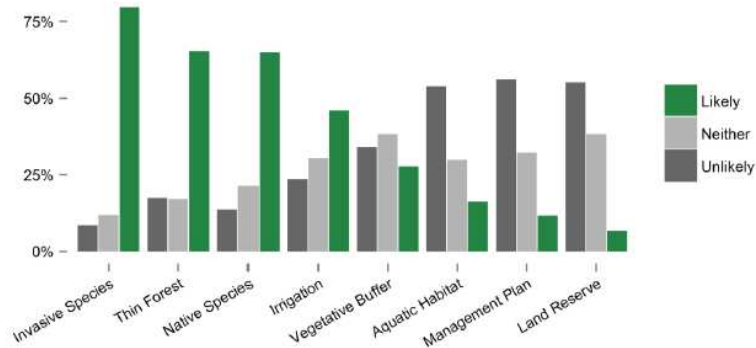
*Q16. In the next five years, how likely or unlikely is it that you would implement the following management practices on your land?*

Greater than 50% of respondents marked that they are likely to control for invasive species, thin forest to reduce wildfire risk and plant native vegetation on their property (Figure 4.1). Conversely, about 50% of respondents specified that they are unlikely to restore aquatic habitat, participate in a federal land reserve program and develop a written management plan.



**Table 4.2 [Q16]** Likelihood of implementing select management practices (n=234-246)

	Very Likely	Likely	Neither Likely nor Unlikely	Unlikely	Very Unlikely	n
Controlling invasive species	47%	33%	12%	5%	3%	246
Thinning forest to reduce wildfire risk	41%	24%	17%	12%	6%	246
Planting native vegetation	30%	35%	21%	8%	6%	243
Improving irrigation efficiency	23%	23%	30%	13%	11%	234
Installing vegetative buffers	10%	18%	38%	18%	16%	238
Developing a written management plan	6%	6%	32%	27%	29%	242
Restoring aquatic habitat	6%	10%	30%	26%	27%	234
Participating in federal land reserve programs	2%	5%	38%	26%	29%	238



**Figure 4.1 [Q16]** Likelihood of implementing select management practices (n=234-246)

**Q17.** How often do you take part in the following types of behaviors?

Most respondents marked that they *Never* partake in the listed behaviors, however, about 20% of respondents *Annually* steward/care for a protected natural area or help a neighbor with the management of their land (Table 4.3). About 10% of respondents steward/care for protected natural areas or help their neighbor with land management *Every Few Months*.

**Table 4.3 [Q16]** Frequency of performing specific conservation actions (n=244-246)

	Never	Annually	Every Few Months	Monthly	Every Few Weeks	Weekly	More than Once a Week	n
Work with an organization to restore your land	88%	8%	2%	0%	0%	0%	1%	246
Volunteer with a land trust	82%	13%	3%	0%	1%	0%	1%	245
Help a neighbor with the management of their land	69%	18%	10%	1%	1%	1%	0%	244
Steward or care for protected natural areas	68%	18%	7%	4%	2%	1%	0%	244

## Important Factors in Land Management Decisions

Q18. When making decisions about your land, how important are the following factors to you?

Over 75% of respondents considered protecting the open space and scenic qualities of their property and providing a primary residence as *Important* or *Very Important* (Figure 4.2). Over 50% of respondents considered enhancing their community's natural resources, leaving a legacy for future generations, providing recreational opportunities, protecting fish and wildlife habitat and stream quality as *Important* or *Very Important* when making decisions about their land. The least important factors to respondents included 1) providing an income and 2) protecting the cultural significance of their property (Table 4.5).

Table 4.4 [Q18] Important factors in land management decisions (n=235-248)

	Very Important	Important	Moderately Important	Slightly Important	Not at all Important	n
Open Space: Protecting the open space and scenic qualities of my property	76%	16%	6%	1%	1%	248
Residence: Providing a primary residence	64%	20%	7%	4%	5%	245
Development: Protecting my property from development	48%	20%	17%	6%	9%	246
Fish/Wildlife: Protection fish and wildlife habitat	37%	37%	15%	9%	2%	246
Stream Quality: Protecting and/or enhancing stream quality	35%	32%	20%	4%	9%	235
Local NR: Enhancing my community's natural resources	33%	35%	20%	9%	3%	248
Recreation: Providing recreational opportunities for me and my family	32%	32%	22%	8%	6%	246
Legacy: Leaving a legacy for future generations	30%	34%	23%	7%	6%	246
Cultural Values: Protecting the cultural significance of my property	14%	21%	29%	17%	19%	241
Income: Providing an income for me and my family	11%	21%	23%	18%	27%	245

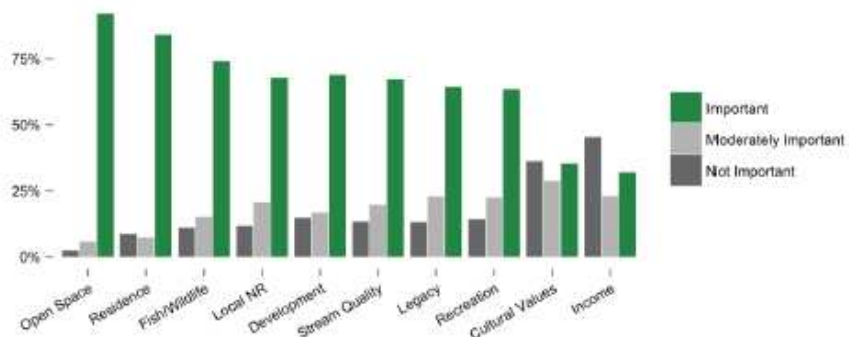


Figure 4.2 [Q18] Important factors in management decisions (n=235-248)

## Community Support for Land Management Practices

Q19. How supportive or unsupportive are the people in your community of the following land management practices?

Over 75% of respondents think people in their community are *Supportive* or *Very Supportive* of controlling invasive species, thinning forest to reduce wildfire risk, improving irrigation efficiency and restoring aquatic habitat (Table 4.5, Figure 4.3). Over 50% of respondents think their community is *Neither Supportive nor Unsupportive* of CEs, developing a written management plan and participating in federal land reserve programs.

Table 4.5 [Q19] Level of community support for select management practices (n=209-225)

	Very Supportive	Supportive	Neither	Unsupportive	Very Unsupportive	n
Thinning forest to reduce wildfire risk	32%	54%	11%	2%	0%	226
Controlling invasive species	28%	54%	15%	3%	0%	225
Restoring aquatic habitat	23%	45%	29%	3%	0%	221
Improving irrigation efficiency	15%	49%	30%	5%	1%	219
Installing vegetative buffers	9%	39%	45%	6%	1%	213
Developing a written management plan	7%	23%	61%	7%	1%	215
Placing conservation easement on property	5%	25%	55%	12%	3%	215
Participating in federal land reserve programs (i.e. CRP)	4%	19%	67%	7%	2%	209

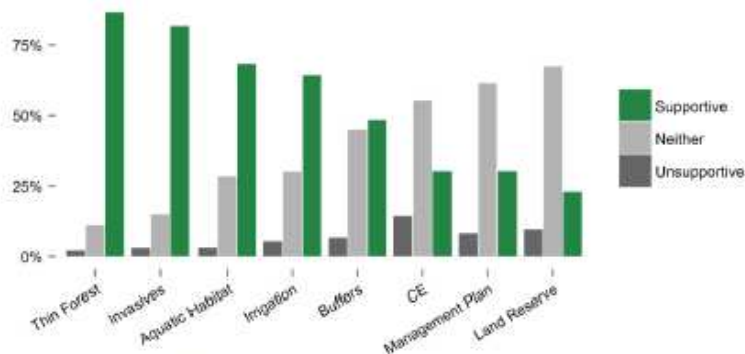


Figure 4.3 [Q19] Level of community support for select management practices (n=209-225)

SECTION FIVE

Your Community and You

This section summarizes the responses to questions in the *Your Community and You* section of the survey. These questions asked about landowners' connection with the physical environment and social community within the Whychus Creek Watershed. Additionally, this section included questions about respondents' interactions with their neighbors and other important sources of land management information.

**Place Connections**

*Q20. How attached do you feel to each of the following places?*

More than 50% of respondents reported being *Extremely Attached* or *Very Attached* to the City of Sisters, Whychus Creek Watershed, Central Oregon, Pacific Northwest and the Western U.S. Most respondents reported being *Slightly Attached* or *Not Attached* to the City of Bend.

**Table 5.1 [Q20] Level of attachment to different places (n=239-243)**

	Extremely Attached	Very Attached	Moderately Attached	Slightly Attached	Not Attached	n
<i>Pacific Northwest</i>	36%	37%	16%	7%	4%	241
<i>Western U.S.</i>	27%	35%	25%	8%	5%	239
<i>City of Sisters</i>	23%	35%	27%	8%	7%	242
<i>Whychus Creek Watershed</i>	22%	34%	28%	10%	6%	243
<i>Central Oregon</i>	18%	44%	27%	7%	4%	241
<i>Upper Deschutes Watershed</i>	12%	30%	30%	16%	12%	243
<i>City of Bend</i>	1%	11%	37%	26%	25%	241

*Q21. How much do you agree or disagree with the following statements about the importance of the Whychus Creek Watershed to you personally?*

Table 5.2 shows the percentage of respondents who agreed or disagreed with each statement about the Whychus Creek Watershed. The items in this question were based on the Sense of Place Scale<sup>1</sup> (Jorgensen and Stedman 2001). In general, more respondents agreed than disagreed with each of the statements. The following statements showed the highest levels of disagreement: 1) don't identify with the Whychus Creek Watershed, 2) there are better places to be and 3) enjoy the activities I undertake here just as well in another place (Figure 5.1).

<sup>1</sup> The Sense of Place Scale measures place attachment, place identity and place dependence. "Be Myself", "Type of Person" and "Don't Identify" measure identity. "Miss It", "Favorite Place" and "Happiest" measure attachment and "Best Place," "Enjoy Other Places" and "Better Places" measure place dependence.

Table 5.2 [Q21] Place connection to Whychus Creek Watershed (n=233-240)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	n
<i>Be Myself: I feel I can really be myself when I am there</i>	16%	35%	43%	5%	1%	237
<i>Miss it: I really miss it when I am away too long</i>	16%	41%	32%	9%	2%	234
<i>Type of Person: It reflects the type of person I am</i>	13%	43%	40%	4%	0%	234
<i>Favorite Place: It is my favorite place to be</i>	12%	37%	43%	7%	1%	240
<i>Happiest: I feel happiest when I am there</i>	11%	32%	48%	7%	2%	233
<i>Best Place: It is the best place for doing the things I enjoy</i>	10%	34%	48%	7%	1%	238
<i>Don't Identify: I really don't identify with the Whychus Creek Watershed</i>	4%	15%	30%	36%	15%	238
<i>Enjoy Other Places: I would enjoy the activities I undertake here just as well in another place</i>	3%	32%	40%	23%	2%	235
<i>Better Places: As far as I am concerned, there are better places to be</i>	2%	17%	48%	26%	7%	239

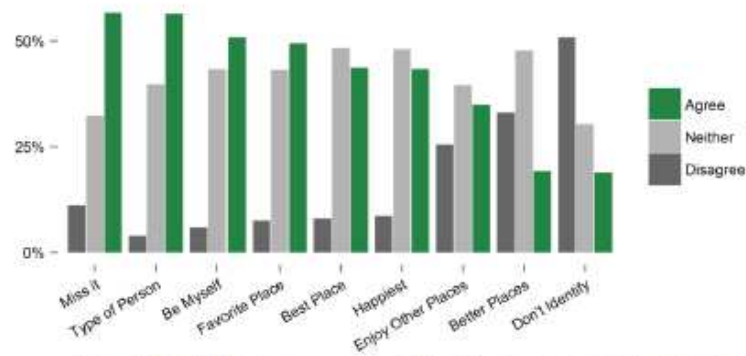


Figure 5.1 [Q21] Place connection to the Whychus Creek Watershed (n=233-240)

### Community Connections

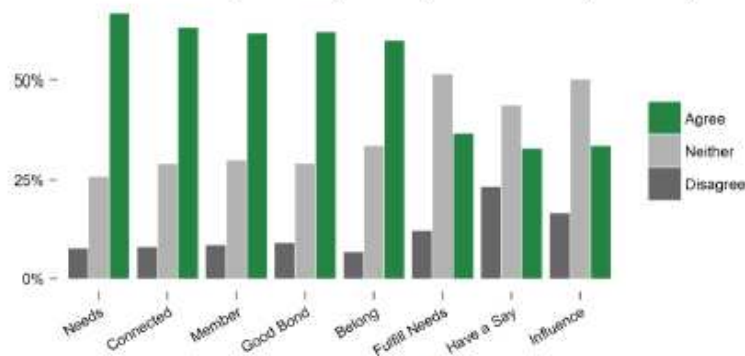
**Q22.** How much do you agree or disagree with the following statements about the importance, to you personally, of your community within the Whychus Creek Watershed?

The items in this question were based on the Brief Sense of Community Scale<sup>1</sup> (Peterson et al. 2008). In general, more respondents agreed than disagreed with each of the statements (Table 5.3, Figure 5.2). Items with the least amount of agreement included 1) have a say about what goes on in my community, 2) people in my community are good at influencing each other and 3) my community helps me fulfill my needs.

<sup>1</sup> "Needs" and "Fulfill Needs" measure needs fulfillment; "Connected" and "Good Bond" measure emotional connection; "Member" and "Belong" measure membership and "Have a Say" and "Influence" measure influence.

**Table 5.3 [Q22] Community of Whychus Creek Watershed as allowing for needs fulfillment, emotional connection, membership and influence (n=233-238)**

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	n
<i>Member: I feel like a member of my community</i>	10%	52%	30%	6%	2%	237
<i>Good Bond: I have a good bond with others in my community</i>	9%	53%	29%	7%	2%	235
<i>Connected: I feel connected to my community</i>	8%	55%	29%	6%	2%	238
<i>Belong: I belong in my community</i>	8%	52%	33%	4%	3%	236
<i>Needs: I can get what I need in my community</i>	6%	61%	26%	6%	1%	237
<i>Have a Say: I have a say about what goes on in my community</i>	3%	30%	44%	17%	6%	237
<i>Influence: People in my community are good at influencing each other</i>	3%	30%	50%	14%	3%	236
<i>Fulfill Needs: My community helps me fulfill my needs</i>	2%	34%	51%	10%	3%	233



**Figure 5.2 [Q22] Community connection to the Whychus Creek Watershed (n=233-238)**

### Social Interactions in the Whychus Creek Watershed

*Q23. How often do you talk to your neighbors about the following items?*

Table 5.4 shows the percentage of respondents who talk to their neighbors about various subjects including the use and management of their land, future plans for their land, protection of Whychus Creek Watershed, land management programs and conservation in general. About 50% responded that they *Never* talk to their neighbors about these subjects. However, about 20% responded that they talk to their neighbors about the use and management of their land, future plans for their land and conservation in general *Every Few Months*.

**Table 5.4 [Q23] Frequency that respondents talk to their neighbors about various conservation and land management subjects (n=244-246)**

	Never	Annually	Every Few Months	Monthly	Every Few Weeks	Weekly	More than Once a Week	n
Land management programs	56%	23%	14%	3%	1%	2%	0%	245
Protection of the Whychus Creek Watershed	50%	25%	15%	5%	3%	1%	1%	245
Future plans for your land	49%	28%	18%	1%	2%	2%	0%	246
Use or management of your land	43%	28%	22%	3%	3%	1%	0%	246
Conservation in general	36%	30%	22%	4%	4%	2%	2%	244

**Q24. What does neighbor mean to you? (n=243)**

- 44% said "People that live in the same general community as me"
- 21% said "People that live next to me, but also people a few houses down"
- 20% said "People who live within a mile of me"
- 6% said "People who live within two miles of me"
- 5% said "Only the people that live on the land next to me"
- 5% said "Other"

**Q25. How often do you take note of how your neighbor manages their land?**

Greater than 80% of respondents reported that they observe how their neighbor manages their land at least *Sometimes*, while 3% reported that they *Never* take note of how their neighbor manages their land (Table 5.5).

**Q26. How often have you specifically done something because of your neighbor's success with it?**

Although, respondents observe how their neighbor manages their land, they don't necessarily act on these observations. About 50% of respondents reported that they *Never* or *Rarely* do something specifically because of their neighbor's success with it, while 42% *Sometimes* do something because of their neighbor's success with it (Table 5.5).

**Q27. How often have you specifically avoided doing something because of your neighbor's failure with it?**

Few respondents avoid doing something because of their neighbor's failure with that method (Table 5.5). 32% reported that they *Sometimes* avoid doing something because of their neighbor's failure with that method.

**Table 5.5 Frequency that respondents observe and respond to neighbor's management of land [Q25,26,27]**

	Never	Rarely	Sometimes	Often	All the Time	n
Q25. Take note of how your neighbor manages their land	3%	14%	32%	35%	16%	255
Q26. Done something	26%	23%	42%	7%	2%	254
Q27. Avoided something	35%	21%	32%	9%	3%	239

*Q28. How much do you trust land management information from the following individuals or institutions?*

The top three information sources that respondents had *High Trust* for included 1) spouse, 2) land trusts and 3) watershed councils (Table 5.6). The top three information sources that respondents had *Moderate Trust* for included 1) neighbors, 2) soil and water conservation districts and 3) extension staff. The top three information sources that respondents had *No Trust* for included 1) government agencies, 2) environmental organizations and 3) producer groups. Most respondents reported that they were *Unsure* about producer groups.

**Table 5.6 [Q28] Level of trust for land management information from various sources (n=218-235)**

	High Trust	Moderate Trust	A Little Trust	No Trust	Unsure	n
<i>Spouse</i>	51%	25%	8%	5%	11%	221
<i>Relatives</i>	19%	33%	23%	11%	15%	226
<i>Neighbors</i>	7%	50%	30%	5%	8%	230
<i>Land trusts</i>	27%	34%	18%	9%	11%	235
<i>Watershed councils</i>	21%	35%	19%	11%	13%	231
<i>Environmental organizations</i>	18%	31%	22%	21%	8%	234
<i>Producer groups</i>	0%	13%	31%	18%	37%	218
<i>Professional consultant</i>	7%	32%	33%	12%	15%	231
<i>Extension staff</i>	17%	38%	26%	7%	12%	227
<i>Soil and water conservation districts</i>	14%	41%	26%	8%	10%	230
<i>Government agencies</i>	4%	32%	28%	26%	10%	234

*Q29. When you are struggling with a difficult question or problem related to managing your land, please list the 3 or 4 people whose opinion you most respect. (n=131)*

301 individuals or institutions were listed by 131 respondents. 21% of the individuals listed were neighbors; 17% were spouses; 17% were affiliated with a government agency; 10% were friends; 9% were affiliated with a land trust; 6% were relatives; 6% were professionals; 3% were extension staff; 3% were environmental organizations; 2% were attorneys; 2% were realtors. The remaining 4% were soil and water conservation districts, watershed councils, fire districts, irrigation districts and farmer or ranchers.

*Q30. Have you ever received land management or conservation information from the following individuals or institutions? Check all that apply. (n=196)*

The top five sources of land management information included 1) land trusts, 2) government agencies, 3) neighbors, 4) environmental organizations and 5) soil and water conservation districts.



Q31. Whose opinion do you think you would be most likely to follow when making a land management or conservation decision? (n=237)

The top five individuals or institutions whose opinion respondents reported being the most likely to follow included 1) spouse, 2) land trusts, 3) professional consultant, 4) soil and water conservation districts and 5) extension staff.

Table 5.7 shows both the percentage of respondents who have received land management information from each of the sources and the percentage of respondents who would follow the opinion of that source when making a land management or conservation decision. The values in bold represent the top five information sources.

**Table 5.7 [Q30,31] Information sources and influential opinions with the top five bolded (n=196-237)**

	Q30	Q31
<b>Land trusts</b>	<b>62%</b>	<b>27%</b>
Government agencies	40%	3%
Neighbors	31%	8%
Environmental organizations	30%	7%
<b>Soil and water conservation districts</b>	<b>29%</b>	<b>13%</b>
Extension staff	28%	11%
Watershed councils	26%	9%
Spouse	21%	34%
Professional consultant	16%	19%
Relatives	11%	7%
Producer groups	4%	0%

## SECTION SIX

# Response Comparisons by Group

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The following section takes a closer look at the differences between respondents. I grouped respondents into three categories based on their response to Q13—*In general, how likely or unlikely would you be to place a conservation easement on your property?* If respondents said they were *Very Likely* or *Likely* to place a CE on their property they were put in a group referred to as the **Yes Group**. If respondents said they were *Neither Likely nor Unlikely* they were put into another group referred to as the **Maybe Group**. Lastly, respondents that said they were *Unlikely* or *Very Unlikely* were put in the **No Group**. There were 43 respondents in the Yes Group, 95 in the Maybe Group and 119 in the No Group.

### Awareness of Conservation Easements

Awareness of the specific characteristics of CEs may be an important component differentiating respondents based on their likelihood of placing a CE on their property. Figure 6.1 [Q9] shows the differences in awareness for each group. Refer to Section Three or Appendix B for the full item descriptions.

#### Key Findings

The Yes Group, as we might expect, had the smallest percentage of respondents who were *Not Aware*, whereas the Maybe and No Groups had a much larger amount of respondents who were *Not Aware*.

Respondents in the Yes Group showed the lowest awareness that CEs 1) give the right to monitor and enforce property restrictions to an eligible organization such as a land trust, 2) may provide financial incentives and 3) do not require public access. About 75% of respondents in the Yes Group were *Aware* or *Very Aware* that CEs 1) limit the uses of a property, 2) can be applied to the entire property or a portion of it, 3) are voluntary and 4) keep land in private ownership. A little over 50% of the respondents in the No Group were *Aware* or *Very Aware* of these characteristics; however, a lower percentage of the respondents in this group were *Aware* or *Very Aware* that a CE can be applied to the entire property or a portion of it.

The Maybe Group showed the lowest amount of awareness overall. The Maybe Group was most aware that CEs 1) limit the uses of a property, 2) are voluntary and 3) keep land in private ownership. This comparison may reveal that awareness is a limiting factor for the Maybe Group.

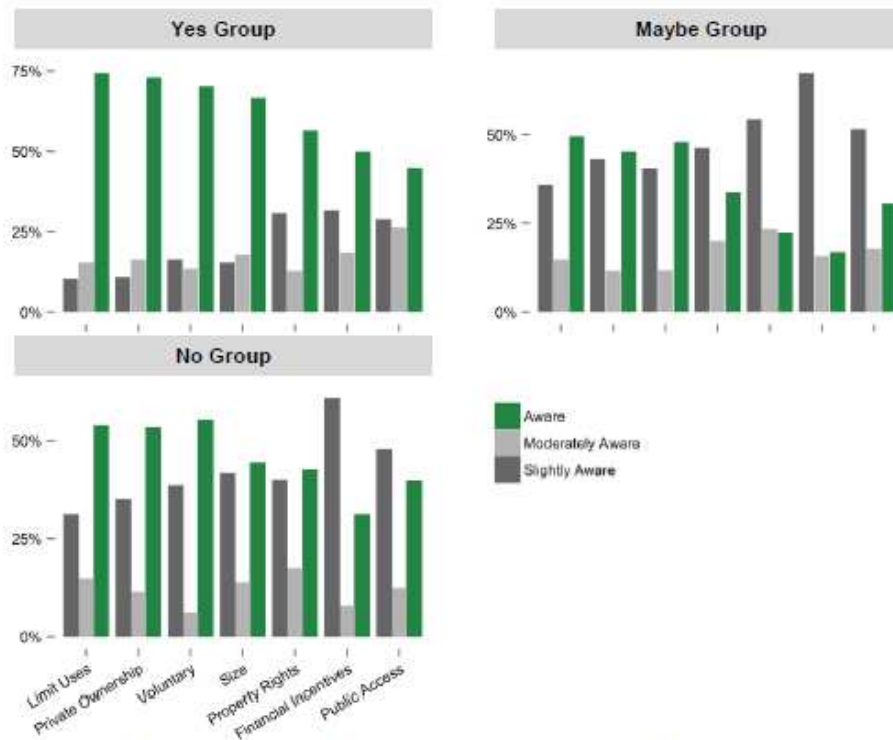


Figure 6.1 [Q9] Awareness: compares respondents in the Yes (n=43), Maybe (n=95) and No (n=119) group based on their responses to Q9

### Attitudes towards Conservation Easements

Additionally, I wanted to explore differences in respondents' attitudes towards CE based on their group. Figure 6.2 [Q11] on the following pages illustrates these differences. Refer to Section Three or Appendix B for the full item descriptions.

#### Key Findings

In general, the Yes Group had more positive attitudes towards CE than the Maybe and No Groups while the No Group had more negative attitudes. For most items, the Maybe Group expressed a neutral opinion.

The Yes Group agreed that "CEs are important for their community." The Maybe Group agreed with this statement as well, but the No Group did not. The No Group disagreed most with the following statements 1) CE are convenient for my heirs, 2) CE are wise for me financially and 3) CE are compatible with how manage my land.

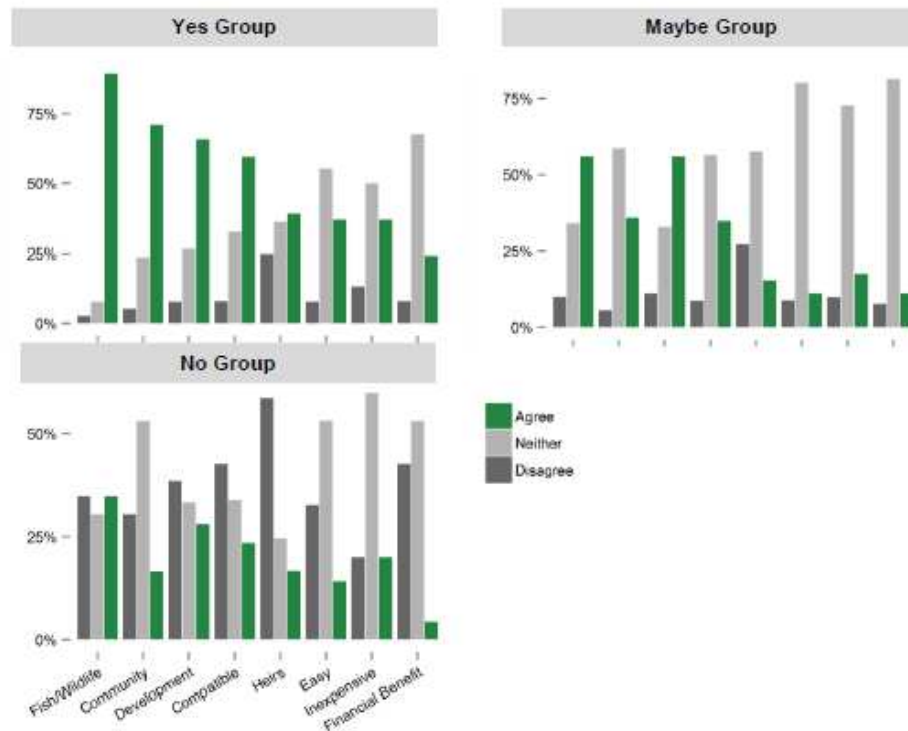


Figure 6.2 [Q11] Attitudes: compares respondents in the Yes (n=43), Maybe (n=95) and No (n=119) group based on their responses to Q11

### Risk and Conservation Easements

I was interested in determining if respondents in the Yes, Maybe and No Groups perceived different levels of risk associated with CEs. Figure 6.3 [Q12] on the following pages illustrates these differences. Refer to Section Three or Appendix B for the full item descriptions.

#### Key Findings

In general, the No Group perceived the highest amount of risk, the Maybe Group was unsure about the amount of risk and the Yes Group perceived the lowest amount of risk associated with CEs.

More than 50% of respondents in the No Group thought there was a high risk of CEs causing difficulty in the future sale of the property and leading to future regulatory burdens. Another area of high perceived risk for the No Group was the risk of privacy loss. Conversely, more than 50% of the Yes Group thought this item had low risk.

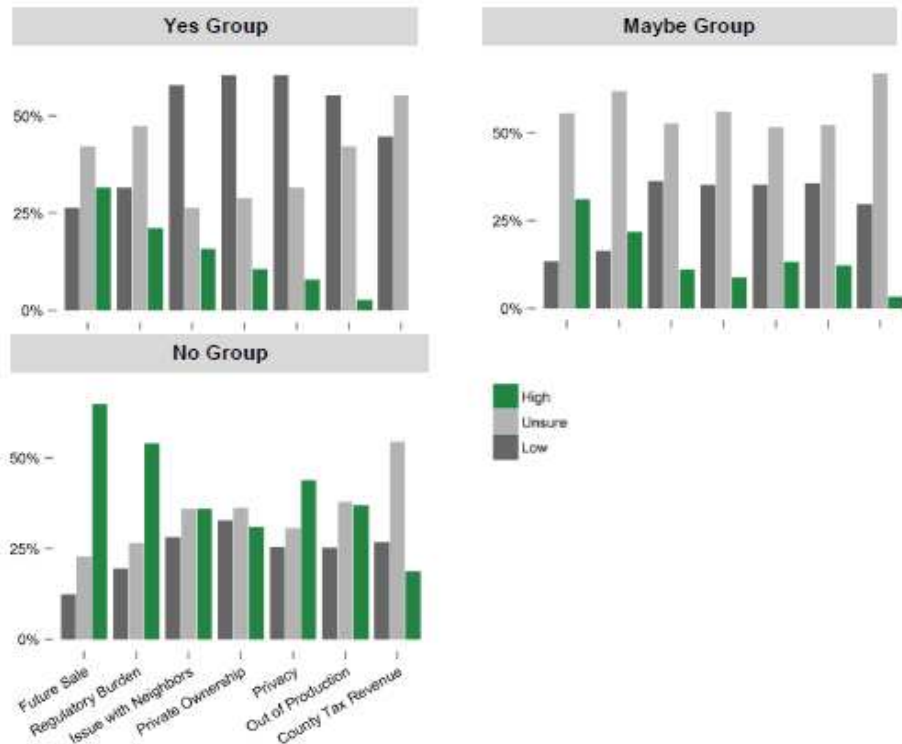


Figure 6.3 [Q12] Risk: compares respondents in the Yes (n=43), Maybe (n=95) and No (n=119) group based on their responses to Q12

### Interest in Conservation Easements

In order to understand how different costs and benefits may change respondents' likelihood to place a CE on their property I compared the three groups based on their answers to Q14. Figure 6.4 [Q14] on the following pages illustrates these differences. Refer to Section Three or Appendix B for the full item descriptions.

#### Key Findings

In the questionnaire respondents were asked, assuming that they were considering a CE, how likely or unlikely would they be to place a CE on their property under a various conditions.

The likelihood of a respondent in the No Group to place a CE on their property increased under the following conditions: if they were offered 1) a property tax benefit, 2) an estate tax benefit, 3) an income tax benefit, 4)

property rights assurances to guarantee no additional regulatory burdens would arise as a result of the CE or 5) paid the value of the CE. Under these conditions, approximately 25% of respondents in the No Group, shifted to *Likely* or *Very Likely*, while a little more than 25% shifted to *Neither Likely nor Unlikely*.

Under these same five conditions, more than 50% of respondents in the Maybe Group, shifted to *Very Likely* or *Likely*, while a little less than 50% remained *Neither Likely nor Unlikely*. Over 50% of the Yes Group maintained a *Very Likely* or *Likely* response even if there was no benefit associated with the CE or if they were asked to make a donation to the land trust for the management of the CE.

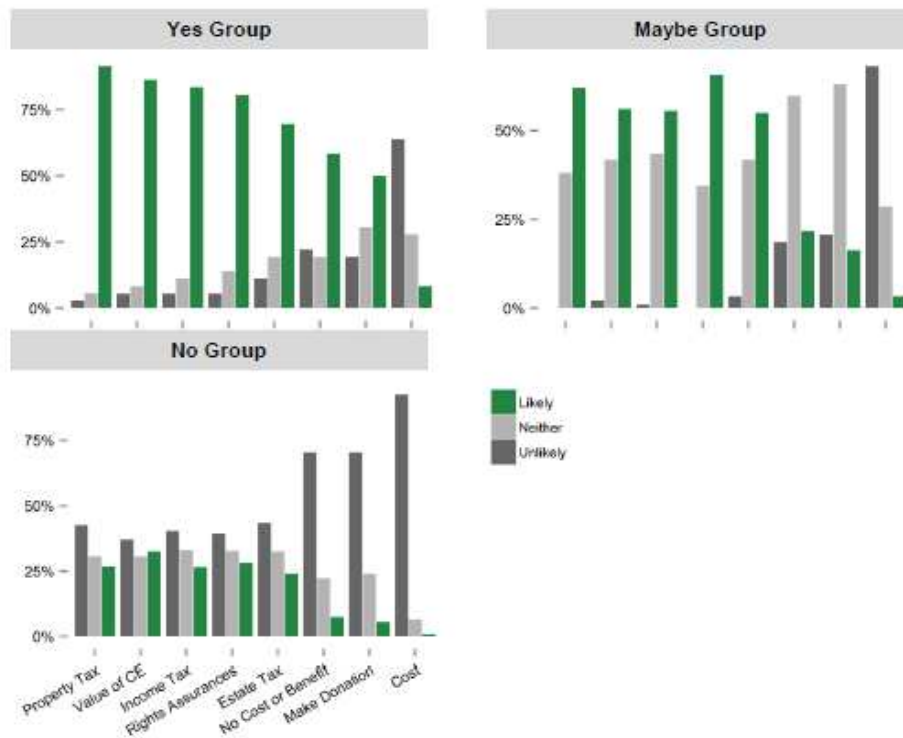


Figure 6.4 [Q14] Cost and Benefit: compares respondents in the Yes (n=43), Maybe (n=95) and No (n=119) group based on their responses to Q14

## Place Connections

Q21 was meant to assess respondents' connection to the Watershed. The sense of place literature highlights the link between a strong positive sense of place and place protection behavior (Cross et al. 2011, Vaske and Kobrin 2010). Therefore, I was interested in the differences between the three groups in terms of their connection to the Whychus Creek Watershed. Figure 6.5 [Q21] compares the Yes, No and Maybe Groups based on their responses to Q21. Refer to Section Five or Appendix B for the full item descriptions.

### Key Findings

Most respondents in the Yes Group agreed with the place statements. About 50% of the respondents in the Maybe Group agreed with the place statements, whereas on average less than 50% of the No Group agreed with the statements. More respondents in the Maybe and No Groups marked *Neither Agree nor Disagree* compared to respondents in the Yes Group. This comparison suggests that sense of place may be associated with interest in CEs.

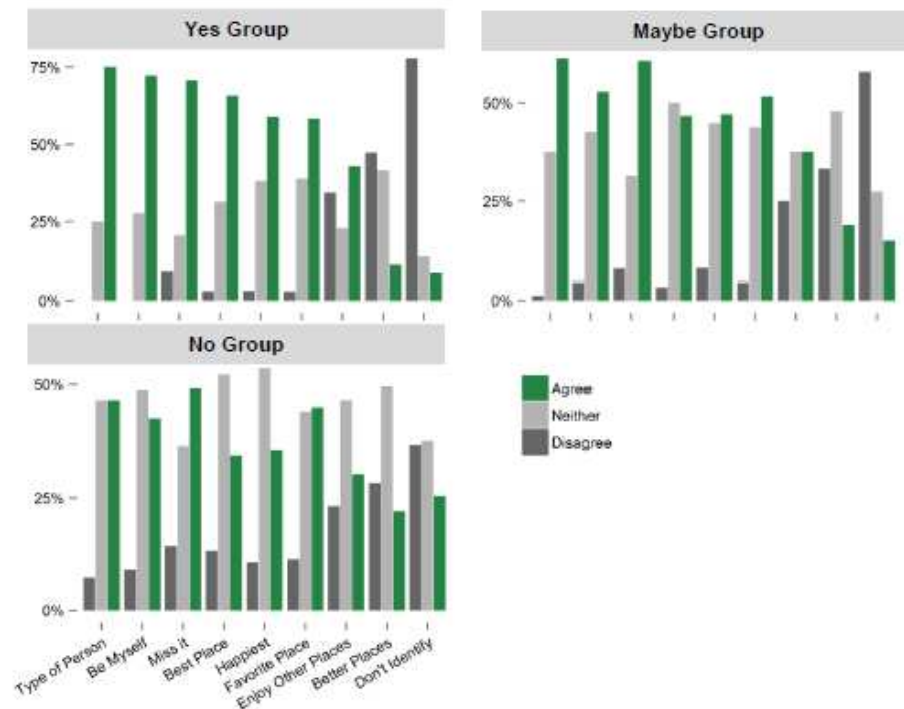


Figure 6.5 [Q21] Place Connections: compares respondents in the Yes (n=43), Maybe (n=95) and No (n=119) group based on their responses to Q21

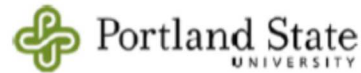
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## APPENDIX C. Human Subjects Approval



Post Office Box 751                      503-725-2227 tel  
Portland, Oregon 97207-0751        503-725-8170 fax  
Human Subjects Research Review Committee  
hsrrc@lists.pdx.edu

Date: June 12, 2015

To: Max Nielson-Pincus / Ashley Vizek

From: Karen Cellarius, HSRRC Chair

A handwritten signature in black ink that reads 'Karen Cellarius'.

Re: HSRRC approval for your project titled, "Private Land Conservation: Landowner Awareness and Attitudes"  
HSRRC Proposal # 153463

Approval-Expiration: June 12, 2015 – June 11, 2016

Review Type: Expedited, Category 7

In accordance with your request, the PSU Human Subjects Research Review Committee has reviewed your request for approval of the project referenced above for compliance with PSU and DHHS policies and regulations covering the protection of human subjects. The Committee is satisfied that your provisions for protecting the rights and welfare of all subjects participating in the research are adequate, and your project is approved. Please note the following requirements:

**Approval:** You are approved to conduct this research study only during the period of approval cited above; and the research must be conducted according to the plans and protocol submitted (approved copy enclosed).

**Consent:** Signed consent is waived from all participants in this study. A written consent statement is required.

**Changes to Protocol:** Any changes in the proposed study, whether to procedures, survey instruments, consent forms or cover letters, must be outlined and submitted to the Committee immediately. The proposed changes cannot be implemented before they have been reviewed and approved by the Committee.

**Continuing Review:** *This approval will expire on 06/11/2016.* It is the investigator's responsibility to ensure that a *Continuing Review Report* on the status of the project is submitted to the HSRRC two months before the expiration date, and that approval of the study is kept current. The IRB offices does not send out notifications of expiration dates. The *Continuing Review Report* is available at [www.rsp.pdx.edu/compliance\\_human.php](http://www.rsp.pdx.edu/compliance_human.php) and in the Office of Research and Strategic Partnerships (RSP).

**Adverse Reactions and/or Unanticipated Problems:** If any adverse reactions or unanticipated problems occur as a result of this study, you are required to notify the Committee immediately. If the issue is serious, approval may be withdrawn pending an investigation by the Committee.

**Completion of Study:** Please notify the Committee as soon as your research has been completed. Study records, including protocols and signed consent forms for each participant, must be kept by the investigator in a secure location for three years following completion of the study (or per any requirements specified by the project's funding agency).

If you have questions or concerns, please contact the Office of Research Integrity in the PSU RSP at 503-725-2227.