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Authors

Keske, Catherine MH
Arnold, Parker
Cross, Jennifer E
et al.

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Does Conservation Ethic Include Intergenerational Bequest? A Random Utility Model Analysis of Conservation Easements and Agricultural Landowners*

Catherine M. H. Keske
Management of Complex, Systems School of Engineering
University of California-Merced

Parker Arnold
Department of Sociology
Colorado State University

Jennifer E. Cross
Department of Sociology
Colorado State University

Christopher T. Bastian
Department of Agricultural and Applied Economics
University of Wyoming

Abstract As the average age of agricultural producers continues to rise, farm succession planning and the large number of anticipated land transfers are expected to transform rural American agricultural production and landscapes. Policy tools like conservation easements (CEs) can facilitate agricultural land preservation through "dead hand control" by restricting the development through binding legal contracts that can be transferred across generations. We examine whether agricultural landowners seek CE agreements to keep the land in agriculture for intergenerational bequest, rather than selling the land for financial gains that could be enjoyed immediately or passed to heirs. We assess whether this may be influenced by landowner conservation ethic or perceived threat to sense of place. We analyze the survey data collected from 2,270 agricultural landowners in Colorado and Wyoming utilizing a random utility model estimation. We find that landowners are less likely to reject a CE agreement when there is a desire to bequest agricultural land to the next generation or a perceived threat to sense of place; however, conservation ethic mitigates intergenerational bequest effects. This indicates that conservation ethic encompasses a desire to pass land to the next generation. Our findings contribute to the conservation literature by advocating for the regenerative approach to land conservation rather than the theory of planned behavior.

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Introduction

Scholars (Carolan 2018; Rotz, Fraser, and Martin 2019), government (Bigelow, Borchers, Hubbs 2016), industry (Maixner and Wyant 2019), and conservation organizations (Chang 2016) portend that a high proportion of agricultural lands will change hands during the next three decades, perhaps up to 371 million acres or 40 percent of all agricultural lands (American Farmland Trust 2020). The high volume of anticipated land transfers invokes uncertainty about the future of food production and the environmental benefits provided by agricultural lands, like open space, wildlife habitat, and biodiversity (Quintas-Soriano et al. 2020; Richardson 2018).

Farm succession planning continues to become increasingly important for farmland preservation. The average age of U.S. agricultural producers has increased to 57.2 years, up 1.2 years from the previous 5-year Agricultural Census (NASS 2019). Agricultural producers aged 65+ years comprise the fastest growing age cohort and 18 percent are greater than 85 years of age (Obudzinski 2016). Farm management is changing, with younger producers reportedly being more open to environmental stewardship and technology adoption than older producers (Leonard et al. 2020). Farms are growing larger, and more than half of crop lands are rented (Bigelow et al. 2016), indicative of the power imbalance between agricultural landowners and tenant farmers. Volatility surrounding international commodity markets as well as the COVID-19 pandemic have created disruption and ongoing economic uncertainty for farms, making long-term planning difficult (Grant, Orden, and Marchant 2020). As rural North America braces for a wave of farm succession, mostly likely to individuals who are from within the family (Carolan 2018; Obudzinski 2016), those who seek to protect agricultural open space look to policy tools that will protect these spaces for the long haul.

This study evaluates the factors that influence the likelihood that agricultural landowners will engage in a perpetual conservation easement agreement (CE) to protect their land as a bequest to future generations. Using a random utility model analysis, we find a positive, statistically significant correlation between intergenerational land bequest and likelihood of CE selection, and we find statistical evidence that conservation ethic encompasses intergenerational land bequest. Since our study sample is comprised of deeded agricultural landowners (and not tenants) who also are agricultural producers, we use the terminology "agricultural landowners" and "agricultural producers" interchangeably when discussing study specifics. Our findings also contribute to the discourse about conservation ethics held by agricultural producers and the importance

of using CE agreements to protect sense of place. CE agreements restrict the future value of the land (Bastian et al. 2017). Rather than encumber land with a CE, agricultural landowners may simply bequest the land to their heirs, unencumbered at higher value, or sell their land and reap financial rewards that they in turn could enjoy immediately or bequest to their heirs.

The results of our study also illuminate the "deal breakers" that make many agricultural landowners less inclined to enter into a CE agreement, such as allowing public access to private property. Our findings reinforce other studies that show agricultural landowner willingness to enter into CE agreements is highly dependent upon context, and specific to an individual's situation (Leonard et al. 2020). The implications of our study may be beneficial to facilitate private land conservation agreements, which are increasingly providing continuity to meet conservation targets through public–private conservation partnerships (Loeb and D'Amato 2020). Results also contribute to the growing quantitative research on how economic dependence and conservation ethic are entwined with identity and sense of place on working lands (Bastian et al. 2020; Eaton et al. 2019).

Background and Literature Review

A CE is a voluntary, but legally binding, agreement between a landowner and a land trust or government agency that permanently restricts uses of the land to protect its conservation values, and thus reduces the current value of the property (Bastian et al. 2017; Chang 2016; Houseal 1990; McLaughlin 2013). As of 2016, nearly 16.8 million acres of land were held under CE by land trusts, nonprofit organizations that acquire CEs and steward the land to ensure its protection (Chang 2016). This reflects an increase of 9 million acres, or nearly double, from the previous 5-year national land trust census, and a fourfold increase in CEs between 2000 and 2010 (Bastian et al. 2017). In the most recent census, protection of agricultural land rose to one of the three highest priority areas for land trusts (Chang 2016).

CEs are more prevalent in North America, but similar policies have been increasingly implemented throughout the world. Landowners may sell a CE; donate a CE to receive tax benefits; or receive a combination of the two. It is common for landowners entering into CEs to agree to prohibit future building on the parcel; limit future buildings to certain areas on the parcel; and/or restrict land use for which they may receive payment and/or tax benefits for the reduced land value. Land under CE remains privately owned and can be transferred although by agreement,

the development rights are effectively eliminated (Gustanski and Squires 2000; McLaughlin 2013).

As a result of the increasing use of CEs over the past 20 years, researchers have examined agricultural landowner and producer motivations for entering into CE agreements. Among the findings, Farmer, Chancellor, and Fischer (2011) note that landowners' motivation to limit development stems from environmental ethics and values, a personal history associated with place, direct observations of land development, and a desire to provide farmland as a public good. These authors show that environmental values were the primary motivation for CE adoption, with the desire to uphold uniqueness of place being ranked second. Financial reasons were the lowest ranked motivational factor; however, financial benefits contributed to easement placement that otherwise would not have transpired. Brain, Hostetler, and Irani (2014) note that ranchers entering into CE agreements are motivated by financial incentives and conservation ethic. Rissman et al. (2007) demonstrate that CEs are one of the most important tools for protecting biodiversity on private lands. Farmer et al. (2015) show that landowners who were economically dependent upon the land required additional financial incentives to enter into CE agreements, as compared to those who entered into CEs for nonfinancial motivations though there is substantial heterogeneity in landowner motivations, between altruism and financial benefits. Farmer et al. (2015) also find that absentee landowners are less affected by financial benefits than who dwell on, or who are adjacent to, the property.

Simultaneously, discourse has ensued about defining the scope of landowner conservation ethic, and how this influences the agricultural land protection. Kabii and Horwitz (2006) develop a conceptual model that hypothesizes how landowners are more likely to enter into a perpetual conservation covenant if they have a strong conservation ethic, which is manifested by strong attachment to the natural environment. Vaske et al. (2018) document that farmers exhibit high ethical obligation toward land management and environmental conservation, and that they mutually consider societal and private interests in their land management decisions. Farmer et al. (2016) identify that landowners interested in perpetual CEs also have interests in recreation and conservation organizations.

Prokopy et al. (2008) find several variables that correlate with farm operators' conservation behavior, including ideological orientation toward stewardship. In a meta-analysis of quantitative studies on conservation adoption over a 35-year time window, Prokopy et al. (2019) note that farmer self-identification is motivated by environmental stewardship, and past participation in conservation programs, to be among

the few variables positively associated with conservation program adoption. These findings are consistent with Ajzen's (1991) theory of planned behavior (TPB), stating that behavior follows intention. Land tenure, or land ownership is included among the factors that Prokopy et al. (2019) considered, as some authors note a positive correlation between conservation adoption and land ownership. Prokopy et al. (2019) find this relationship positive only slightly more often than it is negative, and not significant in the vast majority of observations. They conclude that more examination of the relationship between land ownership should be further reviewed due to the power imbalances between landowners and tenants, and the length of time to which individuals are connected to the land.

Legal scholars have debated the permanency of CE agreements and the doctrine of "dead hand control" (Brewer 2011; Cheever and McLaughlin 2015; McLaughlin 2013), including for agricultural land protection (Houseal 1990). The perpetual nature of CE agreements arguably facilitates dead hand control by bestowing the desires of landowners who are not present in the community, or even alive, onto others (Lippmann 2005). The "mosaic" of local, state, and federal laws and tax policies that facilitate perpetual CEs is troubling to many legal scholars (Cheever and McLaughlin 2015; Parker 2004). Dead hand control can undermine democracy by concentrating power in the hands of those who are not among the community, and land covenants that beget dead hand control are typically viewed unfavorably by U.S. courts (Lippmann 2005). Thus, it is argued that for CEs to be legitimized, "…the landowner should be permitted to exercise dead hand control over the use of the property encumbered by the easement, but only so long as the easement continues to provide benefits to the public sufficient to justify its enforcement" (McLaughlin 2005:421).

IRS tax code 170(h) articulates the conservation values that must be protected by CEs for landowners and their families to receive financial benefits, including relief from estate taxes (McLaughlin 2018). So long as the conservation value criteria are met under the law, landowners do not need to explicitly state whether-or for whom-their motivations are financial or altruistic. Hence, landowner intentions for enacting dead hand control, or the desire to bequest land to future generations and whether there is a relationship with conservation ethic, has been relatively unstudied.

As previously articulated, the TPB promulgated by Ajzen (1991) states that behavior follows intention. Hence, our analysis evaluates whether there is a relationship between a desire to bequest land to future generations and conservation ethic, and whether these factors affect the

likelihood that an agricultural landowner will choose a CE agreement. To explore this issue, we examine the results of choice set scenario questions to estimate the relationship between intergeneration bequest and CE selection, while controlling for basic demographic components and threat to sense of place.

Data Collection

Data for the study were obtained from a mixed methods research project implemented to identify landowner and conservation organization attitudes about land protection. The idea to explore landowner intergenerational bequest, conservation ethic, sense of place, and CE deal breakers arose during the study's qualitative research phase of focus groups with landowners and land protection organizations.

Fifteen focus group interviews with 103 participants were conducted during the study's qualitative research phase to identify agricultural landowner and conservation organization attitudes about land protection and conservation agreements (Keske 2008; Miller et al. 2011). Subjects were recruited at the 2005 Land Trust Alliance meeting in Madison, Wisconsin, and three agricultural conferences in Wyoming and Colorado in 2006. Participants were asked to identify the conservation attributes that they sought to protect, and "deal breakers" that might prevent the conservation agreement engagement.

Consistent themes that emerged from the focus groups included protection of sense of place, conservation ethic, the importance of maintaining managerial control, and desire to protect land (or agricultural production) for future generations, though there was considerable heterogeneity in the landowner responses. Nearly all landowners articulated that they maintained a strong conservation ethic and desire to protect land for future generations but there were diverse opinions about what constituted "conservation" and how this might unfold in the short- and long-term future. Conservation ethic and intergenerational bequest were a convergent theme for nearly all landowners, with differences in the details and implementation. Though diverse opinions were expressed, we note the possibility of a group effect that could influence landowners to self-describe as adhering to a conservation ethic in their land management practices.

There were also robust opinions on both sides as to whether a CE agreement would be an appropriate land management decision that would facilitate (or conflict with) landowner long-term objectives. Landowners expressed divergent perspectives on compensation. Some expressed altruism and a personal desire to see their lands protected as agricultural land for future generations irrespective of compensation,

though others were clear that they would only engage in a conservation contract if they were adequately compensated. In summary, results from the focus groups indicated that landowner decisions about whether to enter into a CE agreement would be highly dependent upon the particular situation.

To more deeply examine the factors contributing to CE participation, emergent themes from the focus groups were then used to develop the 7-page 2007 Wyoming and Colorado Landowner Survey distributed to 4,955 agricultural landowners in Colorado and Wyoming. The survey instrument was comprised of four different sections: (1) Knowledge and Attitudes about Land Use and Conservation in Your Area, (2) Land Values and Characteristics, (3) Conservation Easements, and (4) Demographic Information.

The survey was distributed anonymously by the United States Department of Agriculture's National Agricultural Statistical Service (NASS) agency according to a random, stratified, sample of agricultural landowner/producers in Wyoming and Colorado, based on the latest agricultural census proportions for acres owned and dollars of sales. Producers owning less than 50 acres and receiving less than $1,000 in agricultural sales annually were not included to ensure that the sample comprised agricultural operations. Average ranch sizes in Colorado and Wyoming are 818 and 2,649 acres, respectively, with roughly 70 percent of farm income arising from livestock in both states, which requires sufficient grazing land (National Agricultural Statistics Service 2018). Thus, ranchette owners not meeting acreage and sales criteria would likely not have the same motivation as typical agricultural producers in the study region. NASS provided written verification to the researchers that the sample was comprised only of landowners and not tenant farmers.

A modified Dillman (2000) design was employed to collect the survey data. Approximately 2 weeks after the final mailing, approximately 10 percent of the non-respondents were sampled via telephone. Telephone respondents were asked the entire survey, not just a sub-sample of questions. Approximately 75 percent of the sample consisted of Colorado landowners and 25 percent of the sample represented Wyoming landowners, relatively proportionate to the states' population distribution. Miller (2007) concluded that the sample was representative of the intended population and that non-response bias was not an issue. The survey response rate was 46 percent, bringing the total number of observations used in the analysis to 2,270 agricultural landowners across both states (N = 1,707 in Colorado and N = 563 in Wyoming).

Methods

Results from the qualitative and quantitative data collection processes led to the design and implementation of the factor analysis and the random utility model analytical strategies. Description of the development of the explanatory and dependent variables and methods specification, along with the hypothesis tests follows.

Factor Analysis and Explanatory Variables

Landowner conservation ethics and protection of sense of place were among the key themes that emerged during the qualitative focus groups. A factor analysis was conducted on the 20-item Likert scale questions included in the "Knowledge and Attitudes about Land Use and Conservation" section of the Wyoming and Colorado Landowner Survey to develop explanatory variables. The 20-Likert scale questions are presented in Table 1.

The explanatory variable "Threat to Sense of Place" is an index that was initially developed by Keske et al. (2017). Place attachment and sense of place are grounded in psychological, social, and cultural processes that are embedded in larger social contexts (Brown-Saracino 2015; Manzo and Devine-Wright 2014; Molotch, Freudenburg, and Paulsen 2000; Stokowski 2013; Williams 2002). Through interaction, people form physical, emotional, and cognitive attachments to place which then become part of personal and group identities and bonds (Brown and Perkins 1992; Low and Altman 1992; Manzo and Devine-Wright 2014). For the purposes of this analysis, we treat sense of place more broadly as a single dimension (Keske et al. 2017; Mullendore, Ulrich-Schad, and Prokopy 2015), that can be further parsed out into separate dimensions using further analysis (Cross et al. 2011; Eaton et al. 2019).

To construct the index, a principal factor extraction with varimax rotation (Comrey and Lee 1992) identified five items that could be combined into a single index to describe the collective threats to sense of place as a result of population pressure. These five items clustered together into a single factor, or latent variable (Cronbach's alpha = .84), with each having good (.55) to excellent (.71) component coefficients, which are consistent with thresholds of high reliability (Cortina 1993). Although the coherency of these five items was established through the qualitative data analysis phase, in order to verify face validity, the analysis was repeated with different factor scale combinations. The five-item scale presented a higher Cronbach's alpha compared to any three-factor or two-factor combination. The 5-Likert scale components and their respective reliability coefficients (Cronbach's alpha) are presented in Table 2.

Table 1. 20-Item Likert Scale to Assess Threats to Sense of Place and Conservation Ethic.

Please circle the answer that best indicates land use in your community *Your community reflects common views, interests, landscapes and characteristics that make where you live distinct from other places. If you belong to more than one community, then answer the questions considering the community to which you are most closely tied*	**Strongly Disagree (1)–Strongly Agree (5)**				
Undeveloped, rural, and agricultural lands are being converted into housing developments	1	2	3	4	5
Agricultural land is being purchased by people who have little interest in agriculture	1	2	3	4	5
People moving into my community are changing its customs and cultures	1	2	3	4	5
Population growth has led to conflicts between neighbors	1	2	3	4	5
Population growth has led to more rules that threaten my livelihood	1	2	3	4	5
I believe the land I own or manage should be preserved for future generations	1	2	3	4	5
My personal history and identity are closely tied to my land and where I live	1	2	3	4	5
Agriculture is part of the historical character of my community	1	2	3	4	5
I have a responsibility to conserve nature (wildlife and open space) on my land	1	2	3	4	5
I manage my land in a way that maximizes benefit to my community.	1	2	3	4	5
It is important to be a good steward of my land	1	2	3	4	5
My community is where I most belong	1	2	3	4	5
I feel more myself here than anywhere else	1	2	3	4	5
I feel a spiritual connection to where I live	1	2	3	4	5
Please circle the answer that best indicates land use in your community					
Natural amenities in my community should be preserved for future generations	1	2	3	4	5
If the natural amenities around me changed, I would not stay	1	2	3	4	5
Lands in my community offer the amenities I am looking for in a place to live	1	2	3	4	5
My family's livelihood depends on economic productivity from my land	1	2	3	4	5
My future livelihood depends on having the flexibility to use my land the way I see fit	1	2	3	4	5
My family's financial well-being frequently conflicts with my plans for conservation	1	2	3	4	5

The "Conservation Ethic" index was originally introduced by Cross et al. (2011), and slightly modified for this analysis. Two-Likert scale items were removed from the original index to avoid potential collinearity issues and to exclude any items that might be highly correlated

Table 2. Sense of Place Threat Index and Conservation Ethic Index.

Threat to Sense of Place	
People moving into my community are changing its customs and culture	
Agriculture land is being purchased by people who have little interest in agriculture	
Population growth has led to conflict with neighbors	
Undeveloped rural and agricultural lands are being converted into housing developments	
Population growth has led to more rules that threaten my livelihood	
Cronbach's alpha (α)	.845
Conservation Ethic	
Agriculture is part of the historical character of the community	
I have a responsibility to conserve nature on my land	
I manage my land in a way that maximizes benefit to my community	
It is important to be a good steward of my land	
Cronbach's alpha (α)	.767

with other variables designed to specifically measure intergenerational planning. The factor analysis was re-run for the presenting study without the Likert scale items "I believe the land I own or manage should be preserved for future generations," and "Natural amenities in my community should be preserved for future generations."

The independent variable of central interest to the current study pertains to landowners' intergenerational succession plans presented in the "Land Values and Characteristics" section of the survey. Landowners were asked, "What are your plans for the intergenerational succession of your operation?" Respondents were given the options of "Sold to the next generation," "Given to the next generation," and "Sold to someone outside family." Responses to this question were recoded to reflect whether or not respondents' plans included keeping the land within their families. "Sell" and "give" to the next generation were recoded as "1" as an indicator of intention to keep the land in the family and sell outside the family was recoded as "0." The combined response options for "sold" and "given" to the next generation can be interpreted as the landowner's intentional plan to transfer land through intergenerational bequest.

Additionally, a number of common control variables such as age, gender, education, income, percentage of income from agricultural sales, and state residency were included from the Demographic Section of the survey. Table 3 provides summary statistics of the control and test variables used in the analysis. Additional discussion about the expected signs continues in the stated choice section.

Table 3. Descriptive Statistics for Control and Test Variables.

Variables	Description	Mean (Std. Deviation)	Expected Sign (+ or –)
Contract length	Length of CE Contract-25 Year (1) Perpetuity (0)	.558225 (.496632)	–
Public access to land	CE allows public access to the land-Yes (1) No (0)	.480863 (.499668)	–
Wildlife habitat provision	CE includes wildlife habitat provision Yes (1) No (0)	.498643 (.500032)	+
Control	CE restricts landowners productive use of the land-Yes (1) No (0)	.521987 (.49955)	–
Payment	Payment in Percentage of Market Rent Price—0, 25, 50,75, and 100	51.20793 (36.0219)	+
Age	Age of Respondent	58.96049 (10.75747)	Uncertain
Gender	Gender of Respondent-Male(1), Female(2)	1.148781 (.355889)	Uncertain
Education	Education Level-High school (1), Some College (2), Technical/ Vocational Degree (3), Bachelor's Degree(4), Some Graduate Education(5), and Graduate Education (6)	2.878319 (1.690962)	+
Income	Income of Respondent- <$1000 (1), $1,000–4,999 (2), $5,000–9,999 (3), $10,000–24.999 (4), $25,000–49,999 (5), $50,000–99,999 (6), $100,000–249,999 (7), $250,000–500,000 (8), and >$500,000 (9)	4.573099 (2.211636)	+
Percent income	Percent Income From Agricultural Sales (reported in %)	42.99792 (37.81733)	–
Wyoming	Wyoming Resident-Yes(1) No(0)	.251975 (.434167)	–
Next generation	Intergeneration Succession Plan-Give or Sell to Next Generation (1), Sell to Someone Outside Family (0)	.754844 (.4302)	+

Stated Choice Experiment, Dependent Variable Specification, and Random Utility Model

Five attributes/themes that emerged from the focus groups were developed into closed-ended choice set scenarios that were structured into a stated choice experiment and evaluated using a random utility model analysis. An example of a choice set scenario, which appeared in the "Conservation Easements" section, is shown in Table 4. The choice set

scenarios were varied across 12 different versions of the survey, reflecting a total of 24 choice sets. The Optex procedure in SAS (1990) was used to design the choice set pairs. The design that had the highest diagonal efficiency (nearly 95 percent) with the least number of stated choice pairs was chosen. Twelve versions of the questionnaire were developed for landowners, using two stated choice questions each. These 12 versions were mailed to an equal number of potential respondents in the sample.

Wildlife habitat was selected as one of the five themes appearing in the choice set because during the focus groups, landowners and conservation organizations both consistently articulated the value of agricultural lands for wildlife protection. The other four themes in the choice set were identified as potential deal breakers for landowners: length of conservation contract, public access, loss of managerial control over agricultural operations, and receiving insufficient payment by conservation organizations for protected areas. Each choice set asked the respondent to select from three choices: Easement A, Easement B, or Neither. The answer to this question forms the dependent variable for the random utility model analysis.

In the choice survey, respondents choose between scenarios with differing types and levels of attributes. Choices are depicted using random utility theory assuming that individuals make choices that maximize their utility on a given choice occasion. If someone interested in transacting a CE were faced with a choice between CE alternatives, they would choose the CE that maximizes their utility at that time. This is represented as follows:

$$U_i = V_i + \varepsilon_i > \; U_j = V_j + \varepsilon_j \tag{1}$$

where the utility function for an individual contains both a deterministic component (V) and an unobservable stochastic component (ε). Thus, an individual is expected to choose CE alternative i over CE alternative j for this choice occasion.

The indirect utility functions identified in Equation 1 can be estimated as:

$$V_i = \beta_k X_i \tag{2}$$

where X is a vector of k attributes associated with alternative i and β parameters.

Statistical analyses reveal the factors that impact the indirect utility functions and ultimately choice as well as the direction of that impact.

The dependent variable is choice for a given choice occasion: respondents must pick CE "A," CE "B" or "Neither" for each stated choice

Table 4. Choice Sets from Wyoming and Colorado Agricultural Landowner Survey Instrument.

Features	Easement A	Easement B	Neither
Contract length of easement	Perpetuity	Perpetuity	No conservation easement is granted
Access provided to the public	Yes	No	
Habitat on the parcel would be placed under protection from development (e.g. wildlife)	Yes	No	
Alternative production practices or enterprises must be approved by the land trust before implementation	Yes	No	Right to develop fully the land for housing is unaffected in any way
Payment for easement expressed as a percent of the average land market value (as expressed in section B question 1) in addition to any tax benefits	Income and estate tax benefits plus 50% of average market value of land	Income and estate tax benefits plus 25% of average market value of land	
Given the above attributes which easement would you prefer?	A ☐	B ☐	I choose neither A nor B ☐

scenario they face, as shown in Table 4. The probability of a specific choice i in a multinomial logit random utility model can be represented as follows:

$$P_{i:At} = \frac{e^{Vit}}{\sum_{j=1}^{j} e^{Vjt}} \tag{3}$$

where j = the number of choice alternatives, t = a given choice occasion, A = the set of available alternatives for choice occasion t, e = base of the natural logarithm, and V = is the indirect utility equation as presented earlier. Thus, each random utility model includes j indirect utility equations to explain P_i represented in Equation 3.

The model is estimated as a multinomial logit model with random effects to address potential correlation between choices for each respondent (Chen and Kuo 2001). As each respondent had two stated choice questions, the potential for correlation between the two responses for each respondent must be addressed (Revelt and Train 1998). We address this correlation using a panel estimator combined with the multinomial logit specification, where the number of choices for each respondent is specified in the NLOGIT version 6 software used for estimation (LIMDEP 2020). The error terms are i.i.d. extreme value (Chen and Kuo 2001). Multicollinearity was not found to be an issue among the variables of analytical interest. The variables for intergenerational succession planning, conservation ethic, and threat to sense of place were all found to have low levels of correlations (i.e. $r < .3$).

Model Specification and Hypothesis Tests

The random utility model analysis assesses the likelihood that a landowner will select a CE. If the attributes described in a choice set are consistent with the attributes desired by dead hand control, and CE as a policy mechanism is acceptable to the landowner, then the independent variables would explain the selection of either CE A or CE B in the choice set. However, if either the choice set attributes or the CE policy mechanism are inconsistent with a landowner's dead hand control interests, then the individual respondent would select "Neither A Nor B."

A summary of the expected signs is presented in Table 3. In the current study, we interpret respondents' easement selections (i.e. selection of either Easement A or Easement B) as a suitable indicator of the likelihood to place an easement in the future. Based upon the results from the focus group research, and other quantitative analysis of the Wyoming and Colorado landowner survey, we expect that loss of managerial control and increasing public access to privately held land will result in a negative expected sign, or a decrease in the likelihood that a landowner will select a conservation easement. Economic theory indicates that an increased payment to enter into a CE will make landowners more inclined to enter into a CE, so a positive sign is anticipated. A positive relationship between wildlife habitat and likelihood to enter into a CE agreement is expected, because landowners overwhelmingly acknowledged the value of agricultural lands in the provisioning of wildlife habitat during the focus groups. However, given the widespread value expressed in the focus groups, landowners might not necessarily require a CE agreement to provision wildlife. A positive sign between contract length and CE agreement is also expected, since most states require landowners to enter into a binding, perpetual legal contract in

order to qualify for CE tax benefits. Moreover, a positive expected sign on CE contract length, land protection in perpetuity, is also consistent with intergenerational bequest.

Based upon this body of work, we hypothesize that when landowners believe that a threat to sense of place exists or there is a desire to bequest land to the next generation, landowners are less likely to reject a CE agreement. Past studies do not suggest whether we should expect conservation ethic will have an overshadowing effect on any of these explanatory variables. During the focus groups, landowners ubiquitously self-described themselves as adhering to a conservation ethic in their land management. Will adding the conservation ethic variable encompass intergenerational bequest and other motivations for entering into a CE agreement?

Based upon the previously discussed literature as well qualitative data collected during the focus groups, considerable heterogeneity among landowners is expected. Hence, data analysis for the choice set experiment is constructed to examine the likelihood that an individual would select an easement, (Either A or B), or Neither. To evaluate whether conservation ethic encompasses other dependent variables like intergenerational bequests, two random utility models are estimated.

The following specifications were developed to assess whether landowners were more likely to select a CE (Equation 4), or less likely to select a CE (Equation 5):

$$\begin{aligned}\text{Easement}_{a,b} = {} & \beta_1 \times \text{Easement Length} + \beta_2 \times \text{Public Access} \\ & + \beta_3 \times \text{Wildlife Habitat} + \beta_4 \times \text{Control} + \beta_5 \times \text{Payment}\end{aligned} \tag{4}$$

$$\begin{aligned}\text{UEasement}_{\text{Neither}} = {} & \text{Constant} + \beta_6 \times \text{Age} + \beta_7 \times \text{Gender} \\ & + \beta_8 \times \text{Education} + \beta_9 \times \text{Income} + \beta_{10} \times \text{Percent income from Agriculture} \\ & + \beta_{11} \times \text{Wyoming Resident} + \beta_{12} \times \text{Next Generation} \\ & + \beta_{13} \times \text{Threat to Sense of Place} + \beta_{14} \times \text{Conservation Ethic}\end{aligned} \tag{5}$$

Equation 4 reflects the specification and assessment of the stated choice variables, and Equation 5 reflects the specification and assessment of the other explanatory variables.

A random utility model data analysis with two-tail *p*-values is constructed to test the following hypotheses:

> Ho_1: Agricultural landowners are unlikely to select a CE agreement as a bequest to future generations.
>
> Ho_2: Agricultural landowners are unlikely to select a CE when there is perceived threat to sense of place.

Ho_3: Conservation ethic has no mitigating effect on other variables.

A rejection of the null hypothesis implies that the model has explanatory power. In other words, a rejection of the null hypothesis means that the independent variables explain the likelihood that a landowner will enter into a CE agreement.

Results

Results from both models, run through a random utility model analysis, are presented in Table 5.

As anticipated, the coefficient direction for the easement factors for the choice experiment (length, access to public, control, wildlife habitat, and payment) are consistent with the qualitative focus group results (Keske 2008; Miller et al. 2011) in predicting the likelihood that a landowner will enter a CE agreement. Equation 4 illustrates the likelihood that a respondent will choose either CE A or CE B. A negative sign indicates lower likelihood of choosing a CE.

Not unexpectedly, an increase in financial incentives shown in the variable "Payment Percentage" is robustly and positively correlated with increased likelihood of CE selection ($p < .001$ significance). A term contract of 25 years is strongly negatively correlated with likelihood of entering a CE ($p < .001$ significance), which is also commensurate with the legal requirements of enacting perpetuity in order to qualify for tax benefits (McLaughlin 2018). Granting public access to the land is also negatively statistically significant ($p < .001$ significance), as expected from the focus groups, indicating that requiring public access to the land makes landowners less likely to enter into a CE. Wildlife and maintaining managerial control over the land were not statistically significant, indicating no correlation with CE selection.

The control variables (age, gender, education, income, income percent, and Wyoming resident) and test variables (next gen, threat, and conservation ethic) were loaded in Equation 5. The direction of these expected signs reflects the likelihood that the landowner will select "Neither A Nor B." That is, a negative sign for a control or test variable means less likely to select neither (i.e. more likely to select an easement) and, alternatively, greater likelihood of selecting Easement A or B.

In Model 1, when controlling for easement attributes and basic demographics, Intergenerational Planning (i.e. plans to give or sell land to the next generation) is statistically significant ($p = .04$) and suggests a negative statistical relationship with choosing the "Neither A Nor B" option. In other words, respondents demonstrating plans to bequest land to

Table 5. Results from Random Utility Model Analysis.

Landowner Model Output				
	Model 1		Model 2	
Variables	Coefficient	*p*-Values	Coefficient	*p*-Values
Easement length	–.27636***	.0003	–.27129***	.0004
Public access	–.082625***	.0000	–.82435***	.0000
Wildlife habitat	–.03438	.6501	–.03493	.6452
Control of land	–.08468	.2608	–.08234	.2751
Payment percentage	.01102***	.0000	.01098***	.0000
CONSTANT	1.02103**	.0055	1.88171***	.0000
Age	.02019***	.0000	.02058***	.0000
Gender	.1943	.1281	.21374	.0954
Education	–.16673***	.0000	–.16876***	.0000
Income	.04194	.1136	.04203	.1135
Percentage income from farm	–.00126	.4287	–.00099	.5340
Wyoming resident	.43646***	.0000	.43963***	.0000
Intergenerational succession plan	–.20007*	.0401	–.14239	.1506
Threat to sense of place	–.02458**	.0023	–.01828*	.0267
Conservation ethic	–	–	–.06004***	.0005

***Significant at .001; **Significant at .01; *Significant at .05.

the next generation rather than sell to someone else are more likely to choose an easement option, either A or B. As a measure of internal consistency, this is also consistent with the robust statistical significance of landowners being less likely to enter into a term easement. Hence, the first hypothesis, Ho_1, can be rejected.

The threat to sense of place variable also indicates a statistically significant ($p < .002$), negative relationship that the respondent will select the "Neither" option. This is consistent with the finding that landowners who find threats to sense of place are likely to select a CE, a finding consistent with that of Farmer et al. (2011) and Keske et al. (2017). The second hypothesis, Ho_2, can be rejected.

In Model 2, the analysis is re-run, with the addition of the Conservation Ethic variable. Overall, the estimated coefficients remain largely the same, however a moderating effect was observed on both the Intergenerational Bequest and Threat to Sense of Place variables. Although both maintain the same directional relationship to easement selection observed in Model 1, Intergenerational Bequest is no longer found to be statistically significant. Threat to Sense of Place remains significant but drops

in significance to $p = .04$. That is, when landowner disposition toward conservation behaviors is taken into account, intergenerational bequest is absorbed by conservation ethic. The third hypothesis, Ho_3, can be rejected.

Overall, the models were found to be significant (critical chi-square <.001). The calculated pseudo-R^2 estimates that both explain about 39 percent of the variation in the choice scenario responses and the results are largely consistent with previous analyses of the data (Bastian et al. 2017; Cross et al. 2011; Keske et al. 2017).

Discussion and Conclusions

Results from the random utility model analysis demonstrate that landowners expressing intergenerational bequest, defined as either giving or selling the land to someone in the next generation, are likely to select a CE for land protection. This finding validates that statistically speaking, landowner intent is commensurate with the laws and practices upon which CE polices have been built. This suggests that CE policies can indeed serve as a useful policy tool for the large number of anticipated farmland succession planning situations that loom on the horizon.

Once we control for conservation ethic (i.e. predisposition toward protecting the agricultural land), landowner intergenerational plans are no longer a significant indicator of conservation easement placement. This finding challenges the behavioral theory that underlies many conservation behaviors studies—the TPB or the theory of reasoned action (Ajzen 1991, Ajzen and Fishbein 1980). In TPB, behaviors and choices are more strongly predicted by behavioral intentions than broader cognitions like value orientations or values. In our study, that is not the case. The more proximal cognition, behavioral intention (i.e. intergenerational succession plans) is not more strongly predictive of a behavioral choice (i.e. preferring a CE over no CE). Despite critiques of the causal assumptions and linkages in this theory (Sarver 1983; Shove 2010), TPB has maintained preeminence in conservation studies. Our findings demonstrate that the causal order proposed by Ajzen (1991) that is elaborated upon by others (Vaske and Donnelly 1999), is actually not as universally applicable as many authors claim.

Rather than providing evidence of the cognitive hierarchy proposed in TPB, our results suggest that conservation ethic is a collective and encompassing value that includes a sense of responsibility to future generations, the community, and the land. By demonstrating that conservation ethic is collective and does not separate values from intentions, we provide additional evidence to support Eaton et al.'s assertion (2019:10–11), that "future theoretical and empirical research should explore

whether and how SOP and a conservation ethic construct fit into a more coherent behavioral model for understanding determinants of conservation behavior in working landscapes."

Like Eaton et al. (2019) and Bastian et al. (2020), our findings suggest that a new theoretical framework may indeed be needed and justified. The diversity of items comprising conservation ethic—identity, attachment, and sense of responsibility—point to a mental model more focused on holism than separatism, where land, community, and stewardship are entwined. What theoretical framework might be more aligned? The regenerative development model moves from a fragmented to a whole-systems view, which frames human, ecological, and community well-being as an entwined system (Reed 2007). A regenerative approach is also a place-based approach, which recognizes and values local assets, history, and culture. The implication of our study is that agricultural landowners hold a system's view of their responsibilities that is aligned more with the regenerative development than TPB. As conservation agencies, governments, and researchers seek to engage agricultural landowners in a variety of conservation programs, they may find more success with a regenerative development that considers conservation in more systemic and holistic ways and that intentionally activates their stewardship ethic (Church et al. 2020; Shove 2010). Specifically, agricultural extension agents and educators may have greater impacts with programs that activate experiences and attachments when the community seeks to protect land that is perceived to be of high community value, such as buffer zones or farmland preservation (Thompson and Prokopy 2016). Building a sense of place and sense of attachment may empower citizens to rise into action through grassroots civic engagement and commitment to collaboration so that there is high acceptance of outcomes.

In addition to contributing to the literature on regenerative development and TPB, evidence of the relationship between conservation ethic and intergenerational succession planning contributes to the effervescent discussion among legal scholars about CEs as an exception to dead hand rule. Returning to the earlier quote from McLaughlin (2005), our findings show that landowners who select CE options are likely to show conservation ethic. Since we have shown that this encompasses intergenerational bequest, we assert that once the CE is in place, it is likely that the landowner will manage the property in a way under which the easement continues to provide benefits to the public sufficient to justify its enforcement. While it would be convenient to think that this same landowner would be inclined to bequest the land to others who have the same conservation ethic, evidence shows that this is not necessarily

the case. CE contract violations, often in the form of illegal building, are more likely to happen with property transfers (McLaughlin 2013).

In the decade that has transpired since our data were first collected, the U.S. Tax Court has continued to refine its interpretation of IRS tax code 170(h) that articulates conservation values. The IRS markedly stepped up its practice of CE audits in 2005, the first year that our qualitative data were collected. Since that time, the U.S. Tax Court has continued its review of cases, and specific financial benefits have become more clearly articulated. However, the way in which agricultural landowners view intergenerational land transfers, and the barriers to implementation, have remained rather consistent (Conway et al. 2016). Policy risks, loss of identity, and polarizing intergenerational perspectives may stall land transfers (Conway et al. 2016). Scholars have noted that incumbent landowners may be at odds with presumptive heirs over technology and environmental goals (Leonard et al. 2020). Policy risks abound that make estate planning cumbersome and create additional financial and human risks. Taxation, retirement income, long-term care cost, marital breakdown, and other motivations may prompt landowners to retain ownership (Leonard et al. 2020).

In order to engage in a successful CE stewardship arrangement, it is critical for landowners to find a conservation organization with whom there is shared mutual interest. This may work for the original landowner, but the relationship will continue with subsequent landowners when the property is transferred. Another theme that emerged in the focus groups was that conservation ethic may reflect different land management actions that may or may not align with land conservation organization priorities (Cropper et al. 2012). Hence, a natural extension of our research might be to examine conservation ethic and intergenerational bequest within those who have either inherited or purchased land with CEs. Achieving an understanding of conservation ethic among those on the receiving end would provide a great deal of insight about what to expect in the next wave of agricultural landowners.

By substantiating the relationship between conservation ethic and intergenerational bequest, we believe that our findings validate Vaske et al.'s (2018) study, which indicates that farmers possess a mutualism orientation toward land management and embody behaviors that protect the land, often irrespective of financial gain. While authors have found that landowners require compensation to engage in conservation practices (Osmond et al. 2012), our findings of intergenerational bequest provide insight into situations when financial benefits may be a secondary factor, like others before us have suggested (Farmer et al. 2011). One limitation of our data is that is does not include tenant farmers and producers. Our

findings are consistent with other studies (Eaton et al. 2019; Vaske et al. 2018) that do include farmers who are not landowners and explore the other types of conservation practices in working lands (Prokopy et al. 2019). Thus, our findings suggest that future studies should examine how conservation ethics might support the growing movement toward regenerative agriculture, which is built on a different mental model than productivism agriculture (Schreefel et al. 2020).

One limitation of this study is that its scope is limited to landowners. As agricultural land is increasingly operated by tenants rather than owners, future research ought to explore the growing disparities between owner and tenant operators with respect to implementing regenerative practices on the landscape. As agricultural land ownership increasingly transitions to landowners who aren't farmers or agricultural operators, additional research is needed to examine tenant farmer motivations for conservation adoption, and decision making. Studies (Cox 2010) have documented that lease arrangements add another dimension of complexity in the decision-making processes for implementing conservation practices. Specifically, lease terms have been found to influence soil health practices adopted by tenant operators, and strict cash rent agreements may lead tenant operators to focus on maximizing productive output. Longer term leases and ones that outline cost and revenue sharing may reduce barriers to engage in soil health or other conservation practices (Cox 2010). Additionally, future research should investigate whether the conservation ethic of tenants and landlords can serve as leverage for negotiating lease agreements that enable regenerative agriculture.

In sum, we conclude that landowners' attitudes toward environmental conservation can envelop desires to secure access to working lands for the next generation. That is, our findings suggest that attitudes toward conserving the land imply an underlying intention to preserve farmland, intergenerational access, and productive quality. As large quantities of land begin to transition to new owners, we will undoubtedly begin observing the implications of CE agreements shaping land use for the next generation. Amid recent market volatility, largely due to trade tensions between China and the U.S. coupled with the ongoing COVID-19 pandemic, the legal protections offered by CE agreements may prove to be an effective means of weathering current economic uncertainties as well as preserving future generations' access to agricultural lands.

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