**Response to Reviewers**

Dear reviewers,

We appreciate your comments and suggestions on our manuscript. We have addressed them to the best we can. Any added words and texts in the manuscript are highlighted in green font. Deleted sentences and paragraphs are reported in this file under each relevant comment provided by the reviewer. Response to reviewer comments, including rebuttals, are addressed in this file in the tabulated format. We appreciate your help in improving our manuscript.

**Reviewer 1:**

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| Reviewer’s comment | Respond | Action taken | Page and line numbers where the change has occurred |
| The paper “Intentions of Landowners Towards Active Management for White-tailed Deer Hunting in the Forest-Grassland Transitional Ecoregion of the South-Central USA” is interesting for journal readers but the current version of manuscript needs revisions before further consideration. | Thank you. We appreciate your observation. |  |  |
| The aim of the paper should be assessed more uniformly through the paper. Moreover, the authors should start with a clear question(s) that will be answered. The objectives and/or research questions section would help to summarize and focus the overall aim of the study and improve the conclusions section once the main ideas are clearly systematized. | Thank you for your suggestion. In response to your suggestion, we rewrote our objective and moved objective and research question to the second paragraph.  We also revised the conclusion section to make connection between objective and conclusion. It is now more precise. | Thus, this paper addresses the question about how landowners’ beliefs, attitude, norms, and intentions for the active management of forest and rangeland for deer habitat management are interrelated with each other.”  This research provided holistic and broader picture of landowner’s intentions towards actively managing their land for deer habitat management which can be crucial in designing Extension and outreach programs. Realization of increased revenue by maintaining healthy and resilient forest can drive active management in this region ([Starr et al., 2019](#_ENREF_40)). The findings of this research provide an assurance of positive peer pressure, moral support, feeling of self-sufficiency, and intentions towards active management. Our findings are consistent with the previous research indicating high support of prescribed fire but some degree of hesitancy when it comes to adoption ([Elmore et al., 2010](#_ENREF_14)). As previous research indicates, fire and related liability issues ([Elmore et al., 2010](#_ENREF_14); [Starr et al., 2019](#_ENREF_40)) and financial burden ([Starr et al., 2019](#_ENREF_40)) remain as obstacles for active management, which can be overcome through Extension and outreach programs ([Elmore et al., 2010](#_ENREF_14); [Starr et al., 2019](#_ENREF_40)). Outreach and Extension programs can help landowners realize increased revenue due to active management as well as reduce liabilities. The perceived risk and liabilities of fire decrease with the increase in knowledge and experience associated with prescribed burning ([Joshi et al., 2019a](#_ENREF_23)). | Manuscript Page #5, Line # 94-96.  Manuscript Page #18-19, Line # 401-415. |
| As far as the methodological approach is concerning, the section “Methods” should be further explained for a full comprehension of the analysis and for replication. | We appreciate your suggestion. The method section describes theoretical frameworks for two theories 1) theory of planned behavior and 2) theory of reasoned action. The theoretical section has cited several published papers from the founder of both theories. to guide the readers towards original articles. Due to space limitation, we are unable to go into the theories in detail. A pictorial model is also provided to explain theories in model in detail. Furthermore, manuscript is revised for clarity in method. | Structural equation models were fit following procedure suggested by Anderson and David (1988) after obtaining an acceptable range of internal consistency and factor loadings in each latent variable for all four models. | Manuscript Page #11, Line # 228-229. |
| Moreover, the literature should be enriched, in such a way that the contribution of technology for land use is identified (Aldieri et al., 2021; Bai et al., 2019).  References Aldieri, L., Brahmi, M., Chen, J., Vinci, C. P. (2021). Knowledge Spillovers and Technical Efficiency for Cleaner Production: An Economic Analysis from Agriculture Innovation. Journal of Cleaner Production, https://doi.org/10.1016/j.jclepro.2021.128830.  Bai Y., Ochuodho T. O. and Yang J. (2019). Impact of land use and climate change on water-related ecosystem services in Kentucky, USA. Ecological Indicators, 102, 51-64. | Thank you for the suggestion. Both papers that you recommend for citation are very interesting, and we enjoyed reading them.  The Aldieri et al (2021) paper is a very interesting paper to know about the agriculture production efficiency and spillover effect from technological innovation in the agriculture sector. Even though this paper has made an important contribution towards agricultural efficiency analysis and technological innovation, we could not figure out a direct connection with our work. Our manuscript deals with the wildlife and habitat management for deer and the perception of landowners, which is different than agricultural production and efficiency analysis. While we could not cite this paper based on our current understanding, the more detailed comment will be helpful for us to find an appropriate place to fit this paper in our manuscript. We will be happy to revisit and address your comment in the next round of revision.  Bai et al. (2019) focus on climate change, water retention, soil retention, nitrogen, and phosphorus export. These issues are important and noble fields of research, but out of the scope of our current manuscript in which the active management of wildlife, deer habitat management, and attached human emotions are investigated. We would like to acknowledge your recommendation even though we have respectfully decided not to cite Bai et al. (2019) in our manuscript. Regardless, if we failed to make a connection to this paper due to our misunderstanding of the context and content of the paper, more detailed comments will be helpful for us to find a place to fit this paper in our manuscript. We will be happy to revisit and address your comment in the next round of revision. |  |  |
| The results of the analysis should be further discussed and improved also in terms of policy implications. The contribution can be made evident only putting the accent on the gap in the literature. | Some of the policy recommendations we suggested in the manuscript are to increase awareness about the prescribed fire and help landowners realize the added benefit of active management of the ecosystem through outreach and extension programs. We further discussed that helping landowners to recognize the added benefit of active management and cost of adoption could enhance the adoption because of improved ecosystem services and increased financial benefits.  We further revised the “Management Implications and Conclusion” section to improve our policy recommendations and specify how this paper contributes towards filling the research gap in the literature. We rearranged some sentences in this section to improve the flow and clarity of the content. | This research provided holistic and broader picture of landowner’s intentions towards actively managing their land for deer habitat management which can be crucial in designing Extension and outreach programs. Realization of increased revenue by maintaining healthy and resilient forest can drive active management in this region ([Starr et al., 2019](#_ENREF_40)). The findings of this research provide an assurance of positive peer pressure, moral support, feeling of self-sufficiency, and intentions towards active management. Our findings are consistent with the previous research indicating high support of prescribed fire but some degree of hesitancy when it comes to adoption ([Elmore et al., 2010](#_ENREF_14)). As previous research indicates, fire and related liability issues ([Elmore et al., 2010](#_ENREF_14); [Starr et al., 2019](#_ENREF_40)) and financial burden ([Starr et al., 2019](#_ENREF_40)) remain as obstacles for active management, which can be overcome through Extension and outreach programs ([Elmore et al., 2010](#_ENREF_14); [Starr et al., 2019](#_ENREF_40)). Outreach and Extension programs can help landowners realize increased revenue due to active management as well as reduce liabilities. The perceived risk and liabilities of fire decrease with the increase in knowledge and experience associated with prescribed burning ([Joshi et al., 2019a](#_ENREF_23)).  Landowners show respect to those involved in active management of ecosystems. Landowners are further supportive of actively managing their land for deer hunting by maintaining a good deer habitat and have positive social pressure from friends and family. Landowners, however, are not satisfied with the management outcomes. The positive sentiment of landowners towards active management but below expected outcome can be turned into an opportunity to motivate landowners to actively manage their land for deer hunting and increase revenue as well as revitalize deer hunting activities.  The management cost associated with the active management can be in part be offset through hunting leases; improved deer habitat through active management could motivates deer hunters to pay more money per acres as lease fee. Based on our research we suggest extension specialists and policy makers focus on educating landowners to make them aware about the cost and benefit associated with the active management. This could enhance confidence of landowners in adopting active management tools and realize financial benefits. The realization of reduced risk and added financial benefits could motivate landowners to adopt management tools in their forest and rangeland.  Stakeholders from government, non-profit organizations, and industry believe that an increase in investment and financial assistance programs could enhance active management of ecosystem in this region ([Starr et al., 2019](#_ENREF_40)). These types of programs could drive the active management and help landowners to increase their revenue in short run. Whereas, in the long run, it could help landowners to understand importance of active management using prescribed fire to maintain quality wildlife habitat and reduce the encroachment of invasive species in this region ([Joshi et al., 2019b](#_ENREF_24)). | Manuscript Page #18-19, Line # 401 – 437. |
| The quality of communication should be improved. Some sentences are not clear, and some parts are confusing. | Thank you for your observation. The revised manuscript and grammar were further reviewed and edited for clarity. | Edited for clarity. | Throughout the manuscript. |

**Reviewer #2**

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| Reviewer’s comment | Respond | Action taken | Page and line numbers where the change has occurred |
| The paper addresses a topic of practical importance, motivating landowners toward active management. At present, the exposition is too text-booky with regard to the statistics, while providing limited practical information about the data, analysis and conclusions. Specific points: | Thank you for your observation. We have improved the information presented on data, analysis, and conclusion in the revised manuscript. | No action needed. |  |
| SEM equations and other statistical definitions are well known and available from many sources, including the Stata manuals cited. In the paper, the material around p.12 could be much shortened, and written more accessibly. | Thank you for your comment and suggestions. The empirical model section is revised following your suggestion. We removed content from the manuscript’s “Method” section. | **Removed Content:**  Structural equation model has endogenous or outcome variables (variables with arrows pointed towards them) and exogenous or independent variables (variables with arrows pointed away from them) (Anderson and David, 1988; Gunzler and Morris, 2015). SEM is a two-step modeling approach using a confirmatory factor analysis method and specifies the relationship of observed variables to their respective latent variables which can intercorrelate freely. Paths in SEM are structured based on underlying theories (Anderson and David, 1988). The linkage between endogenous and exogenous variables are shown by structural equations (Gunzler and Morris, 2015). *The measurement error and the latent variables are modeled by measurement equations.* These two sets of equations can be written in general matrix form. The matrix form for the measurement equations is:  (1)  (2)  where, represents a vector of *r* unobserved latent exogenous variables measured by the *q* observed variables x. is a vector of *m* latent endogenous variables measured by the *p* observed variables *y*. and are vectors of intercepts, and are matrices of slopes also referred to as loading matrices and, and are residual terms in respective equations for y and x. and have dimensions of *p*\*1, and have dimensions of *q*\*1, and and have dimension of *q\*r* (Gunzler and Morris, 2015).  The structural model that relates unobserved latent variables to each other can be expressed as:  (3)  where, is *m*\*1 dimensional matrix of intercepts for the unobserved endogenous latent variables, is an *m\*m* matrix of slopes of the unobserved endogenous latent variables to each other,  is *m\*n* matrix of slopes for the unobserved exogenous latent variables, and is m\*1 vector of random error for unobserved endogenous latent variables (Gunzler and Morris, 2015).” |  |
| Standardized regression coefficients in SEM are generally not the same as correlations, so these terms should not be used interchangeably (p.13 and elsewhere). | Thank you for your observation. We have made a significant revision in the interpretation of the results. Your advice regarding the regression coefficient is much appreciated, and corrections are made appropriately. Please see our revisions in the “Model Result” section in the manuscript. | In Manuscript. | Manuscript Page #14-15, Line # 301 – 336. |
| Narrating each fit statistic and coefficient from the tables makes for dry, awkward reading. P.25 should be rewritten without most of the numbers but summarizing the main positive and negative findings. | Thank you for your suggestion. In the revised manuscript, the results section is much improved. We had discussed our results without mentioning coefficients in the narrative. The coefficients and fits statistics reported in the results narrative are deleted and presented only in the tables. The tables with statistics and coefficients are cited in the manuscript’s narrative to connect numbers in the tables and the discussion. Please see our revisions in the “Model Result” section in the manuscript, along with tables 3, 4, and 5. | In Manuscript. | Manuscript Page #14-15, Line # 301 – 336. |
| The sample is initially described as 508 landowner respondents (p.9), but on the next page missing values have apparently reduced this to n = 177, used for all the main analysis. That is quite an attrition, down to about a 7% response rate, and small sample for SEM. What happened? Implications for representativeness and multivariate analysis need discussion. | We agree that the response rate dropped down in the structure equation model. Nonetheless, the sample size is comparable to published SEM papers. Out sample size dropped from 508 to 168 because of two reasons. First, the missing values were removed on list-wise basis which means if a respondent hasn’t responded one variable included in the model, the respondent is excluded from the analysis. Second, the outliers in sample were removed from analysis and further discussed later in this file.  The adequacy of sample size in SEM is a frequently discussed topic. Wolf et al. (2013) studied the sample size requirement based on power and bias, but this study fails to give a clear guideline on the number of samples required. One such study that clearly talks speaks about number of sample required for SEM is Tanaka (1987), which recommends 10 observations per variable. Also, number of sample required to achieve acceptable power were 294, 147, and 73 for models with 6, 9, and 15 variables, respectively (Hoyle and Gottfredson, 2015) to test the hypothesis of close fit. There are 13-16 variables in our model. A sample size between 147 to 73 is adequate to run the SEM model, according to Tanaka (1987). Coon et al. (2020) also adopted the theory of planned behavior and normative model to study private landowner’s decision to manage non-native grass in eastern great plains. Their research reported a reduced number of samples from 514 to 141 after removing missing data in the analysis. Similarly, Lopez-Mosquera et al. (2014) extended the theory of planned behavior by adding the willingness to pay component in their SEM model, which was developed out of 190 responses. The number of samples used in Lopez-Mosquera et al. (2014) and (Coon et al., 2020) are comparable to our study.  Furthermore, the fit statistics presented in our paper indicate that the model is well fit. None of the models reported in this manuscript suffers non-convergence which is an indicator of a small or inadequate sample (Hoyle and Gottfredson, 2015).  In addition to all the statistical evidence presented above, we have checked all four models’ robust standard error following your suggestion. We are confident in our model and analysis presented in this revised manuscript. We agree that the small sample size is a concern for any form of statistical analysis. To this end, we have acknowledged the sample size issue as a study limitation in the discussion section. We also revised manuscript addressing this issue. | Another limitation of the study is that the sample size dropped from initially received responses while running the SEM model because missing responses were removed list-wise. List-wise deletion excludes respondent from the analysis if the respondent did not respond to all set of variables in the model ([StataCorp, 2017](#_ENREF_41)). This is not surprising because missing responses are common with the social surveys ([Dillman et al., 2014](#_ENREF_13)). Previous SEM studies also reported a drop in sample size ([Coon et al., 2020](#_ENREF_9); [Lopez-Mosquera et al., 2014](#_ENREF_27); [Lopez-Mosquera and Sanchez, 2012](#_ENREF_28)). Our sample size, nonetheless, is within the comparable range of other recent SEM studies ([Coon et al., 2020](#_ENREF_9); [Lopez-Mosquera et al., 2014](#_ENREF_27); [Lopez-Mosquera and Sanchez, 2012](#_ENREF_28)). | Manuscript Page #18, Line # 387-395. |
| The target population is described as landowners, but from the INTENT questions, it seems like the dependent variable is defined only for landowners who also are deer hunters? If so, this affects representativeness as well, and who the conclusions can apply to. | We agree that the target population seems like landowners who are deer hunters. However, our target population is landowners who have more than 160 acres of range and forest land, and almost all the respondents have reported that they own land. Therefore, they are deer hunters and landowners who hunt on their own property or rent and lease land for deer hunting.  Our survey questions related to intentions did not limit landowners to be deer hunters or vice versa. For example, “a7wtp” ask about “How many dollars/acres are you willing to spend to maintain the deer population you generally observe in that site to receive desired hunting experience?”. This question does not require a person to be a deer hunter. The person can be a landowner who maintains land for deer hunting for other deer hunters to lease and still occasionally go to their hunting site to access hunting site quality. The answer to this question for a landowner who goes to their hunting site to access quality can perceive this question differently than a hunter.  Another question, “Are you interested in knowing more about active forest or rangeland management in Oklahoma? ”, is targeted to a landowner who is interested in managing their land. Whether the landowners are a hunter or not, respondents respond to this question from the landowners’ perspective. So, we believe our target population is accurately reflected in the research.  In the revised manuscript, we have clarified this confusion. | The target population of this study was landowners with 160 acres or more land. Because most of the landowners are deer hunters who either hunt their own land or lease land for hunting the result may not necessarily reflect the opinions of landowners who hunt deer on public land or have smaller than 160 acres of land for hunting purpose. | Manuscript Page #18, Line # 396-399. |
| Most of the variables in Table 1 appear to be Likert-type scales, but the INTENT items (how many dollars per acre, how far would you drive, are you interested?) look different. What are the distributions of these items, and of the resulting composite? Do pairwise scatterplots show outlier or nonlinearity issues that affect their correlations/regressions with each other, or with other variables in the model? | Intent variables were transformed to be normally distributed following (Urbano et al., 2019). The mean and standard deviation of the transformed variables used in the SEM model is given below.  The two-way scatter plot for variables loaded in intent is presented below. We run the analysis before and after removing potential outliers in the data. The result does not differ significantly. However, the distribution of data after removing potential outliers is found to be better than the presence of outliers. So, we remove outliers from a9altdist and reran the analysis. The two-way scatter plot of variables loaded in the intent is given below in the graph.  The factor loading of variables in intent also improved after removing outliers in a9altdist. We reran the model after removing the outliers mentioned above. Even though the sample size decreased due to the removal of outliers, we believe that our model is improved. We addressed the change in the manuscript regarding the removal of outliers in the data analysis.  We also estimated Satorra–Bentler scaled standard error to address the issue of non-normality (Satorra and Bentler, 1994). The following sentence is added to reflect this change about Satorra–Bentler: | See Attached table and figure below.  Outliers in travel distance (> 100 miles) to alternative hunting site were excluded in the analysis.”  The robust Satorra-Bentler scaled standard error are estimated to address non-normality issue in data (Satorra and Bentler, 1994). | Manuscript Page #8, Line # 179-180.  Manuscript Page #11, Line # 225-127. |
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| I notice also that INTENT has a low alpha (.38) and very unequal loadings (.24 to .61), suggesting that this item is least coherent. | We agree. This issue was addressed in the discussion section. Latent variables developed from meticulously panned observed variables can also have lower Cronbach alpha (Ajzen, 2011). The alpha value of intent variables also increased to 0.50 after removing outliers, which indicates relatively better internal consistency. For clarification, we revised manuscript. | Further, intentions have a wide range of factor loading from 0.37 to 0.66 because the intentions variables are not measured in Likert scale. | Manuscript Page #18, Line # 383-385. |
| These last three points raise questions about the main dependent variable, which is the focus of theoretical interest upon which the conclusions rest. To credit those conclusions, we need evidence that this indicator and its analysis are robust. | Agreed. In the revised manuscript, we reran the statistical analysis calculated Robust standard error using “vce (sbeltler)” option in Stata and reported robust Satorra-Bentler scaled standard error. Please note that we also updated new values in the pictorial diagram (Figures 3 and 4). | Robust standard error estimated. |  |

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