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**Evaluation of Landowner Perceptions of Participating in Conservation Easements in the
Beaver Lake and Illinois River Watersheds: Motivators and Barriers**

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Abstract

Conservation easements (CEs) are an effective way to protect natural resources with minimal impact on the daily activities of landowners (LOs), but there is still resistance to CE adoption among landowners in Northwest Arkansas and Northeast Oklahoma. Therefore, there is a need to characterize LOs' perceptions of CEs in these regions and adjust easement organization programming accordingly. This study followed a non-experimental, exploratory survey research design to gather information regarding demographics, awareness, attitudes, and preferences of LOs in the Beaver Lake and Illinois River watersheds. Likert-scale survey responses were assigned numerical values and averaged to find Pearson correlation coefficients between variables of interest. Descriptive statistics were used to provide an overview of survey responses. Seventy-seven LO responses were analyzed, finding that while attitudes towards conservation easements are generally positive, awareness of specific CE organizations is low, and misconceptions may exist regarding perceived disincentives of CEs. Survey results indicated that as awareness of CE programs increases, perceived CE risks decreases, suggesting a need for clear and comprehensive CE information to be easily accessible to LOs to encourage CE adoption. Also indicated in survey results was the relative importance of "shared interest" motivators relating to conservation and technical assistance over "self-interest" financial motivators such as tax reduction or payments. Additionally, there were observed differences in CE perceptions depending on LO demographics, suggesting easement organizations may need to adjust CE programming depending on the LO population of interest.

Introduction

Background and Need

Northwest Arkansas is an area of increasing conservation concern, as the Fayetteville-Springdale-Bentonville-Rogers urban area grows at incredible rates. With a growing population comes increased pressures on the natural resources of the region, including conversion pressures on agricultural land, sub/urban sprawl threatening wildlife habitat fragmentation, and increased use and pollution of surface water resources. Northwest Arkansas contains portions of two main watersheds, the Beaver Lake watershed, and the Illinois River watershed. Beaver Lake is the drinking water source for over 350,000 Arkansans (BWD, 2023), and the Illinois River provides recreation activities in Arkansas as well as Northeast Oklahoma, where the river is designated as a scenic river. Both watersheds face similar conservation challenges, including over-sedimentation of waterways and elevated nitrogen and phosphorus levels, which can cause harmful algal blooms and cultural eutrophication, but little has been done to examine differing attitudes of landowners in each of the watersheds. Proactive conservation efforts are needed in this region to address water resource degradation, rapid loss of valuable agricultural land, and to prevent habitat fragmentation in suburban areas. However, rural landowners are often wary of government involvement in their activities on private land. Thus, a variety of non-governmental organizations have been formed in the region that use a variety of conservation techniques to address the discussed concerns.

One technique used by organizations to address local conservation concerns is a conservation easement (CE). Conservation easements are voluntary, legally binding agreements between a landowner and a third-party organization, such as a land trust, that restricts the use of

privately owned property to protect its conservation value (NCED, 2023a). Conservation easements are custom to every easement holder organization and landowner and can be used to address a vast array of environmental concerns often without having an impact on the daily lives of landowners. Although over 35 million acres of privately-owned land are under a conservation easement in the United States compared to two million acres in 1995 (NCED, 2023b), there is still resistance to CEs in the region of Beaver Lake and Illinois River watersheds (L. Kindberg, personal communication, July 2022).

Just as every CE is unique, there are a variety of motivators and barriers that landowners consider when contemplating an easement. Motivators can include financial incentives, access to technical advice/services, and a strong feeling of stewardship. Barriers can include financial burdens, time obligations, or resistance to changing land management practices. These motivators and barriers have been analyzed in other areas of the United States (Kemink et al., 2020; Tanguay, 2021; Farmer et al., 2015; Effa, 2009), but little to no research has been done to identify the motivators and barriers specific to landowners in Northwest Arkansas/Northeast Oklahoma. This study was intended to investigate what stands between landowners and agreeing to a CE.

Problem Statement

Conservation easements are an effective way to protect natural resources with minimal impact on the daily activities of landowners. However, the implementation of conservation easements has struggled to gain popularity among landowners in the Northwest Arkansas/Northeast Oklahoma region, according to local conservation organization staff (L. Kindberg, personal communication, July 2022). Possible barriers to participation include

inflexibility in easement duration, inadequate financial compensation, and/or negative attitudes toward easement holders (i.e., governmental organizations, land trusts, other non-profits, etc.).

Purpose Statement

The purpose of this study was to identify and analyze perceived motivators and barriers that landowners face when considering participation in a conservation easement in the Illinois River and Beaver Lake watersheds of Northwest Arkansas and Northeast Oklahoma and to adjust easement programming accordingly to address and reduce relevant barriers.

Research Objectives

This study was guided by the following objectives:

Objective 1: Characterize existing conservation easement programs through web-based research and phone calls with experts in the field

Objective 2: Characterize landowners' perceptions of motivators and barriers to participating in conservation easements, including:

1. Demographic information
2. General attitudes and awareness related to conservation and related initiatives
3. Perceived risks & benefits of participating in a CE
4. Preference for financial incentives vs. "capacity building"
5. Preference for easements under differing conditions (term length, payment amount, etc.)

Objective 3: Develop easement communication and programming recommendations based on survey results and existing literature

Limitations

This study is limited by the number of landowners surveyed. Their responses are unlikely to be fully representative of the demographics of all landowners in both watersheds in Northwest Arkansas and Northeast Oklahoma, and responses are unlikely to be distributed equally across each county of interest. The survey also identified relevant responses using counties, not watersheds, meaning some responses may have been from landowners outside the watersheds of interest. Additionally, participants who responded to the survey may already have prior positive experiences or knowledge of conservation easement programming.

Definitions

Conservation (as defined in the survey): the act of protecting land's natural resources for current and future generations

Conservation easement (as defined in survey): A voluntary, legal agreement between a landowner and a qualified easement-holding organization, such as a non-governmental land trust or watershed protection/conservation organization, or a government agency, that limits uses of the land to protect its ecological, agricultural, and/or historical value

Easement holder: a land trust, governmental agency, or historic preservation organization (Byers & Ponte, 2005)

Watershed: an area of land that drains all surface water to a common outlet (USGS, 2019)

Literature Review

This study sought to identify motivators and barriers faced by landowners when considering participation in conservation easement (CE) programs and to develop programming in a way that addresses and reduces these barriers. What must first be addressed is the need for successful CE programs in Northwest Arkansas and Northeast Oklahoma, an overview of easements in general, an overview of existing CE programs in the region, and barriers landowners have faced as documented in the existing literature. Existing literature on both failed and successful CE programs in the United States provided the basis for this study, as motivators and barriers are likely similar in various regions.

Water Resources and Degradation

Northwest Arkansas is one of the most rapidly growing areas in the U.S., with a 10-year population growth rate of 21.1% in Washington County and 28.5% in Benton County compared to the Arkansas average of just 3.3% increase (U.S. Census Bureau, 2021), mainly in the urban/suburban areas of Fayetteville, Springdale, Bentonville, and Rogers. With large rates of population growth, more pressure is placed on the local natural resources, as more and more residents require clean drinking water and green spaces to recreate. Both the Beaver Lake and Illinois River watersheds face concerns regarding the degradation of water resources that various conservation management practices can be used to address.

Beaver Lake is a drinking water reservoir supplying water to over 350,000 Arkansas residents, including residents of Fayetteville, Springdale, Bentonville, and Rogers (BWD, 2023). Drinking water originating from Beaver Lake must meet standards set by the 1974 Safe Drinking Water Act enforced by the Environmental Protection Agency (EPA, 2015b). To ensure safe, affordable drinking water for residents, it is vital to understand environmental pressures from

across the watershed that impact water quality of water sources of Beaver Lake and its tributaries.

Although much of the Beaver Lake watershed remains forested (Figure 1), about 27% of the area is pastureland (Giovannetti et al., 2013), with the primary agricultural activities being cattle and poultry management. Haggard et al. (2003) showed that, in the Beaver Watershed, there was a positive correlation between the percentage of pastureland and stream nitrate and soluble reactive phosphorus, both of which are often limiting nutrients for algal growth in reservoirs. As algal growth increases in reservoirs, such as Beaver Lake, the taste and odor of drinking water can be affected, increasing strain on water treatment facilities (Giovannetti et al., 2013), as well as impacting tourism/recreation on Beaver Lake with the effects of eutrophication.

Excess inputs of nitrogen and phosphorus into Beaver Lake are largely due to the prevalence of poultry farming in the watershed. As of 1995, the Beaver Lake catchment area contained roughly 2,000 poultry houses, producing about 200,000 Mg of total animal waste per year (Haggard et al., 2003), which has large amounts of both nitrogen and phosphorus. It is common in this region to apply poultry waste, or litter, to pasturelands as fertilizer, making the associated nutrients susceptible to erosion and subsequent incorporation into the water column (Haggard et al., 2003). Between 1965 and 1985, the application of fertilizer in the White River basin increased by 77% for phosphorus and 200% for nitrogen (Alexander & Smith, 1990), greatly increasing the amount of nutrients capable of entering surface water bodies. Additionally, the presence of karst features in the region means that contamination of groundwater is more likely in the Beaver Lake watershed than in other regions.

The other main watershed in Northwest Arkansas is the Illinois River watershed (Figure 2). Although the Illinois River is not associated with an Arkansas reservoir like the White River,

the Illinois River flows into Oklahoma where it is designated as a scenic river and is the primary inflow source to Lake Tenkiller in Oklahoma, a reservoir that is used for recreation, water supply, and hydroelectric power generation (Wells et al., 2012). The Illinois River is currently listed on the U.S. Environmental Protection Agency's 303(d) list of impaired water bodies for elevated phosphorus levels, and Illinois River tributaries, such as Osage Creek, Muddy Fork, and Spring Creek, are on the 303(d) list in Arkansas for elevated phosphorus and presence of harmful bacteria (EPA, 2015a).

As of 2010, the Illinois River watershed is described as 46% pastureland, 41% forested land, and 13% urban (Haggard et al., 2010). The contrast in the percentage of land altered from its natural forested state is striking comparing land use in the Illinois River watershed (Figure 2) and the Beaver Lake watershed (Figure 1). The increased percentage of agricultural and urban land places greater environmental pressure on the Illinois River. Additionally, the Fayetteville-Springdale-Rogers-Bentonville metropolitan area continues to grow, with the population of Benton and Washington Counties almost doubling between 1990 and 2007 (U.S. Census Bureau, 2007). The Illinois River watershed faces similar conservation challenges to the Beaver Lake watershed, but combined pressures from increased pastureland, urban expansion, and Oklahoma water quality standards create a different set of concerns for involved stakeholders.

The main contaminants of concern in the Upper Illinois River watershed are sediment in forested areas and nitrogen, phosphorus, and sediment in pastureland and urban areas (Haggard et al., 2010). Of particular concern is the addition of excess phosphorus into tributaries of the Illinois River, as the current phosphorus levels cause the Illinois River to be considered impaired in Oklahoma. As in the Beaver Lake watershed, phosphorus-rich poultry litter is often applied to pastureland in the Illinois River watershed. Historically, applying poultry litter was primarily to

meet the nitrogen needs of plants, while simultaneously applying much more phosphorus than can be utilized. The result is the mobilization of phosphorus, especially during storm events, introducing excess P to the surface water (Haggard et al., 2010). Elevated phosphorus levels can lead to increased populations of opportunistic algae, which deplete dissolved oxygen when decomposing, affecting the quality and/or taste of drinking water, and producing toxic substances in some instances (Stevenson & Rollins, 2006), impairing recreational and drinking water uses in both the Oklahoma and Arkansas portions of the watershed.

In addition to phosphorus-rich runoff water during storm events, sediment and sediment-bound phosphorus and nitrogen enter the waterways of the Illinois River watershed from streambank erosion. A 2020 study funded by the Illinois River Watershed Partnership (IRWP) showed that streambanks in the upper Illinois River watershed erode at an average rate of 3.88 feet of streambank per year, and eight out of 15 study sites had High, Very High, or Extreme Near Bank Shear Stress, meaning these sites were likely to continue eroding at an accelerated rate in the future (NSS, 2020). The sediment lost from the streambanks enters adjacent waterways and alters turbidity levels, which can be detrimental to sensitive aquatic organisms. In addition to harmful impacts on aquatic life, the loss of topsoil as streambanks rapidly erode is an economic loss for producers, as valuable farmland is carried downstream.

Local organizations can employ a variety of tools to address the conservation concerns introduced here. One tool becoming more common in conservation efforts is the use of a conservation easement. An easement is generally intended to limit the uses of privately-owned land to protect some valuable ecological quality. Conservation easements can be used to preserve green spaces for future generations in urban/suburban areas as urban areas expand, which is especially useful in rapidly growing areas such as Northwest Arkansas. Conservation easements

can also be used to protect valuable farmland from development and preserve historic landmarks with significant cultural value. In addition, conservation easements used in conjunction with best management practices and technical services and expert advice, often provided by the easement holder organization, can be used to address a variety of conservation concerns, including streambank erosion and loss of nutrients to surface water.

Conservation Easements Overview

As defined in this study, a conservation easement is a voluntary legal agreement between a landowner and a qualified easement-holding organization, such as a non-governmental land trust or watershed protection/conservation organization, or a government agency, that limits uses of the land to protect its ecological, agricultural, and/or historical value. As the definition implies, a conservation easement can be utilized to meet a variety of goals, both for the landowner and the easement-holding organization. The most common purpose of a CE is to limit the future development of relatively undisturbed land. However, CEs can also be used to ensure productive agricultural land is continued to be used for agriculture in perpetuity (Miller et al., 2010), as well as protect historical landmarks from changes in management that switching ownership might cause (AHPP, 2023). Conservation easements are rarely one-size-fits-all, and easement agreements are usually tailored to fit the specific needs of a landowner and their land.

Enrolling in a CE program does not mean that the land ownership has been transferred to the easement holder. The original landowner retains the rights to continue using the land, and any restrictions upon use must be agreed upon by both the landowner and the easement holder. In addition, the conservation easement is tied to the land itself, not the owner, meaning that as the land changes ownership the easement terms continue to apply (NCED, 2023a). Easements

are often held in perpetuity, or as long as is reasonable when considering the longevity of the easement-holding organization, changing conditions of the land, etc. However, some CE programs offer easements of shorter lengths, generally 30 years.

Easement-holding organizations can be a part of national or local governments, such as the Natural Resources Conservation Service (NRCS), or a 501(c)(3) non-profit organization, such as a land trust. A land trust is a form of non-profit organization that works to conserve land by either acquiring acreage outright to be designated as a nature preserve or similar area or placing conservation easements on privately-owned land to prevent future development and/or subdivision. Like CEs themselves, easement-holding organizations vary greatly depending on the local need. Non-profit organizations generally rely on donated easements and/or parcels of land sold at bargain prices to contribute to their protected acreage, while governmental organizations, such as the NRCS, may be able to offer landowners payments (per acre per year) for the adoption of a CE and/or cost-sharing programs to help fund related conservation activities.

What is referred to as the “value” of a conservation easement is the difference between the fair market value of a piece of land, and the lower resultant market value if development/subdivision is prohibited, or the “conservation value”. This value is basically what the landowner and descendants would lose because of placing an easement on their land. However, in the case that the easement value is donated by the landowner, that lost value is then tax-deductible, and the estate tax is lowered to reflect the limited development that can take place on the land. Often, this allows landowners to ensure that their heirs can afford to keep the land in its current state instead of needing to sell or subdivide the land. The financial incentive, along with lump-sum payments offered by some organizations, is the primary external motivator for landowners to enroll their land in an easement.

CE Programs in Beaver Lake & Illinois River Watersheds

Of the existing literature on CE programs in the U.S., Effa (2009) seemed to be the only research conducted in Arkansas regarding landowner perceptions of CEs. However, Effa (2009) did not provide a list of easement organizations in existence at the time, and there still seems to be no single source listing such organizations in Arkansas.

A review of information available about conservation easement organizations in the Northwest Arkansas and Northeast Oklahoma region resulted in the identification of several existing organizations. Land trusts and other conservation organizations that hold easements in the Illinois River and Beaver watersheds include the NRCS, Northwest Arkansas Land Trust, Ozark Land Trust, The Nature Conservancy, Arkansas Natural Heritage Commission, Grand River Dam Authority, Land Legacy, and the Humane Society Wildlife Land Trust (HSUS, 2023). All organizations, but the Humane Society Wildlife Land Trust, were contacted through phone calls to verify information present on websites and to gather more information than what was available online. Of the organizations contacted, all were primary easement holders. Unless otherwise stated in the descriptions below, easement terms do not require public access to land under a CE.

Natural Resources Conservation Service

The NRCS, which has a physical office in Washington County, offers two CE programs, the Agricultural Conservation Easement Program (ACEP) and the Healthy Forests Reserve Program (HFRP) (NRCS, 2023). The Agricultural Conservation Easement Program offers easements for both agricultural land and wetland areas. Up to 50 to 70% of the conservation

easement cost is covered by the NRCS for the agricultural land component of ACEP, and up to 100% of the cost is covered for easements on wetlands. Both programs offer easements of perpetual length, or the maximum term length allowed by law, with 30-year easements offered for wetlands. In addition, all fees associated with enacting an easement are covered by the NRCS for wetland easements (NRCS, 2023). Although the NRCS has the largest capacity for funding the purchase of easements and providing landowners with technical assistance, the NRCS holds no agricultural conservation easements in Arkansas and only a couple of wetland easements in Northwest Arkansas. The NRCS offers the most extensive technical assistance to landowners, including soil sampling, water control structures, manure storage and application, development of nutrient management plans, exclusion fencing, and alternate livestock water resources. A lifespan is assigned to every technical solution put in place by the NRCS, and the landowner is responsible for maintenance until the lifespan has expired, at which point the landowner may reapply for continued NRCS funding (K. Neil, personal communication, July 18, 2022). Both the NRCS and the U.S. Forest Service offer easement programs for forested land, the Healthy Forest Reserve Program and the Forest Legacy Program, respectively (USFS, 2017).

Northwest Arkansas Land Trust

The Northwest Arkansas Land Trust (NWALT) holds several easements in Benton and Washington Counties, all of which are perpetual. All but one of NWALT's easements were donated. If funds are available through either private donations/fundraising or state/federal grants, the NWALT has the opportunity to purchase select easements. Due to its status as a non-profit, NWALT does not offer financial compensation in the form of landowner payments. As such, the primary incentive for enrolling in a CE with NWALT is the potential for state or

federal tax deductions. The non-profit status of the NWALT, and other similar organizations, allows for donations of easements to be tax deductible for up to 15 years under the Conservation Tax incentive, providing a substantial financial incentive for landowners. There are no criteria for NWALT to consider placing a property under an easement, but there are several factors of conservation value that are taken into consideration. Technical services that NWALT offers to landowners generally consist of professional advice and suggestions of best management practices tailored to the characteristics of the property. The NWALT can then refer landowners to partner organizations, such as the Beaver Watershed Alliance or the NRCS, which can provide hands-on technical assistance through cost-share programs. In general, the main concern of landowners, as identified by the NWALT, in Northwest Arkansas is streambank erosion, which technical services, such as fencing to keep livestock from surface water resources or installment of riparian buffers, for example, may help to address. The NWALT is the only accredited land trust in Arkansas, meaning NWALT is verified through the Land Trust Alliance to adhere to high land protection standards, including having plans in place to uphold easements in perpetuity (P. Nelson, personal communication, July 19, 2022).

Ozark Land Trust

The Ozark Land Trust (OLT) holds perpetual easements only. THE OLT is a land trust created to protect areas in the Ozarks region of Southern Missouri and Northern Arkansas, and, according to their website, OLT holds 244 acres of CE land in Washington County, AR (OLT, 2023). Activity restrictions on OLT easements primarily prevent development, and most of the land targeted/acquired under easements is forested land. No payments or cost-share are available for landowners, and landowners generally donate the value of the easement or purchase the

easement. Landowners submit applications to enter into a CE with OLT, and their properties are prioritized based on acreage and contiguous land, for example (A. Cyr, personal communication, July 11, 2022).

Nature Conservancy

The Nature Conservancy holds perpetual easements only. Easements are not typically purchased by the Nature Conservancy unless an outside source of funding is available, such as a federal grant or a private donor with a specific conservation area of interest. In general, the Nature Conservancy relies on conservation easement donations or fee-simple acquisition of land. In some cases, the Nature Conservancy will refer landowners to the NRCS to seek funding for conservation easements and/or technical assistance. Little marketing of CEs is conducted by the Nature Conservancy to encourage landowners to participate in easement programs; easement donors generally come to the organization themselves. In special cases, the Nature Conservancy may approach a landowner with a property of especially significant conservation value, but this is not generally the case. Although the Nature Conservancy does not have strict eligibility requirements for CEs, properties with certain characteristics are prioritized. Riparian easements are of greater priority, as are properties with high-quality habitat for a large range of species, as well as climate-change-adaptation areas. Limited technical assistance services are sometimes offered with easement agreements, where this generally consists of erosion control in various forms as the most popular form of assistance with landowners. Examples of services provided include streambank erosion control, assistance with road construction planning to limit erosion, and assistance in the selection of plant species to meet various goals of the landowner. In

general, no funding is available for the maintenance of technical easement solutions (A. Metrailler, personal communication, July 15, 2022).

Arkansas Natural Heritage Commission

The Arkansas Natural Heritage Commission (ANHC) is a subset of the Arkansas Heritage Commission, a state agency with governmental authority. Existing easements in Northwest Arkansas are perpetual and have been purchased with a one-time payment to the landowner. Although the ANHC will occasionally provide land management assistance and maintenance funding for some easement grantees, the technical and financial services are somewhat limited and ANHC will direct landowners to other cost-sharing programs as well. Unlike most other easement organizations in the region, ANHC does require public access as part of their CE requirements (R. Spotts, personal communication, July 28, 2022).

Grand River Dam Authority

The Grand River Dam Authority (GRDA) operates in the Illinois River watershed in Oklahoma, where the river is designated a scenic river. Most of the GRDA's easements are 30-year easements, with a few exceptions of perpetual easements, and one 20-year easement. Although the majority of the easements held with GRDA are on riparian parcels, upland areas with unique conservation needs are also considered. Hunting, fishing, and existing forestry operations are permitted, within reason, on easement land under the GRDA, and some landowners have experienced substantial financial gain from commercial hunting operations using the improved wildlife habitat under easement terms, especially wetland/riparian habitat for migrating waterfowl. Payments for conservation easements under GRDA are generally \$75 per

acre per year, and 100% of the easement payment is given to the landowner up front. For example, if a landowner enrolls 200 acres of land in an easement for a term length of 30 years, \$450,000 ($\$75 \times 200 \text{ acres} \times 30 \text{ years}$) is offered to the landowner up front. In the case that the landowner decides to terminate the easement, there is no financial penalty; the landowner simply must pay the GRDA the remaining balance of the up-front lump sum based on how many years of the term length the easement was upheld. Technical services offered by the GRDA are primarily those of professional advice and referral to “sister agencies” that can assist, such as the Oklahoma Conservation Commission. Obligation for maintenance of the services provided is then passed onto the sister agencies. Common easement solutions among landowners served by the GRDA include fencing for livestock, establishing off-stream watering for livestock, such as tire watering stations or a constructed pond, tree planting, soil sampling, and invasive species removal. The solutions also benefit the goals of the GRDA by improving water quality, erosion control, and wildlife habitat quality (E. Fite, personal communication, July 18, 2022).

Land Legacy

The Land Legacy is the only statewide land trust in Oklahoma, and they hold 24 perpetual conservation easements in Delaware County, Oklahoma. The Land Legacy targets land in the Lake Eucha watershed in Delaware County, as the lake is a main drinking water source for the city of Tulsa. As such, the city of Tulsa has funded the purchase of many of the Land Legacy’s easements in Delaware county, with all other easements having been donated. The Land Legacy does not purchase easements itself or offer landowners financial compensation at this time (J. Rhodes, personal communication, July 19, 2022).

Although many easement-holding organizations in the Northwest Arkansas/Northeast Oklahoma region have been relatively successful in their endeavors to establish easements on lands of interest, there are little to no documented efforts to identify and analyze landowner motivations in the Beaver Lake and Illinois River watersheds, and this documentation is necessary to increase the success of CE programs in the region.

Motivators for Participation

Dual-interest theory, as described by Czap et al. (2012), describes motivators for engaging in a certain behavior as being categorized into either self-interest motivators or shared-interest motivators. Vizek (2016) applied these two categories of motivators to private land conservation, primarily describing self-interest motives to be those of monetary value, such as payments and/or tax cuts, and shared-interest motives to be those relating to strong feelings of environmental stewardship. Farmer et al. (2015) provided a more comprehensive list of potential motivators that may encourage a landowner to place a conservation easement on their land, which include financial motives, place attachment, environmental motives, seeing land development, societal motives, desire to protect open space, family heritage/legacy property, and cultural motivations.

While Farmer et al. (2015), Hemby et al. (2022), and informal preliminary conversations with conservation organization staff emphasize the importance of financial motivators, Kemink et al. (2020) suggested that financial incentives are a short-term solution to the long-term issue of conservation, and that easement organizations can “crowd out” internal conservation values by focusing on monetary incentives for landowners. In addition, Tanguay et al. (2021) reported that landowners preferred “capacity building” over financial gain regardless of attitudes/values, based

on an analytical literature review. Tanguay et al. (2021) described capacity building to be technical solutions and advice easement organizations can offer landowners, as opposed to tangible monetary gain. Technical solutions included in the capacity building aspect of CEs can be the implementation of best management practices, like supplying alternative water sources to keep livestock from trampling streambanks, providing fencing to support rotational grazing, installment of riparian buffer zones, as well as services more focused on wildlife habitat, such as tree species selection and planting. Technical solutions address both self- and shared-interest and therefore provide considerable overlap between the goals of the landowner and the easement organization, as well as producer goals of production and stewardship (Thompson et al., 2014).

While it is suggested in much of the literature that motivators focused on shared-interest and/or capacity building are more important than financial incentives, monetary gain cannot be ignored completely. For example, Farmer et al. (2015) showed that landowners who have an economic dependence on their land consider financial incentives to be more important than landowners who do not. This means that demographic information and primary land use must be considered as well. In addition, Hemby et al. (2022) reported a negative correlation between both size of the land owned, and the amount of time owned and the likeliness of a landowner to adopt a CE, suggesting these demographic variables may play a role in who is more likely to consider a CE. These results were supported by Stroman et al. (2017), who reported that easement-enrolled landowners were more likely to be younger, more highly educated, less likely to own rural property for primary residence, and have owned land for a shorter amount of time than landowners not enrolled in an easement on their land.

Barriers to Participation

For every factor that may encourage a landowner to consider a CE, there is a competing barrier. For example, while some landowners wish to preserve their family land for their descendants, some landowners feel that placing a perpetual easement on their land can negatively limit the ability of their heirs to make decisions regarding management decisions (Miller et al., 2010). In this instance, modifying easement structure to include shorter-term lengths may open opportunities for more landowners to consider participating in easement programs. In addition, just as financial compensation is a significant motivator for some landowners, Vizek (2016) identified concerns about inadequate financial compensation as an important factor when considering a CE. Miller et al. (2010) also identified significant concerns about easement programs requiring public access to the land under easement and that enrolling land in an easement would lead to loss of managerial control. The concern about public access is less of a concern in the Beaver Lake and Illinois River watersheds, as most easement organizations interviewed did not require public access as part of their easement terms. However, clear communication/advertisement from easement organizations may help to address this perceived barrier.

Landowner concerns that a CE would lead to a loss of managerial control is potentially a larger and more complex example of a common barrier. While some landowners said they would consider an easement if the only limitation was that the land could not be subdivided (Miller et al., 2010), lacking the ability to limit certain activities on the land may render an easement practically useless to the easement-holding organization. Similarly, Bastian et al. (2017) reported a lack of trust for the land trust/easement organization to be a concern of landowners who are concerned that land trusts may not have the landowners' best interests in mind.

The simplest of the barriers that landowners face when deciding to participate in a CE program may be one of the most overlooked, which is that landowners can't consider enrolling their land in an easement if they are unaware of easements and/or easement organizations in the first place. Vizek (2016) showed that, as awareness of CE programs increased among respondents, the perception of risks involved with CEs decreased, which suggests that an important factor in encouraging landowners to participate in CE programs involves ensuring landowners have accessible and accurate information regarding easements. This may be especially important in this study, as Effa (2009) reported that the majority of respondents among Northwest Arkansas landowners were neutral towards factors meant to be encouraging in enrolling land in a CE. As this study seems to be the only investigation of landowner attitudes toward CEs in Northwest Arkansas/Northeast Oklahoma, there is a clear need to expand research efforts regarding landowner motivations and barriers in the region.

To fully address the protection of at-risk lands in the Beaver Lake and Illinois River watersheds, it is crucial to evaluate landowner attitudes toward conservation easement programs in the area and identify common barriers faced when deciding to participate in such programs. This study aimed to investigate landowner attitudes, motivators, and barriers through the use of survey and interview instruments to collect both quantitative and qualitative metrics to guide easement holders' programming and outreach methods.

Methodology

The methodology for this study was designed to gather as many responses as possible from landowners in the Illinois River watershed and Beaver Lake watershed areas in Northwest Arkansas and Northeast Oklahoma. The goals of the study warranted the use of both quantitative

and qualitative measures, as general trends in motivators and barriers to easement participation were investigated, as well as specific case studies that illustrate the personal experience of landowners with conservation easements. While this study focused on the quantitative survey results, interviews were conducted as part of a larger study (Cooper, 2023) that explored the related qualitative results.

Research Design

This study followed a non-experimental, survey research design using an exploratory mixed-methods approach to investigate both quantitative and qualitative aspects of landowner motivators and barriers to participating in conservation easement programs. Mixed-methods approaches are used to discover patterns, test hypotheses, and extrapolate results to larger populations (Johnson & Onwuegbuzie, 2004), all of which were vital to this study to understand landowner attitudes toward conservation easements and adjust programming according to results. Quantitative results were obtained from an electronic survey sent to participants, and qualitative results obtained from associated interviews were used to clarify and expand upon results from the survey. Results from interviews were not analyzed as a part of this study but were instead used to expand upon survey results and provide specific communication recommendations from landowners, as seen in Cooper's (2023) study.

Population and Sampling

The population of interest for this study was at least 90 landowners with property located in the Illinois River or Beaver Lake watersheds in Arkansas and Oklahoma. Specifically, the target population was landowners in Benton, Washington, Madison, Carroll, & Crawford

counties in Arkansas, and Adair, Delaware, Cherokee & Sequoyah counties in Oklahoma. A group of partner organizations- Illinois River Watershed Partnership, Beaver Watershed Alliance, Grand River Dam Authority, and Northwest Arkansas Land Trust- was the source of the sampling population, using their existing mailing lists to distribute the survey and information about the study. Partner organizations that sent the introductory email to participants were told that landowners with riparian/floodplain land were a priority, but landowners with upland properties were also included in the target demographic, since upland activities can impact surface water quality. The goal of the study was to contact landowners with varying parcel number and size, and a mix of landowners/managers already engaged in conservation easement programming as well as those who do not have an easement on their property. These specifications were included in the introductory email sent to partner organizations to guide their outreach efforts to potential participants.

Rigor

Validity in this study was preserved primarily through a pilot test of the survey instrument used to gather responses from landowners within the Illinois River and Beaver Lake watersheds. Survey items were first reviewed by experts in the watershed protection field to ensure the questions would result in the information of interest. Any relevant changes to the survey items were then implemented using feedback from both advisory board members and faculty advisors. Another component of the rigor of this study was the inclusion of definitions of relevant terms in the survey itself. Definitions were provided for the terms “conservation” and “conservation easement” after participants were asked to rate their understanding of a CE. Providing definitions to participants was done to ensure that the landowners were familiar with

the concepts they were being asked to comment on and to eliminate any errors associated with uninformed responses.

Instrumentation

This study was conducted using a Likert-scale survey to categorize differing attitudes of landowners in the Illinois River and Beaver Lake watersheds toward conservation easement programs. The Likert scale is a popular survey type used in social sciences that categorizes respondents' attitudes using a five to seven-option scale, usually ranging from "strongly disagree" to "strongly agree" (Darity, 2008). Likert-scale responses can be analyzed as quantitative data by scoring responses in terms of favorability. A positive prompt with an answer of "strongly agree" would be scored as a 5 on a scale from 1 to 5, for example. The survey also included open-response questions to gather demographic information and to obtain permission to follow up with landowners for the administration of more in-depth qualitative questions. The survey instrument was 29 questions long, where 23 of question responses were analyzed for this study and was estimated by researchers and advisory board members to take roughly 10-15 minutes to complete.

The survey instrument was researcher-developed but drew on established themes for motivators and barriers identified in the literature, primarily the studies of Effa (2009) and Farmer et al. (2015). A pilot study was conducted to ensure the survey questions were as easy to understand as possible and would gather data that would be useful to conservation organizations in the area. The survey was sent to members of the advisory board, including staff members of IRWP, BWA, GRDA, NWALT, and the University of Arkansas, before being sent to potential respondents. Advisory board members completing the pilot study were asked to evaluate the

survey instrument for errors in content, accessibility, and coherency and the survey was modified based on feedback before being opened for data collection.

Data Collection

Introductory emails were sent to landowners by partner watershed-protection organizations, such as IRWP, BWA, GRDA, and NWALT. The emails included an overview of the study, the contact information of the investigators, and the link to the survey. The software Qualtrics (ver. August 2022, Qualtrics, Provo, Utah) was used to develop and deliver the survey in an electronic setting. A reminder email was sent out, in the same manner, a week after the introductory email, and the survey was closed a week after the reminder email was sent. The survey included demographic information from participants as well as their current understanding of CEs, factors that would encourage/discourage them to engage in a CE, technical services of interest, and preferred easements terms. A smaller subset of landowners was selected from survey respondents, if contact information and permission to contact was obtained through the survey, for phone interviews after the initial survey as well. Landowners were selected for phone interviews to further explain attitudes toward conservation easement programs as indicated by survey results, as well as attempt to accurately describe specific motivators and barriers to participation and how they affect landowners' lives in specific instances. Phone interviews were selected instead of other methods, such as focus groups, to work within a limited time frame and to limit the inconvenience of landowners, as phone interviews require no travel time and no scheduling concerns. The information obtained in the phone interviews was not analyzed as a part of this study, but the results are meant to supplement findings from the survey with more detailed input from landowners.

Data Analyses

Data obtained from survey responses were analyzed using either descriptive statistics or explanatory statistics. Descriptive statistics was used in instances where there were specific predetermined research questions posed by conservation organization personnel, such as what specific technical services most landowners would be interested in as part of an easement. Means and standard deviations of responses were determined using Microsoft Excel in order to be shared with easement holder organizations providing a general overview of landowner attitudes and perceptions.

Exploratory statistics were used to find relationships between different variables in the data, such as what demographic characteristics were more likely to correspond with a positive perception of CEs. The first exploratory method used was finding the Cronbach coefficient alpha value for multiple items used to demonstrate the important one construct of interest. Cronbach's alpha is a value between 0 and 1 that describes the reliability of data, or the strength of consistency between items (Goforth, 2015). This value was used to assess the validity of specific survey items in describing either shared or self-interest motivators before these two constructs were further statistically analyzed.

The other exploratory statistical approach was a bivariate correlational analysis, used to find Pearson Correlation Coefficients between -1 and 1 describing relationships between different survey questions (Yeager, 2023). Specific correlations were tested in order to either confirm or contradict existing literature in other regions or to address specific questions of local watershed protection personnel. For example, there was particular interest from the Illinois River Watershed Partnership about differences in perceptions and easement structure preferences

among agricultural and floodplain landowners compared to the larger population. These methods were used to identify larger patterns in the data that could then be applied to larger populations in order to aid conservation efforts of local organizations. Both the Cronbach alpha values and strength of bivariate correlational analysis were performed using SAS statistical analysis software (SAS Enterprise Miner 13.1. SAS Institute Inc., Cary, NC.).

All data analysis, descriptive and exploratory, was done to better guide the efforts of conservation organizations in expanding conservation easement programs. More information was needed in the Beaver Lake and Illinois River watersheds about current landowner attitudes and preferences to influence local easement organizations' easement structuring, as well as communication efforts.

Results

Survey respondents answered a variety of questions that gathered information about their demographic characteristics, general awareness and perceptions of CEs, perceived motivators/barriers, and preferences among a variety of specific easement conditions. Responses related to general perceptions of CEs were compared to demographic information to investigate the influence of demographics on likeliness to adopt a CE. Responses to these questions were also compared to agricultural and floodplain landowners to determine if there are different motivations for different subsets of landowners depending on land type.

Demographics, Awareness, & Attitudes

The survey resulted in 77 usable responses from landowners in the counties of interest during the two weeks of data collection. The majority of respondents were landowners in

Northwest Arkansas, with 64% (n = 49) owning/managing land in Washington County, AR and 23% (n = 18) in Benton County, AR.

In general, respondents were more highly educated and had greater incomes than the average Arkansan. Over 83% of respondents completed at least a four-year college degree and report a median income of \$70,000 to \$79,000, compared to 24.3% and an average income of \$29,210 for the state of Arkansas (U.S. Census Bureau, 2021). There was at least one response from all counties of interest, though average acreage of owned land varied greatly. Table 1 summarizes the average acreage owned by respondents (*M*) by county. In addition to varied acreage of owned land, respondents also owned/managed their land for a variety of reasons (Table 2). Forty seven percent (47%) of respondents reported having a mortgage or lien on their property, which NWALT personnel suggests is a deterrent to many land trusts seeking to place a CE on land (P. Nelson, personal communication, July 19, 2022).

Table 1

Average (M) and Maximum Acreage by County

County	<i>n</i>	<i>M</i>	Maximum
Benton	20	13.87	188
Washington	52	52.62	900
Madison	12	100.00	720
Carroll	6	34.17	200
Crawford	5	8.00	40
Adair	6	86.83	300
Delaware	4	175.00	700
Cherokee	7	89.43	275
Sequoyah	4	1.63	6.5

Table 2

Reason for Owning/Managing Land with Mean Importance (M)

Reason	<i>n</i>	Very unimportant	Somewhat unimportant	Neutral/No opinion	Somewhat important	Very important	<i>M</i>
Scenic value	76	3	1	7	26	63	4.46
Wildlife habitat	77	4	4	4	25	64	4.40
Primary residence	74	9	4	3	8	76	4.36
Land investment	77	11	6	12	25	47	3.91
Family estate (inherited land or land to pass onto heirs)	75	21	4	16	31	28	3.40
Agricultural production	75	41	7	15	20	17	2.65
Hunting	74	55	10	15	11	9	2.09
Timber production	75	69	5	11	11	4	1.75

Note. Values expressed in percent of responses.

In general, awareness of existing easement programs was low, with 45% of respondents stating they were unaware of any easement organizations in their area. However, 70% of respondents indicated they understand what a CE is, and 51% stated they felt a CE could benefit their land.

Perceived Motivators for Participating in Easement Programs

Survey respondents were asked to rate perceived incentives to participating in an CE program on a 1-5 scale (1 = not at all important; 5 = extremely important). The incentivizing factors selected for inclusion in the survey were based on the existing literature (Farmer et al., 2015; Effa, 2009) as well as conversations with CE experts. As seen in Table 3, “shared interest” motivators, which related to protecting the natural value of the land, was ranked higher in overall importance than “self-interest” motivators, such as reduction in taxes or payments. In this study,

survey responses of “prevention of development/subdivision of land”, “protection of family legacy property”, “reaching conservation/stewardship goals” and “protect scenic value” were categorized as shared interest motivators, with a Cronbach coefficient alpha value of 0.67. In general, a 0.70 Cronbach coefficient alpha value is acceptable for the reliability of a certain construct, but a minimum value of 0.60 is also often used (Goforth, 2015). The remaining survey responses, “reduction in state/federal income or estate tax”, “technical assistance/advice”, “lump sum payment up front, based on acreage & easement length”, and “working with a non-governmental organization that has met accreditation standards”, were categorized as self-interest motivators, with a Cronbach coefficient alpha value of .77. Using these categories, shared-interest motivators were ranked at an average of 3.7 on the 1-5 scale, and self-interest motivators were ranked at an average of 3.0.

Table 3

Perceived Level of Incentives for Adopting CEs

Incentive	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Protect scenic value	1	5	20	24	50
Prevention of land development	9	9	14	24	44
Reaching conservation goals	5	3	31	33	28
Protection of family legacy property	25	9	20	21	25
Working with an accredited NGO	4	15	25	34	22
Reduction in state/federal income/estate tax	14	25	31	12	18
Technical assistance/advice	20	8	32	27	13
Lump sum payment up front	27	21	24	16	12

Note. Values expressed in percent of responses; $n = 77$

As seen in Table 3, half of the respondents (50%) also noted protecting scenic value as an extremely important incentive for adopting a CE on their property. Receiving a lump sum payment up front was the lowest rated incentivizing factor, where only 12% of respondents listed this as an extremely important factor.

When comparing perceived incentives to demographic information, including whether the respondent owns or manages agricultural land, other relationships appear. As shown in Table 4, technical assistance/advice or “capacity building” was ranked higher than either financial motivator option, with a mean rating value of 3.06 compared to 2.95 for tax deductions and 2.63 for a lump sum payment. There was a moderate positive correlation (as shown by the Pearson Correlation Coefficient (r)) between agricultural land ownership and importance ranking of technical assistance ($r = 0.23, p \leq .05$), and a weak positive correlation with reduction in income/estate tax ($r = 0.21$). Owning agricultural land was unrelated with the rating of the other incentivizing factors listed.

Table 4

Perceived Incentive Importance of Agricultural Landowners (LOs), with Mean and Standard Deviation (SD)

Incentive	Mean	SD	Agricultural LOs (r)
Protect scenic value	4.16	1.01	0.08
Prevention of land development	3.84	1.33	- 0.08
Reaching conservation goals	3.75	1.06	0.02
Working with an accredited non-governmental organization	3.57	1.11	- 0.02
Protection of family legacy property	3.12	1.52	- 0.01
Technical assistance/advice	3.06	1.29	0.23*
Reduction in state/federal income/estate tax	2.95	1.30	0.21

Lump sum payment up front	2.63	1.35	0.09
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* $p \leq 0.05$; ** $p \leq 0.01$; $n = 77$

In order to assess whether increasing awareness of CEs was related to a perception of greater CE benefit, survey question #10 evaluating the number of CE programs the respondent was familiar with was correlated with survey question #13 evaluating whether the respondent felt a CE could benefit their land, and with question #14 addressing averaged ranking of specific perceived benefits/encouraging factors. Results from the correlation analyses showed that as awareness of CE programs increased, the overall positive perception of benefit also increased ($r = 0.27, p \leq 0.05$), but the positive perception of specific incentivizing factors did not increase significantly.

Perceived Barriers to Participating in Easement Programs

Survey respondents were asked to rank how important discouraging factors to participating in an easement program were on a scale from 1-5 (1 = not at all important; 5 = extremely important; Table 5).

Table 5

Perceived Level of Disincentives for Adopting CEs

Disincentive	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Loss of privacy	12	15	13	21	39
Financial obligation	8	9	25	28	30
Loss of property rights	21	21	11	18	29
Lowered property value	28	14	17	14	27
Inadequate compensation	14	18	23	20	25
Limiting heirs' decision making	17	20	21	20	22
Working with a governmental agency	28	15	37	4	16

Complexity of easement processing	13	15	33	25	14
Time obligation	15	16	37	19	13
Changes in agricultural practices	44	13	17	13	13

Note. Values expressed in percent of responses; $n = 77$

Results showed that “loss of privacy” as a disincentive to participating in a CE program was ranked as either very important or extremely important by 60% of respondents, and “financial obligation” was ranked as either very important or extremely important by 58% of respondents (Table 5). The disincentive with the least amount of importance to respondents was “changes in agricultural practices”, which was ranked as not at all important by nearly half of respondents (44%; Table 5). These results align with agricultural landownership having been reported as one of the areas of lowest importance for surveyed landowners owning their land ($M = 2.65$, $SD = 1.59$). Similar to the perceived incentives, there was a difference in importance of various discouraging factors between the entire group of respondents and those who own/manage agricultural land. As seen in Table 6, agricultural landowners’ responses had a moderate positive correlation to both disincentive factors of changes in agricultural practices ($r = 0.34$, $p \leq .01$) and time obligation ($r = 0.26$, $p \leq 0.05$).

Table 6

Perceived Disincentive Importance of Agricultural Landowners (LOs) and Correlated with Awareness with Standard Deviations (SD)

Disincentive	Mean	SD	Agricultural LOs (r)	Awareness (r)
Financial obligation	3.63	1.23	.13	-.23*
Loss of privacy	3.60	1.43	.14	-.28*

Inadequate compensation	3.25	1.37	.19	-.30**
Loss of property rights	3.13	1.55	.08	-.06
Complexity of easement processing	3.13	1.23	.08	-.16
Limiting heirs' decision making	3.11	1.41	.05	-.02
Time obligation	3.00	1.22	.26*	-.30**
Lowered property value	2.97	1.57	-.11	-.33**
Working with a governmental agency	2.65	1.37	.12	-.37**
Changes in agricultural practices	2.39	1.48	.34**	-.17

* $p \leq 0.05$; ** $p \leq 0.01$; $n = 77$

In order to assess whether increasing awareness of CEs was related to a perception of lower risk of CEs, survey question #10 evaluating the number of CE programs the respondent was familiar with was correlated with survey question #15 addressing ranking of specific perceived risks/discouraging factors. Results showed a relationship between increased awareness and reduced perceived risk with several significant negative correlations between awareness and specific discouraging factors such as “financial obligation” ($r = -.23, p \leq 0.05$), “loss of privacy” ($r = -.28, p \leq 0.05$), “inadequate compensation” ($r = -.30, p \leq 0.01$), “Time obligation” ($r = -.30, p \leq 0.01$), “Lowered property value” ($r = -.33, p \leq 0.01$), and “Working with a governmental agency” ($r = -.37, p \leq 0.01$).

Preferences in Easement Structuring

The structure of a CE refers to the specificities of the legal document and the scope (i.e., spatial and temporal) of the CE, as well as what services can be provided by an easement organization in addition to granting a CE on a landowner's property. In addition to provided

services, easement structure can differ in what proportion of the land is under a CE and for what length of the time the land is under a CE. To evaluate preferences of landowners for a CE with differing structures, a survey question asked respondents what terms they would consider enrolling in a CE under. The term options listed were based on preliminary conversations with CE experts and web research of existing CE programs in the region and included combinations of all or part of the land owned/managed and an easement of perpetual length, a 30-year easement, and an easement for less than 30 years. Table 7 shows the results from this question regarding easement terms among all respondents, as well as correlations between both size of land owned/managed and time the land has been in the landowner's family with preference of different easement terms.

Table 7

Preference of Differing Easement Terms with Standard Deviation (SD)

Easment option	<i>n</i>	<i>Mean</i>	<i>SD</i>	Acreage (<i>r</i>)	Time in Family (<i>r</i>)
Part of land; permanent easement	72	3.06	1.36	0.17	0.06
Part of land; < 30-year easement	70	3.01	1.67	0.22	- 0.03
Part of land; 30-year easement	70	2.89	1.33	0.24*	0.07
All of land; < 30-year easement	70	2.50	1.20	- 0.12	- 0.24*
All of land; 30-year easement	71	2.42	1.26	- 0.05	- 0.17
All of land; permanent easement	74	2.28	1.26	- 0.11	- 0.26*

* $p \leq .05$ ** $p < .01$

As seen in Table 7, there were significant relationships between easement term preferences and the acreage of land owned, as well as the amount of time the landowner's land had remained in their family (if owned). As the size of the owned/managed land increased, the likeliness to consider placing an easement on part of the land (instead of all), especially for shorter amounts of time, also increased (list the correlation). A similar relationship appeared in

preferences of landowners who had had their land in their family for longer amounts of time, where as length of family ownership increased, the likeliness of a landowner to adopt a CE on all of their land decreased (list the correlation).

Table 8 illustrates the preferred technical solutions of respondents. Technical solutions are considered a type of capacity building and are incentives that may be included in a conservation easement that do not consist of payment and are instead services the easement-holding organization may provide to meet a variety of landowner needs and conservation goals. Respondents were asked to rank the following technical services on a 1-5 scale (1 = not at all interested; 5 = very interested).

Table 8

Mean Preference of CE Benefits with Standard Deviations (SD)

Technical Service	Mean	SD
Invasive species management	4.56	0.61
Tree planting funding/species selection	4.37	0.61
Streambank restoration	4.16	1.33
Riparian buffer installment	3.98	1.33
Soil sampling/treatment recommendations	3.93	1.31
Prescribed burns	3.66	1.42
Fencing for livestock	2.49	1.58

n = 77

As seen in Table 8, the technical service ranked most highly by respondents was invasive species removal ($M = 4.56$, $SD = 0.61$), followed by tree planting ($M = 4.37$, $SD = 0.61$) and streambank restoration ($M = 4.16$, $SD = 1.33$). Soil sampling ($M = 3.93$, $SD = 1.31$) and fencing for livestock ($M = 2.49$, $SD = 1.58$) were the technical services for which respondents indicated

the least interest, which is consistent with the relatively low importance of owning land for agricultural production among respondents (Table 2).

Preferences of Floodplain and Agricultural Landowners

Survey respondents were first asked if they owned/managed any agricultural land, and the respondents who answered yes were then directed to answer a question relating to the different easement conditions in which they would consider participating. The choices of response were based on a 1-5 scale (1 = not at all likely; 5 = extremely likely) to consider participating in the given easement program terms. Table 9 presents the preferred easement conditions (proportion of land and easement term length) among agricultural landowner respondents ($n = 20$).

Table 9

Preference of Easement Terms of Agricultural Landowners with Standard Deviations (SD)

Easement option	<i>Mean</i>	<i>SD</i>
All of land; 30-year easement	3.50	.89
All of land; < 30-year easement	3.00	.94
Part of land; 30-year easement	2.85	1.14
Part of land; permanent easement	2.60	1.88
Part of land; < 30-year easement	2.53	1.22
All of land; permanent easement	1.00	0.00

$n = 20$

As seen in Table 9, the easement terms ranked most likely for producers to consider was “all of my land; 30-year easement” ($M = 3.50$, $SD = 0.89$). Generally, this sample of agricultural landowners favored shorter easement terms that cover all of their land. The least preferred term length was “all of my land; permanent easement”. Every respondent ($n = 20$) assigned this

easement condition a score of 1, meaning this sample of agricultural landowners would be extremely unlikely to adopt a permanent easement on their land.

If landowners answered “no” or “unsure” to owning agricultural land, the survey continued to ask if they owned floodplain land. Answering “yes” to owning floodplain land redirected the respondents to the same specific easement option questions. Answering “no” concluded the survey. Table 10 presents results from a survey question asking floodplain landowners ($n = 30$) which easement terms they prefer, using the same answer choices as the previous agricultural landowner question. The discrepancy in the total landowners surveyed ($n = 77$), and the reported agricultural or floodplain landowners can be explained by survey respondents responding either “no” or “unsure” to either question. Choices were based on a 1-5 scale (1 = not at all likely; 5 = extremely likely) to consider participating in a CE with the given program terms.

Table 10

Preference of Easement Terms of Floodplain Landowners with Standard Deviations (SD)

Easement option	Mean	SD
All of land; < 30-year easement	3.45	1.20
All of land; permanent easement	3.27	1.26
All of land; 30-year easement	3.27	1.26
Part of land; < 30-year easement	3.07	1.67
Part of land; 30-year easement	2.87	1.33
Part of land; permanent easement	2.65	1.36

$n = 30$

Preferences of CE program options by floodplain landowners can be seen in Table 9. In contrast to preferences of agricultural landowners, floodplain landowners rated easements involving all of their land (of any term length) as greater than easements only covering part of

their land. In addition, floodplain landowners generally had a more positive opinion on adopting an easement on their property, with the average means of all condition options being greater than the agricultural landowners.

After questions addressing easement terms of potential CEs on agricultural or floodplain land, eligible respondents were asked to select a dollar amount between \$0 and \$200 as a minimum payment amount (per acre per year) that would cause them to consider placing an easement on the agricultural/floodplain land they own/manage. Agricultural landowners reported an average of \$165/acre/year, with 56% of respondents ($n = 10$) selecting the maximum amount of \$200, and floodplain landowners reported an average of \$114/acre/year, with 32% of respondents ($n = 8$) selecting the maximum amount of \$200.

The over-arching goal of this study was to use survey results to better guide the conservation efforts of easement-holder organizations in the Beaver Lake and Illinois River watersheds. Recommendations given are based on the survey results presented, existing guiding literature, and specific landowner feedback provided by interviews conducted after the survey.

Summary and Recommendations

Survey responses gathered provided insight into what factors are most important to landowners when considering placing a CE on their property. These insights are provided here to better guide the outreach efforts of conservation organizations regarding CEs, and to increase positive landowner perceptions of CEs in the Beaver Lake and Illinois River watersheds. Specifically, this study aimed to identify general awareness and attitudes of landowners toward CEs/CE organizations, perceptions of various motivators and barriers to participating in a CE, whether shared or self-interest motivators are more likely to encourage a landowner to consider a

CE, relative importance of financial motivators vs. “capacity building”, preference of differing easement terms/structuring, and the influence of demographic characteristics (including agricultural and floodplain land ownership) on attitudes, perceptions, and preferences.

It should be kept in mind, however, that results from this study are unlikely to be fully representative of the population of interest to easement organizations. Specifically, this study had a relatively low response rate from agricultural and/or floodplain owners, which may be of interest to some easement organizations. Additionally, there were several responses from landowners with small acreage, especially in Washington County, AR, with several responses recorded from landowners with less than one acre. While most easement organizations don’t require a minimum acreage to enroll land in a CE, larger acreage is more likely to be prioritized due to more significant conservation value.

Although attitudes towards conservation easements were generally positive, awareness of specific CE organizations was low, and there were misconceptions evident in the disincentivizing factors ranked most important by respondents. Positive attitudes but low awareness of respondents may indicate that landowners in the region would generally favor placing a CE on their land but are uninformed about their options regarding CEs and therefore have a greater perception of certain risks. This is supported by the strong correlation between increased awareness and decreased importance of specific discouraging/risk factors, suggesting that the first step to fostering more interest in CEs is to provide more easily accessible information regarding landowners’ options. It is recommended that there be more attempts at providing clear and comprehensive information regarding local CE programs, especially online, where much of the online information is currently incomplete and/or confusing, requiring phone calls to be made to validate or expand upon easement organization websites.

When asked to rank various disincentives to adopting a CE program, respondents ranked “loss of privacy” and “financial obligation” as the two most disincentivizing factors. The concern about loss of privacy may be a misconception, as many CE programs do not require public access to be granted to the land. It is recommended that this distinction, as well as expectations of monitoring activities, be made clear in messaging to landowners to ease privacy-related concerns. In addition, concern about having a financial obligation to enroll land in an easement may indicate that landowners are unfamiliar with various cost-sharing and payment benefits to CE programs, especially those that can help the landowner meet their own personal goals. In order to address low awareness and misconceptions regarding risks of CEs, outreach efforts regarding CEs should be expanded, especially those that include clear and concise descriptions of what a CE is, how CEs work, and what landowner needs can be addressed using a CE. Following awareness-level communications efforts, messaging specific to privacy and financial benefits should be produced to address landowners’ concerns.

In contrast, agricultural respondents ranked “changes in agricultural practices” and “time obligation” as the most disincentivizing factors to participating in a CE program. The disincentives ranked most important to producers were ranked relatively low in importance by the entire respondent group, suggesting agricultural landowners have different priorities when deciding to enroll their land in an easement compared to the general population. If regionally local CE organizations are specifically targeting agricultural landowners, messaging should be focused on how a CE would impact their agricultural practices, as well as how much additional time the farmer/rancher can expect to have to contribute to the process.

Agricultural respondents indicated technical assistance/advice and tax reduction to be the most incentivizing factors for adopting CEs on their property. Therefore, if agricultural land is a

specific target for easement organizations, messaging focusing on tax benefits and/or technical assistance may be most helpful in persuading these landowners.

The other main demographic factors identified to have an influence on likeliness to adopt a CE were the number of acres owned/managed by a landowner, and the amount of time the land had been in the landowner's family. As the size of land increased, landowners were more likely to consider an easement on part of their land, instead of all of their land, especially for shorter amounts of time. Similarly, as the amount of time the land had been in the landowner's family increased, the less likely landowners were to consider an easement on all of their land, especially for longer amounts of time. These results suggest that acreage and legacy property are two factors easement organizations may want to consider when contacting landowners regarding CEs, and that landowners with certain demographics may be more likely to consider enrolling in an easement with less strict requirements, such as those that allow landowners to enroll just part of their land for shorter amounts of time. However, based on preliminary conversations with experts in the CE field, easement holder organizations may often avoid easements of 30 years or less in favor of perpetual easements.

Survey results showed that a majority of respondents ranked shared-interest motivators, such as protecting scenic value and preventing the development of land, as more important than self-interest motivators, such as tax reductions or payments, when considering whether or not to participate in a CE program. These results may be partially due to the relatively large median income range of respondents (\$70,000 to \$79,000), however, Tanguay (2021) and Kemink et al. (2020) also recommend focusing on the shared-interest motivators more intently than financial gain to encourage landowner motivations more toward stewardship ideals. It is recommended that CE organizations focus on the shared-interest motivators in communications regarding CEs,

specifically emphasizing that CEs can address a variety of landowner desires to protect their land for years to come, rather than solely advertising financial benefits that can be gained through enrolling in a CE.

In terms of self-interest-specific motivators, survey results supported the importance of capacity building/technical assistance over financial motivators, such as tax deductions or payments. Conservation organizations should see these results as an opportunity to explore and expand current technical solutions that may be offered as complimentary practices to placing a CE on land. Of the specific technical solutions included in the survey, easement organizations may have the most impact on local landowners with communications regarding invasive species management, tree planting services, and streambank restoration activities.

Results indicate a preference of landowners for CEs applied to part of their land, opposed to all of their land, regardless of easement length of time. This may indicate to easement organizations that outreach efforts should emphasize that enrolling all the acreage owned/managed is not required to participate in a CE, especially because the majority of easement organizations interviewed as a part of this study had no minimum acreage to consider a CE. Based on the survey results, both agricultural and floodplain landowners favored shorter easement term length options (i.e., 30 years or less than 30 years). This result is supported by respondents ranking the disincentivizing factor of “limiting heirs’ decision-making ability” as moderately high, which suggested that landowners would more readily consider easement options where the term length would not exceed their lifetime. Based on the responses, it is recommended that easement organizations focus messaging on shorter-term easement options to reach the largest number of landowners.

The hope is that this study will serve as a guide for future outreach efforts of conservation organizations in the Beaver Lake and Illinois River watersheds. Information regarding importance of various perceived motivators/benefits and barriers/risks, preference of specific easement structure conditions, and influence of demographic factors on these perceptions can all serve as valuable resources in future communications and outreach efforts regarding CEs to increase the acceptance and popularity of CEs in the region.

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Figures

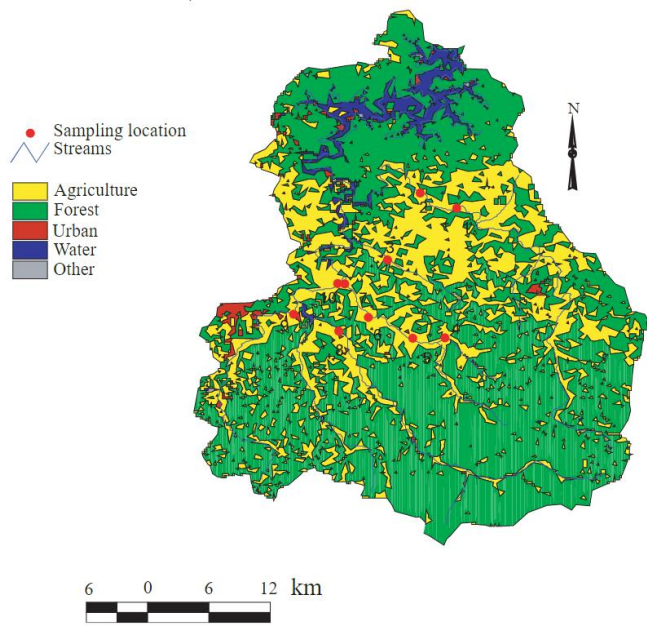


Figure 1: Land use in the Beaver Lake Watershed, categorized as agricultural (primarily pastureland and poultry production), forest, urban, water, and other (Haggard et al., 2003)

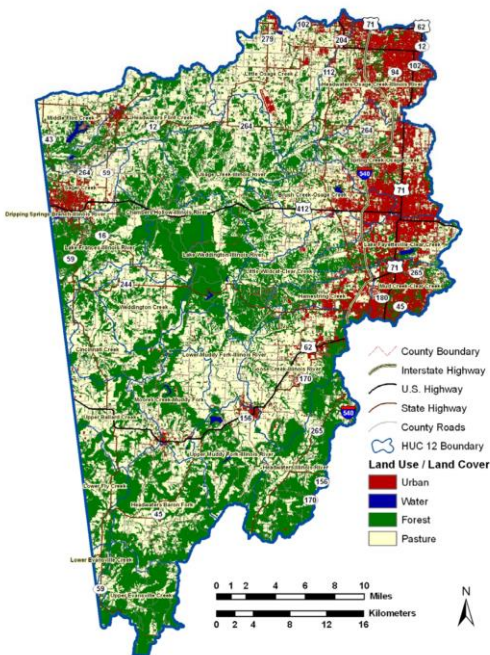


Figure 2: Land use in the Illinois River watershed (Arkansas portion) categorized as urban, water, forest, and pasture (Haggard et al., 2010)

Appendix

Institutional Review Board (IRB) exemption letter:



To: Jefferson D Miller
From: Douglas J Adams, Chair
IRB Expedited Review
Date: 10/07/2022
Action: **Exemption Granted**
Action Date: 10/07/2022
Protocol #: 2207409710
Study Title: Landowner Perceptions of Conservation Easement Programs

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu.

cc: Caitlin Cooper, Investigator
Shane M White, Investigator
Lauren Gwaltney, Investigator

Landowner survey:

~25 Questions (5-10 minutes total)

[Informed consent acknowledgement]

Demographic questions

- What is your age? * _____
- What is your gender? *
 - Male
 - Female
 - Non-binary / third gender
 - Prefer not to say
- What is your highest level of education completed?
 - Less than high school
 - High school graduate
 - Some college
 - 2 year degree
 - 4 year degree
 - Doctorate
 - Professional degree
- What is your primary occupation (previous, if retired)? *
 - Agriculture, forestry, or fishing
 - Managerial or professional
 - Construction
 - Finance, insurance, or real estate services
 - Manufacturing
 - Public administration, education, or government
 - Transportation, communications, or utilities
 - Retail trade
 - Wholesale trade
 - Other (please specify) _____
- What is your annual gross income?
 - Less than \$10,000
 - \$10,000 - \$19,000
 - \$20,000 - \$29,000
 - \$30,000 - \$39,000
 - \$40,000 - \$49,000
 - \$50,000 – \$59,000
 - \$60,000 – \$69,000
 - \$70,000 – \$79,000
 - \$80,000 – \$89,000
 - \$90,000 – \$99,000
 - \$100,000 – \$150,000
 - More than \$150,000

- Prefer not to say
- Do you own/manage land in any of the following counties (select all that apply)?
[Skip to end of survey if none selected]
 - Benton County, AR
 - Washington County, AR
 - Madison County, AR
 - Carroll County, AR
 - Crawford County, AR
 - Adair County, OK
 - Delaware County, OK
 - Cherokee County, OK
 - Sequoyah County, OK
- Does the property you own/manage have a mortgage or lien?
 - Yes
 - No
 - Unsure
- How many acres of land do you own/manage in each county?
 - Benton County _____
 - Washington County _____
 - Madison County _____
 - Carroll County _____
 - Crawford County _____
 - Adair County _____
 - Delaware County _____
 - Cherokee County _____
 - Sequoyah County _____
- How many years have you owned/managed your land in each county?
 - Benton County _____
 - Washington County _____
 - Madison County _____
 - Carroll County _____
 - Crawford County _____
 - Adair County _____
 - Delaware County _____
 - Cherokee County _____
 - Sequoyah County _____
- How many years has your land been in your family in each county (if owned)?
 - Benton County _____
 - Washington County _____
 - Madison County _____
 - Carroll County _____
 - Crawford County _____
 - Adair County _____
 - Delaware County _____
 - Cherokee County _____
 - Sequoyah County _____

- Please rate the following reasons for owning your land using the following 1-5 scale:

- 1- Not at all important
- 2- Somewhat unimportant
- 3- Neutral/No opinion
- 4- Somewhat important
- 5- Very important

- a. Land investment
- b. Wildlife habitat
- c. Agricultural production
- d. Timber production
- e. Family estate (inherited land or land to pass onto heirs)
- f. Primary residence
- g. Hunting
- h. Scenic value
- i. Other (please specify) _____

[Objective 1: characterize landowner perceptions]

Please refer to the following definition when answering the remaining questions:

Conservation: the act of protecting land's natural resources for current and future generations

- How strongly do you agree with the following statement?
I understand what a conservation easement is.*
 - Strongly disagree
 - Disagree
 - Neither agree nor disagree
 - Somewhat agree
 - Strongly agree
- Complete the following statement: I feel that conserving my land is _____.*
 - Not at all important
 - Slightly important
 - Moderately important
 - Very important
 - Extremely important

For the remainder of the survey, please refer to the provided definition of a conservation easement.

Conservation easement: A voluntary legal agreement between a landowner and an easement organization, such as a non-governmental land trust or watershed protection/conservation organization, or a government agency, that limits uses of the land to conserve its ecological, agricultural, and/or historical value.

- How strongly do you agree with the following statement?

I feel that a conservation easement could benefit my land.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

- Please rate which factors would **encourage** you to enroll your land in a conservation easement using the following 1-5 scale:

- 1- Not at all important
- 2- Slightly important
- 3- Moderately important
- 4- Very important
- 5- Extremely important

- a. Reduction in state/federal income or estate tax
- b. Prevention of development/subdivision of land
- c. Protection of family legacy property
- d. Reaching conservation/stewardship goals
- e. Protect scenic value
- f. Technical assistance/advice
- g. Lump sum payment up front, based on acreage & easement length
- h. Working with a non-governmental organization that has met accreditation standards
- i. Other (please specify) _____

- Please rate which factors would **discourage** you to enroll your land in a conservation easement using the following 1-5 scale:

- 1- Not at all important
- 2- Slightly important
- 3- Moderately important
- 4- Very important
- 5- Extremely important

- a. Lowered property value
- b. Loss of property rights (such as subdivision, development, etc.)
- c. Limiting heirs' decision-making ability
- d. Change in agricultural practices
- e. Complexity of easement drafting and processing
- f. Time obligation
- g. Loss of privacy
- h. Financial obligation
- i. Inadequate compensation
- j. Working with a governmental agency
- k. Other (please specify) _____

[Objective 2: methods of communication/education]

- Are you aware of others in your area who have conservation easements on their property?*
- Yes
- No
- Unsure
- How many conservation easement organizations in your area are you aware of?
- None
- 1-2
- 3-4
- 5+
- How likely are you to have a conservation with another landowner in your area about conservation easements?*
- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely
- Rate the credibility of the following sources for conservation easement information using the following 1-5 scale:*
- 1 – Not at all credible
- 2 – Somewhat not credible
- 3 – Somewhat credible
- 4 – Extremely credible
- 5 – No opinion
- a. Natural Resources Conservation Service (NRCS)
- b. Local land trusts
- c. Peers (friends, family, neighbors)
- d. County Cooperative Extension Office
- e. Local watershed protection/conservation organizations
- f. Agricultural organizations/commodity groups
- g. Other (please specify) _____
- Rate your preferred methods of receiving conservation easement information/updates using the following 1-5 scale:*
- 1 – Never use
- 2 – Use occasionally
- 3 – No opinion
- 4 – Use regularly
- 5 – Use every time

- a. Email
- b. Websites
- c. Social media
- d. Printed items via mail
- e. Peer-to-peer conversations
- f. In-person seminar/field days
- g. Webinars
- h. Individual conversations with experts
- i. Other (please specify) _____

[Objective 3: solutions]

- How interested would you be in the following services as part of a conservation easement program (assuming the easement organization may cover up to 70-100% of the associated costs)?

- 1- Not at all interested
- 2- Somewhat uninterested
- 3- Neutral
- 4- Somewhat interested
- 5- Very interested

- a. Fencing for livestock
- b. Soil sampling/treatment recommendations
- c. Access to city/rural water
- d. Invasive species management
- e. Riparian buffer installment
- f. Streambank restoration
- g. Prescribed burns
- h. Other (please specify) _____

- How likely would you be to enroll in a conservation easement under the following terms?

- 1- Extremely unlikely
- 2- Somewhat unlikely
- 3- Neither likely nor unlikely
- 4- Somewhat likely
- 5- Extremely likely

- a. **All** of my land; permanent easement
- b. **Part** of my land; permanent easement
- c. **All** of my land; 30-year easement
- d. **Part** of my land; 30-year easement
- e. **All** of my land; easement under 30 years
- f. **Part** of my land; easement under 30 years

- Do you own/manage any land in a floodplain?
 - Yes
 - No
 - Unsure
- [If yes above] What minimum payment amount (per acre per year) would cause you to consider placing an easement on the floodplain land you own/manage? _____ [sliding scale from \$0-200]
- For what term length would you consider placing an easement for on the floodplain land you own/manage? (select all that apply)
 - Less than 30 years
 - 30 years
 - Perpetual
- Do you own/manage any agricultural land?
 - Yes
 - No
 - Unsure
- [If yes above] What minimum payment amount (per acre per year) would cause you to consider placing an easement on the agricultural land you own/manage? _____ [sliding scale from \$0-200]
- For what term length would you consider placing an easement for on the agricultural land you own/manage? (select all that apply)
 - Less than 30 years
 - 30 years
 - Perpetual

[Incentive Contact]

- Would you like to be entered into a drawing for one of ten \$50 Amazon gift cards? (If you select yes, you will be redirected to a separate survey to collect your contact information- your name and other personal information will not be linked to your survey responses)
 - Yes
 - No
- [If yes above] What is your first name? _____
- What is your last name? _____
- What is your email? (gift cards will be mailed; contact information is to notify winners) _____
- What is your phone number? _____
- What is your address? _____
- Do you consent to being contacted for a 15 minute phone interview?
 - Yes
 - No

[End of Survey]

We thank you for your time spent taking this survey.

Your response has been recorded.

**- question not analyzed as a part of this study; see Cooper (2023)*