



Biodiversity conservation versus wind power development in Oklahoma:

Assessing opinion where green interests collide

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Introduction

Movement towards renewable energy sources is one of the prevalent pushes in green economy initiatives globally; within this, wind energy has become the dominant method utilized to meet renewable energy goals. Wind energy was largely presumed to be environmentally “benign” and development in the 1990s and early 2000s was done without extensive research and development (UNEP, 2011). The “green or green” conflict refers to “choosing” between reducing energy emissions of greenhouse gases or preventing environmental impacts associated with renewable energy development (Swofford and Slattery, 2010; Devine-Wright, 2005). While renewable energy development can assist in alleviating the major pressures of overexploitation and climate change (UNEP, 2011), it can impact biodiversity via pressures such as habitat loss or animal mortality (Loss, Mill, & Marra, 2013).

The research presented in this project looks to focus on public perception in Oklahoma. There is a lack of research done to understand public opinion on wind farm development in the state despite the increased turbine development in recent decades. Understanding public perception of wind energy is complex, as exemplified in the literature of surveys done in other states or in other countries; focusing on one aspect, therefore, allows refinement of further research done to exclude or include certain factors. By focusing on environmental impacts, the project intends to provide evidence as to whether environmentally conscious individuals recognize and understand the conflict between biodiversity conservation and renewable energy and if they feel it is a trade-off worth pursuing.

Methods

1. Study Area

Oklahoma is a top state for wind energy production and contains areas of high wind energy production potential. Despite this, little work has been done to understand public opinion of wind energy development. This study is targeting environmentally conscious within Oklahoma; environmentally conscious people may recognize biodiversity conservation and renewable energy as two important concepts related to climate change adaption but do not realize these two often conflict.

2. Survey Questions

The research utilizes the Qualtrics survey program to create the survey. Distribution has been a mixture of in-person and e-mail distribution; at events in Oklahoma, the survey is presented to attendees on laptops and they are asked if they are willing to participate and complete survey there. For e-mail distribution, environmental organizations affiliated with the University of Oklahoma as well as non-university affiliated organizations have been identified and leaders have been asked if they are willing to distribute survey link to members to complete.

3. Data Processing

Final data processing will consist of a multivariate analysis of the collected data. Data will be analyzed in the context of the four research objectives to determine whether findings are statistically significant, whether they show a trend in opinion, and whether any of the demographic features relate to findings from the rest of the survey.

Research Objectives

1. Evaluate opinion of renewable energy development versus biodiversity conservation as two broad concepts.
2. Examine the awareness of the conflict between wind energy development and biodiversity conservation as well as awareness of current research on the topic.
3. Understand opinion of wind energy development being framed as an environmental issue and perceived issues or benefits.
4. Begin to explore perceived trade-offs between wind energy impacts related to biodiversity conservation and other identified impacts.

Preliminary Results (191 respondents)

Table 1. Evaluating opinion of renewable energy development versus biodiversity conservation.

Concept	Mean ^a
Renewable energy impacts the environment	4.84 – does not impact
Renewable energy impacts wildlife conservation specifically	4.08 – does not impact

^a Seven point scale from (1) negatively to (7) positively with (4) being does not impact

Table 2. Broad opinions of wind energy development and biodiversity conservation.

How much did individuals care about....	Mean ^b
Wind energy development	6.28 – care very much about
Biodiversity conservation	6.39 – care very much about

^b Seven point scale from (1) don't care to (7) care very much with (4) being indifferent

Table 3. Awareness of impacts of wind energy on various aspects of biodiversity conservation.

Wind turbines...	% didn't know	% said false	% said true
Cause bird mortality via collision.	7.41	8.47	84.13
Cause bat mortality via collision.	18.95	12.11	68.95
Cause internal injury in bats.	36.84	14.21	48.95
Make habitat unsuitable for wildlife.	12.63	48.94	38.42
Have infrastructure that may lead to habitat fragmentation	16.40	7.94	75.66
Cause erosion.	42.41	33.51	24.08
Leads to proliferation of invasive species.	41.58	31.58	26.84
Cause changes in local climate such as temperature range and precipitation levels.	27.89	50.53	21.58

Table 4. Proximity to the two topics of interest.

Do you live near...	% said yes	% said no	% didn't know
Wind energy development	21	75	4
Protected natural area	50	47	3

Significance

This data is preliminary, data is still being collected with a goal of 250 respondents by the end of April. There are additional components to my survey I did not include in the above results that will assist in answering my research objectives.

The goal of this study is to identify significant features or predominant concerns in the opinions of a self-identifying set of environmentally-conscious individuals with respect to biodiversity conservation versus wind energy development. This goal of the final research product is to provide insight into what issues arise in the conflict between biodiversity conservation versus renewable energy in the eyes of the environmentally educated section of the public.

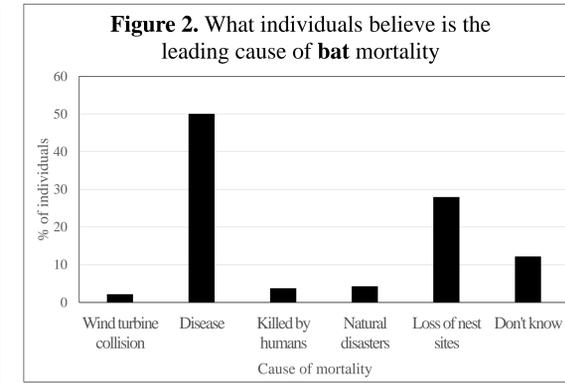
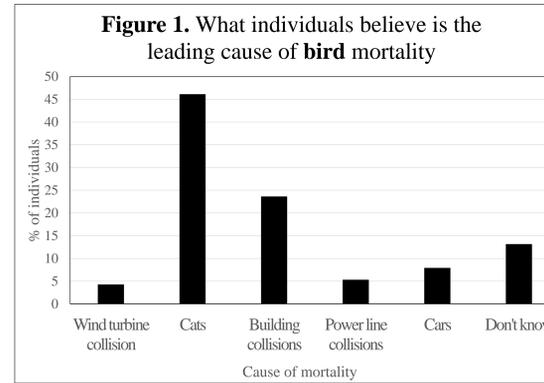


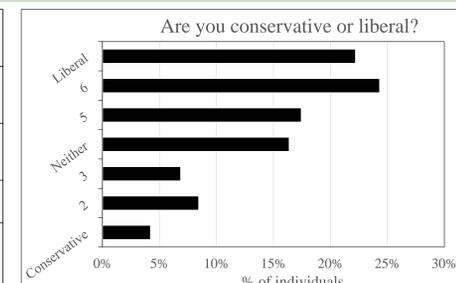
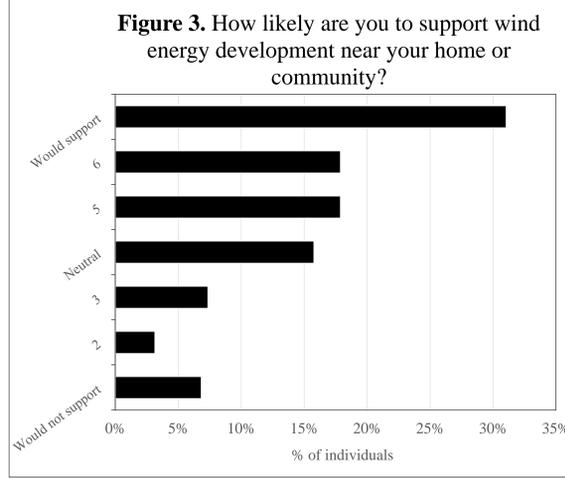
Table 5. Evaluation of the trade-offs individuals are willing to make.

Trade-off comparison	Mean ^c
No impact on health	3.54
Negative impact on biodiversity	
Led to economic opportunity	3.52
Negative impact on biodiversity	
Included public participation	3.49
Negative impact on biodiversity	
Higher energy prices	5
No impacts on biodiversity	
Directly accessible in an area	3.42
Negative impact on biodiversity	
Visually unappealing	4.81
No impacts to biodiversity	

^cSeven point scale from (1) would not support to (7) would support with (4) being indifferent

Table 6. Demographic descriptors of my respondents.

Average age	34 years old
Gender.	45% male and 55% female
Average years living in OK	19.24 years
Are you in higher education currently?	43% yes, 57% no
Political affiliation	46% Dem., 14% Rep., 28% Indep., 12% Other/None



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