Kansas birdwatchers and sustainable recreation: a mixed-methods examination of demographics and behavior

by

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Abstract

Birdwatching has grown in importance in recent decades as a type of recreation and tourism, but has largely escaped psychological research. Global growth has been reflected in the development of tourism companies, websites and guidebook coverage in the United States. New complexity and competition are reflected in the emergence of distinct sub-categories of birdwatchers. Birdwatching has been particularly significant in more remote places including deserts and wetlands, where more unusual and rare species are to be found. It has contributed to the economic development and environmental management of rural and remote areas, while also potentially causing environmental disturbances due to increased traffic. This study used internet-based surveys to identify birdwatchers attitudes, norms, perceived behavioral control, and intentions regarding local birding, through an application of the Theory of Planned Behavior. Results indicate subjective norms and perceived behavioral control provide potential leverage points for messaging to encourage local birdwatching. Specific recommendations for effective, theory-based interpretation strategies aimed at reducing long distance birding to habitats are provided.

Table of Contents

List of Figures v
List of Tables vi
Acknowledgements vii
Chapter 1 - An Examination Of Existing Tensions Between Local And Long-Distance birding In The Birdwatching Community 1
Chapter 2 - Understanding Birdwatchers Decisions Through The Theory Of Planned Behavior .. 7
Chapter 3 - A Research Note Demographic Profile Of Birdwatchers In The Sunflower State 29
References 41

List of Figures

Figure 1 TPB Framework 12
Figure 2 Path Diagram for Structural Equation Model..... 21

List of Tables

Table 1 Questions for TPB Constructs 16
Table 2 Sample Characteristics of Respondents 17
Table 3 Mean Value for Each Item and Reliability of the Scale 19
Table 4 Discriminant Validity 19
Table 5 Regression Path Coefficients 22
Table 6 Sample Characteristics of Respondents 35

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Chapter 1 - An Examination Of Existing Tensions Between Local And Long-Distance birding In The Birdwatching Community

In this chapter we will take a closer look at the existing literature of recreational birdwatching, and how it influenced the present study. We will review the themes of birdwatching as a recreational activity, the debate between local and long-distance birding, and the theoretical frameworks used to understand human behavior in wildlife recreation contexts. The chapter concludes by reviewing and identifying the gaps in the literature that this study addresses.

Introduction

Birdwatchers are one of the largest recreation groups in the United States and continue to grow every year with 96 million Americans engaging in birdwatching (U.S. Fish and Wildlife Service, 2024). Backyard birding is the most common action, with 95% of birders (91 million people) who watch from the comfort of their homes. Meanwhile, at least 44% (43 million people) traveled on birding trips a mile or more from home (U.S. Fish and Wildlife Service, 2024). In the United States alone, birdwatchers contribute billions of dollars to the economy each year, largely from expenditures for supplies and travel. According to the 2022 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, birdwatchers spend an estimated $107.6 billion on bird-related activities, generating a total economic output of $279 billion and supporting 1.4 million jobs (U.S. Fish and Wildlife Service, 2024).

While birdwatching as a whole has limited environmental impact relative to other forms of wildlife tourism, such as safaris or hunting lodges, some of its more specialized forms may not be as eco-friendly as they appear. A growing proportion of the birdwatching community, known

as birders (twitchers in the UK), is more actively engaged with seeking out species of interest and keeping records of their birding activities (Sheard, 1999). Such birders build lists of species encountered and organize those lists to track numbers of species encountered during their own lifetime, or a given year, and often travel long distances to encounter new or rare birds (Wood et al., 2011). Birders around the globe invest significant time and effort to observe rarities and add them to their personal lists, for example, in April 2017 several groups of people chartered four planes to fly because an American species, the Red-winged Blackbird had been spotted in the UK for the first time (Brock et al., 2020).

There exists a tension though around the idea of long-distance birding due to the perceived negative outcomes. This is because birdwatching depends on protecting the specific habitats that birds need, and some birding practices can work against that goal (Kronenberg, 2014). Travel generates probably the most evident environmental impact and extreme birdwatching (birding, twitching) involves extreme travel, including hiring private airplanes to get to a given remote location as quickly as possible (Kronenberg 2014). Some birdwatchers point out the issue of their carbon footprint associated with long-distance travel to see rare species, as well as the issue of when a rare bird is spotted and many people flock to the area, they may affect the birds by lowering the attractiveness of that site. Even in birdwatchers' communities, twitching is sometimes perceived as 'anti-environmental' (Kronenberg 2014). The paradox is that dedicated birders, who often express strong environmental values and belong to conservation organizations like the National Audubon Society (Booth et al., 2011), may generate substantial greenhouse gas emissions through their pursuit of rare birds. Understanding the factors that influence birdwatchers' choices between local and long-distance birding can inform efforts to promote more sustainable birding practices.

Local vs Long Distance Birding

Within the birding community, debates exist about the advantages of local birding versus traveling for rare species. Some argue that focusing on local birds promotes deeper ecological knowledge, reduces environmental impact, and supports long-term monitoring efforts that are important for conservation (Randler et al., 2020). Advocates of long-distance birding argue that the pursuit of rare species generates economic benefits for rural communities, raises awareness of bird conservation issues, and contributes to citizen science through documentation of vagrant species and range expansions (Callaghan et al., 2018; Brock et al., 2020).

Some birdwatchers raise important concerns about the environmental impacts of birding, particularly the carbon footprint associated with long-distance travel to see rare species (Kronenberg 2014). The paradox is that dedicated birders, who often express strong environmental values and belong to conservation organizations like the National Audubon Society (Booth et al., 2011), may generate substantial greenhouse gas emissions through their pursuit of rare birds. This tension between local and long-distance birding represents an important area for investigation because it sits at the intersection of conservation values and recreational behavior. Birders are often deeply committed to protecting birds, yet the pursuit of rare species can work against the very habitats and populations they care about (Booth et al., 2011; Kronenberg, 2014). Research during the COVID-19 pandemic provided insights into how birders adapt their behavior under constraints. Randler et al. (2020) found that the pandemic significantly impacted birding behavior, with 85% of respondents reporting changes to their activities. Most notably, birding became more local and focused on backyard birding, with reduced travel to distant sites. This adaptability suggests that birders can modify their behavior

when circumstances require, raising questions about the factors that normally drive long-distance birding.

Birdwatching in Kansas

Given its location, Kansas serves as an ideal spot for this investigation due to its position at the hub of North American migration corridors. In the west north central region of the country, there is around 7 million active birdwatchers every year (U.S. Fish and Wildlife Service, 2024). The Central and Mississippi Flyways are two of the major migration corridors funneling millions of birds between breeding grounds in the north and wintering grounds in the south each year. (Janzen & Gress, 2025; KSNT, 2025). Up to 800 million birds are forecasted to migrate through Kansas during peak seasons, taking advantage of critical stopover habitats like Cheyenne Bottoms and Quivira National Wildlife Refuge with a total of 486 unique avian species being documented in the state, (KSNT, 2025). Cheyenne Bottoms, a 41,000-acre wetland complex and designated Wetland of International Importance, hosts tens of thousands of shorebirds and up to 250,000 waterfowl during migrations (The Nature Conservancy, 2024). Of the 486 bird species known to Kansas, 356 have been observed at Cheyenne Bottoms, making it one of the most diverse birding locations in the state (The Nature Conservancy, 2024). The nearby Quivira National Wildlife Refuge provides a 22,000-acre mix of sand prairie, freshwater wetlands, and salt flats that support hundreds of migratory bird species, and approximately one-fifth of the entire wild population of whooping cranes stops over at Quivira each year (U.S. Fish and Wildlife Service, 2025).

The economic impact of birding in Kansas is substantial. Birdwatchers contribute to the state economy through expenditures on travel, supplies, and lodging. The total impact of visitor expenditures of visitors at Cheyenne Bottoms is around $1.9 million a year (Kansas Institute for

Policy and Social Research, 2023). These visitors support local businesses, including hotels, restaurants, and retail stores, particularly in rural communities near major birding hotspots (The Nature Conservancy, 2024). Audubon of Kansas hosts birding festivals such as the Celebration of Cranes and the Kansas Lek Treks Prairie-Chicken Festival, which draw participants from across the country (Audubon of Kansas, 2025). These existing initiatives demonstrate the importance of birding to Kansas and the potential for targeted management strategies to influence birding behavior.

Literature Gaps And Purpose

Management scenarios that have come forward illustrate the need for this study. The emergence of rare bird sightings often draws large numbers of birders to specific locations, creating management challenges related to visitor congestion, habitat disturbance, and trespassing (Booth et al., 2011; Laney et al., 2021). In some cases, the influx of birders to see a rare bird has led to trail erosion, trampling of vegetation, and stress to the birds themselves (Kronenberg, 2014). The tension between local and long-distance birding reflects broader debates in sustainable tourism about balancing economic benefits, environmental impacts, and personal fulfillment.

Indirect management uses a communication process known as interpretation that aims to reveal meanings and relationships through direct experience with objects, artifacts, landscapes, or sites (Freeman et al., 2021). In parks and protected areas, interpretation serves as a primary tool for indirect management, encouraging visitors to behave in ways that support management objectives without the need for regulations or restrictions (Freeman et al., 2021). Effective interpretation connects with visitors' values and beliefs to influence behavior. Research has demonstrated that interpretive messages using behavioral theory can be more effective than generic educational approaches because they target the specific psychological factors that drive

behavior (Stern, 2018). For example, studies in national parks have shown that messages framed around visitor experience or resource protection can lead to more conservative visitor behaviors compared to standard park messaging (VanderWoude et al., 2018). One theory that has been widely used to guide interpretive and educational messages that are intended to influence behavior is the Theory of Planned Behavior (TPB).

TPB is useful for understanding specific behaviors and designing persuasive communications (Stern, 2018), and so numerous studies have relied on TPB to explore the social aspects of human-wildlife interactions. Martin and McCurdy (2009) found that attitudes and subjective norms explained 38 to 43% of backpackers' intentions to use bear canisters in Yosemite National Park, and Miller et al. (2019) used the TPB to identify specific beliefs that could be targeted through interpretive messaging for bear spray use in Yellowstone National Park. Of particular relevance to the present study, Jafarpour and Ramkissoon (2025) found that subjective norms had the greatest influence on predictors of Malaysian birders' intentions, suggesting that social norms may be a particularly important driver of birder behavior.

While economic impacts and travel patterns of birders have been documented, less is known about the psychological factors driving birdwatchers decisions between local and long-distance birding. Although the birdwatching community is highly social, the role of social norms in shaping individual behavior decisions requires further investigation (Randler & Großmann, 2022). Additionally, little research has examined factors that might promote more local, sustainable birding practices among dedicated birders. These gaps highlight the need for an examination of the psychological components that influence birding behavior, and this study seeks to provide insights into the psychological mechanisms that drive or constrain birding behavior and to inform efforts to promote more sustainable birdwatching practices.

Chapter 2 - Understanding Birdwatchers Decisions Through The Theory Of Planned Behavior

Introduction

Birdwatchers are one of the largest recreation groups in the United States and continue to grow every year with 96 million Americans engaging in birdwatching (U.S. Fish and Wildlife Service, 2024). They are defined as individuals who observe wild birds in their natural habitats as a recreational activity. In the United States alone, birdwatchers contribute billions of dollars to the economy each year, largely from expenditures for supplies and travel. According to the 2022 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, birdwatchers spend an estimated $107.6 billion on bird-related activities, generating a total economic output of $279 billion and supporting 1.4 million jobs (U.S. Fish and Wildlife Service, 2024). We can see from this that the birdwatching community has the ability to output large impacts across the US due to their size and influence.

While birdwatching has limited environmental impact relative to other forms of outdoor recreation, some of its more specialized forms may not be as eco-friendly as they appear. A growing proportion of the birdwatching community, known as birders, are more actively engaged with seeking out species of interest and keeping records of their birding activities (Sheard, 1999). Such birders build lists of species encountered and organize those lists to track numbers of species encountered during their own lifetime, or a given year, and often travel long distances to encounter new or rare birds (Wood et al., 2011). Birders around the globe invest significant time and effort to observe rarities and add them to their personal lists. In the US, around 43 million people travel away from their local community for birdwatching every year (U.S. Fish and Wildlife Service, 2024). Travel generates probably the most evident

environmental impact and extreme birdwatching (birding, twitching) involves extreme travel, including hiring private airplanes to get to a given remote location as quickly as possible (Kronenberg, 2014). Some birdwatchers point out the issue of their carbon footprint associated with long-distance travel to see rare species, as well as the issue of when a rare bird is spotted and many people flock to the area, they may affect the birds by lowering the attractiveness of that site. Even in birdwatchers' communities, twitching is sometimes perceived as 'anti-environmental' (Kronenberg 2014). The paradox is that dedicated birders, who often express strong environmental values and belong to conservation organizations like the National Audubon Society (Booth et al., 2011), may generate substantial greenhouse gas emissions through their pursuit of rare birds.

Understanding the factors that influence birdwatchers' choices between local and long-distance birding can inform efforts to promote more sustainable birding practices. At the national scale, organizations like the Audubon Society and the Cornell Lab of Ornithology have a large impact on how birdwatchers gain information on birds and the ways they choose to recreate. Audubon operates over 400 local chapters across the United States and runs the annual Christmas Bird Count, which engages tens of thousands of volunteers in their local areas in bird monitoring (National Audubon Society, 2024). The Cornell Lab of Ornithology manages eBird, a citizen science platform where birders submit observations, and which recently surpassed one billion observations globally, demonstrating its reach and influence on the birding community (Sullivan et al., 2009).

Study Area

Kansas serves as an ideal spot for this investigation due to its position at the hub of North American migration corridors. The Central and Mississippi Flyways are two of the major

migration corridors funneling millions of birds between breeding grounds in the north and wintering grounds in the south each year (Janzen & Gress, 2025; KSNT, 2025). Up to 800 million birds are forecasted to migrate through Kansas during peak seasons, taking advantage of critical stopover habitats like Cheyenne Bottoms and Quivira National Wildlife Refuge with a total of 486 unique avian species being documented in the state, (KSNT, 2025). Cheyenne Bottoms, a 41,000-acre wetland complex and designated Wetland of International Importance, hosts tens of thousands of shorebirds and up to 250,000 waterfowl during migrations (The Nature Conservancy, 2024). Of the 486 bird species known to Kansas, 356 have been observed at Cheyenne Bottoms, making it one of the most diverse birding locations in the state (The Nature Conservancy, 2024). The nearby Quivira National Wildlife Refuge provides a 22,000-acre mix of sand prairie, freshwater wetlands, and salt flats that support hundreds of migratory bird species, and approximately one-fifth of the entire wild population of whooping cranes stops over at Quivira each year (U.S. Fish and Wildlife Service, 2025).

Agencies like the Kansas Department of Wildlife and Parks (KDWP) play a critical role in managing wildlife resources and providing recreational opportunities. KDWP manages over 100 state parks, wildlife areas, and fishing lakes across Kansas, and operates six nature centers that serve as hubs for environmental education and interpretation (KDWP, 2024). The agency also sponsors events like Eagle Days and the Kansas Birding Big Year contest, which encourage birders to observe and record species within the state.

These existing programs and infrastructure in Kansas represent opportunities for promoting local birding behaviors, and we have already seen scenarios that show the need for this work. For example, the emergence of rare bird sightings often draws large numbers of birders to specific locations, creating management challenges related to visitor congestion, habitat disturbance, and

trespassing (Booth et al., 2011; Laney et al., 2021). Additionally, the carbon footprint associated with long-distance travel for rare species presents a paradox for birders who express strong environmental values but may generate substantial greenhouse gas emissions through their pursuit of rare birds (Booth et al., 2011; Kronenberg, 2014). These scenarios highlight the need for effective management strategies that can influence birding behavior while maintaining the recreational and economic benefits of the activity.

Interpretation

Managers typically rely on two primary approaches when addressing recreation impacts: indirect and direct management (Freeman et al., 2021). Direct management involves regulations, restrictions, and enforcement, such as closing areas to access or requiring permits. Indirect management focuses on education, interpretation, and communication to influence visitor behavior voluntarily. Indirect management is often preferred because it preserves visitor freedom and can be more cost-effective than enforcement, but its success depends on understanding what actually drives visitor behavior. Indirect management uses strategies based around persuasive messaging to help influence visitor behavior in parks and natural spaces. Previous research has demonstrated that interpretive messages using behavioral theory can be more effective than generic educational approaches (Freeman et al., 2021).

One theory that has been widely used to guide interpretive and educational messages that are intended to influence behavior is the Theory of Planned Behavior (TPB). TPB is useful for understanding specific behaviors and designing persuasive communications (Stern, 2018), and numerous studies have demonstrated its effectiveness in predicting behavioral intentions in recreation and wildlife contexts (Rossi & Armstrong, 1999; Miller, Freimund et al., 2019). By applying TPB to understand the psychological drivers of birders' decisions, managers can design

more effective interpretive messages that target the specific factors that influence behavior, such as social norms and perceived behavioral control (PBC), rather than relying on generic educational approaches. This study uses TPB to identify leverage points that could aid in developing effective persuasive interpretation strategies for reducing long-distance birding and promoting more sustainable local birding practices.

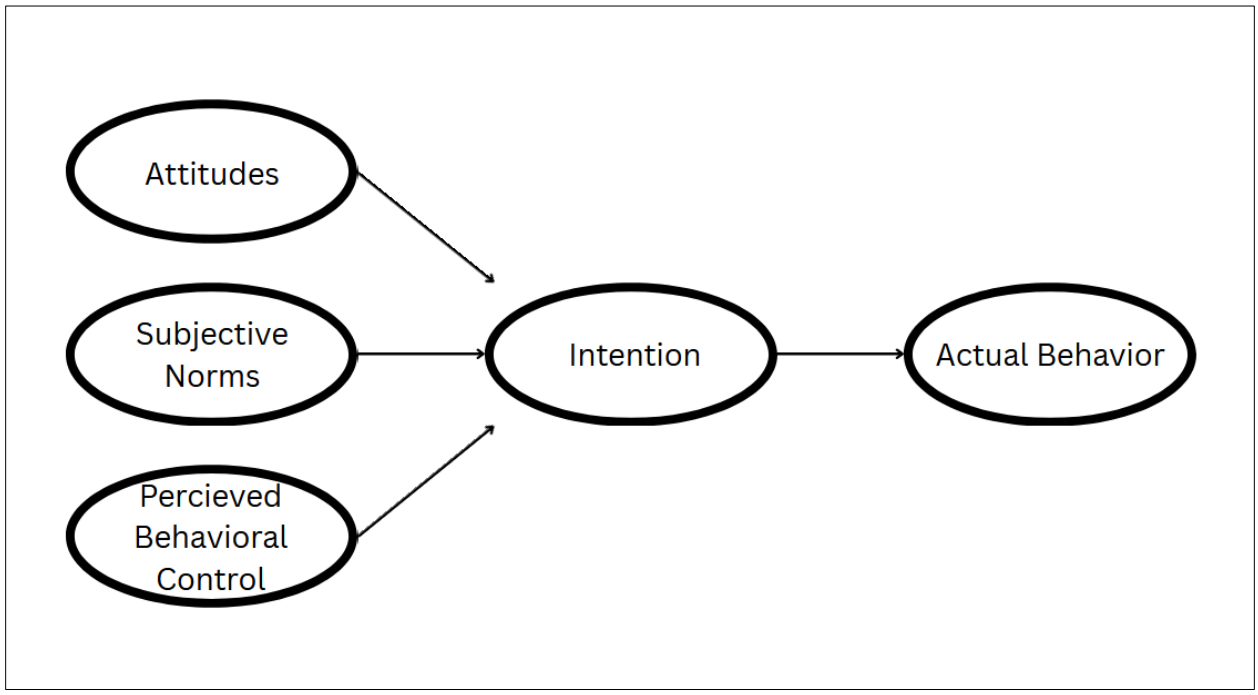
Theory of Planned Behavior

TPB is a general theory of social psychology that strives to explain human behavior. The overarching assertions of the TPB are that individuals make behavioral decisions based on beliefs, and the most accurate predictor of their behavior is the intention to engage in a particular behavior (Ajzen, 1991). According to the TPB, intention is a function of attitude toward a behavior and subjective norms, which is how others feel about the behavior. Additionally, behavioral intentions are based on behavioral beliefs, normative beliefs and control beliefs which is the belief that one has the knowledge, skill, and resources to engage in a particular behavior (Lawhon & Taff , 2020). TPB posits that attitudes, subjective norms, and perceived behavioral control can accurately predict the behavioral intentions of an individual and his or her eventual behavior (Ajzen, 1991; Fishbein & Ajzen, 1975).

TPB is useful for understanding specific behaviors and designing persuasive communications (Stern, 2018), and so numerous studies have relied on TPB to explore the social aspects of human-wildlife interactions. Martin and McCurdy (2009) found that attitudes and subjective norms explained 38 to 43% of backpackers' intentions to use bear canisters in Yosemite National Park, and Miller et al. (2019) used the TPB to identify specific beliefs that could be targeted through interpretive messaging for bear spray use in Yellowstone National Park. Of particular relevance to the present study, Jafarpour and Ramkissoon (2025) found that subjective norms

had the greatest variance among predictors of Malaysian birders' intentions, suggesting that social norms may be a particularly important driver of birder behavior. TPB has also been applied in the study of hunting participation (Rossi & Armstrong, 1999), voting on wolf reintroduction policies (Pate et al., 1996), and carrying bear spray (Miller, Freimund et al., 2019). However, no prior studies have applied the TPB to understand birders' decisions between local and long-distance birding, which is the gap this study addresses.

Figure 1 TPB Framework



TPB Constructs Chart, modeled from Ajzen, I. (1991)

Research Purpose

Indirect Management uses a communication process known as interpretation that aims to reveal meanings and relationships through direct experience with objects, artifacts, landscapes, or sites (Freeman et al., 2021). In parks and protected areas, interpretation serves as a primary tool for indirect management, encouraging visitors to behave in ways that support management

objectives without the need for regulations or restrictions (Freeman et al., 2021). Effective interpretation connects with visitors' values and beliefs to influence behavior. Research has demonstrated that interpretive messages using behavioral theory can be more effective than generic educational approaches because they target the specific psychological factors that drive behavior (Stern, 2018). For example, studies in national parks have shown that messages framed around visitor experience or resource protection can lead to more conservative visitor behaviors compared to standard park messaging (VanderWoude et al., 2018). The TPB offers a practical framework for designing interpretation because it identifies the specific beliefs and social factors that managers can target through persuasive communication (Stern, 2018). By understanding which TPB constructs most strongly influence birders' intentions, managers can develop interpretive messages that are more likely to encourage local birding and reduce the environmental impacts associated with long-distance travel.

To address the gaps identified in the literature and achieve the aim of this study, four research questions were developed to guide the investigation. While economic impacts and travel patterns of birders have been documented, less is known about the psychological factors driving birdwatchers decisions between local and long-distance birding. Although the birdwatching community is highly social, the role of social norms in shaping individual behavior decisions requires further investigation. Additionally, little research has examined factors that might promote more local, sustainable birding practices among dedicated birders. These gaps highlight the need for an examination of the psychological components that influence birding behavior. These questions were designed to examine the specific TPB components, attitudes, social norms, and perceived behavioral control, that influence Kansas birders' intentions to bird primarily in their local community rather than travel long distances for rare species sightings. This study

seeks to provide insights into the psychological mechanisms that drive or constrain birding behavior and to inform efforts to promote more sustainable birdwatching practices.

1. What are Kansas birders' attitudes, subjective norms, and perceived behavioral control related to local birding?
2. Which TPB components most strongly predict intention to bird locally?

Methods

This study used a quantitative survey design to examine the psychological factors influencing Kansas birders' intentions to bird locally. A survey approach was selected because it allowed us to reach a large number of birders across the state and measure the attitudes, subjective norms, and behavioral control that the Theory of Planned Behavior (TPB) identifies as predictors of behavioral intention (Ajzen, 1991). The TPB is well suited to this kind of investigation because it provides a tested framework for identifying which components influence behaviors. This information can be used by managers to intentionally design interpretation and communication strategies (Stern, 2018). Because our research questions asked which TPB components most strongly predict intention to bird locally, a survey with standardized items was the most direct way to collect comparable data from a large sample and test those relationships statistically.

Data used in this study were collected through surveys used to inform the Kansas Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2027-2037. The federal Land and Water Conservation Fund (LWCF) program requires a SCORP from each state prior to receiving LWCF financial assistance for the acquisition and development of outdoor recreation resources. A SCORP is designed to assess the outdoor recreation needs of a state's residents and visitors, including specific user groups such as birders, to ensure that LWCF funded projects reflect the priorities of the public. The SCORP serves as a planning tool that agencies use to identify gaps in

recreation opportunities and allocate resources accordingly. The survey instrument was developed with input from the Kansas Department of Wildlife and Parks. The questions were designed to understand what outdoor recreation activities people currently participate in (and how often), what they would like to see more of, at what types of places do they recreate and what barriers there may be to their participation. By including TPB-based questions in the survey, this study directly captured the psychological factors influencing birders' decisions, providing state agencies with targeted information on how to promote local birding and sustainable recreation. Rather than assuming birders' motivations based on observed behaviors, this approach allows managers to understand the specific social and practical drivers behind their choices, enabling more strategic and effective planning efforts.

The newest SCORP for Kansas used a Recreation User Survey to receive data from people who recreate in Kansas natural and municipal spaces, which allows us a broad range of recreationists to survey for this study. The primary data collection effort took place via online survey (i.e. Qualtrics) during the first six months of 2026 after approval was gained from IRB (13067). A database of email addresses from 251,390 Kansas outdoor recreation users were acquired from KDWP. In all cases, the potential survey participant was 18 years of age or older. An overall response rate of 5.99% (15,058 surveys) was obtained, which is within accepted standards (Vaske, 2008). An initial email was sent to all valid participants, and then two successive reminders (one week apart for both) were sent to those who had not already completed the survey.

For the participants who took the user survey, not all of them were shown the block that contained the TPB matrix. Previously in the survey, if they answered that they have participated in birdwatching, wildlife viewing, or wildlife photography, anytime in the last 12 months, the

question block for the TPB examination was available for them to participate in and we used 1,045 complete responses for the TPB section of the survey. This block included four matrix questions which asked about attitudes, subjective norms, perceived behavioral control (PBC), and intentions as you can see in Table 1.

Table 1 Questions for TPB Constructs

Latent Construct	Variable Code	Variable
Attitudes	AT1	Impractical-Practical
	AT2	Bad-Good
	AT3	Worthless-Valuable
	AT4	Unnecessary-Necessary
	AT5	Undesirable-Desirable
Subjective Norms	SN1	Most people who are important to me think I should choose to bird primarily in my local community rather than traveling long distances for rare species sightings.
	SN2	Other birders I know think I should choose to bird primarily in my local community rather than traveling long distances for rare species sightings.
	SN3	Members of birding groups or clubs I belong to think I should choose to bird primarily in my local community rather than traveling long distances for rare species sightings.
	SN4	People I interact with in birding-related social media think I should choose to bird primarily in my local community rather than traveling long distances for rare species sightings.
	SN5	Wildlife or land-management agencies think I should choose to bird primarily in my local community rather than traveling long distances for rare species sightings.
		For me, choosing to bird primarily in my local community rather than traveling long distances for rare species sightings…
Perceived behavioral control	PBC1	…is entirely up to me.
	PBC2	…is something I feel confident I can do.
	PBC3	…would be easy for me in most situations.
	PBC4	…would be difficult because of limited birding opportunities nearby.
		In the next 6 months, I intend to…
	INT1	I intend to choose to bird primarily in my local community rather than traveling long distances for rare species sightings.
Intentions	INT2	I plan to choose to bird primarily in my local community rather than traveling long distances for rare species sightings on most of my birding trips.
	INT3	Even when opportunities arise to travel for rare species, I intend to choose to bird primarily in
	INT4	my local community rather than traveling long distances for rare species sightings.

Data Analysis

Analyses were performed using SPSS V31 and R studio. Data cleaning commenced prior to analysis (i.e., removal of blank surveys that had been started but not completed). Summary statistics were conducted to measure percentages, mean values, and standard deviations for all questions. Following this, internal consistency for each of the four constructs was assessed using

Cronbach's alpha. Structural equation models (SEM) were used to evaluate the relationship between attitudes, social norms, and perceived behavioral control related to respondents' behavioral intentions to bird primarily in their local community. The reason for the use of this, was to find out which of the three TPB constructs, holds the most influence over birders decisions. The SEM was estimated using the Maximum Likelihood estimation ("MLE") method. Assessment of goodness-of-fit (GOF) of the models was done using multiple indicators: χ^2 (Chi-square), CFI (comparative fit index), TLI (Tucker-Lewis index), RMSEA (root mean square error of approximation), and SRMR (standardized root mean squared residual). The SEM was conducted using lavaan package in R (Rossel, 2012).

Results

Sample Statistics

The survey was distributed to 251,390 people, and 15,058 quality responses were received, which is a response rate of ~5.99%. Of those 15,058 responses, we used 1,045 clean responses for the TPB section of the survey. Descriptive statistics in Table 2 summarize that a majority of the respondents in the sample identify as male, with a bachelor's degree, in a two-person household, and average household income being $100,000-125,000 a year.

Table 2 Sample Characteristics of Respondents

Variables	Categories	Frequency*	Percentage (%)*
Gender	Male	641	58
	Female	442	40
	Other	1	0.1
Age*	70	53	4.8
	68	46	4.2
	67	45	4.1
Household Size	1	133	12

	2	636	57.5
	3	150	13.6
	4	128	11.6
	5	43	3.9
	6	12	1.1
	7	2	0.2
	8+	1	0.1
Education	Bachelor's degree	359	32.5
	Graduate or Professional Degree	307	27.8
	Some college, no degree	147	13.3
	High school diploma or GED	98	8.9
	Associate Degree	85	7.7
	Trade/Vocational School	49	4.4
	Prefer not to answer	36	3.3
	Some high school, no degree	18	1.6
Personal Income - Yearly	Less than $20,000	15	1.4
	$20,000-$34,999	38	3.4
	$35,000-$49,999	82	7.4
	$50,000-$64,999	108	9.8
	$65,000-$79,999	121	10.9
	$80,000-$99,999	140	12.7
	$100,000-$124,999	173	15.6
	$125,000-$149,999	97	8.8
	$150,000-$199,999	116	10.5
	$200,000 or more	84	7.6

Note:* Top three categories selected for this variable.

Confirmatory Factor Analysis

Internal consistency for each of the four constructs was assessed using Cronbach's alpha. All constructs demonstrated robust internal consistency and reliability, with alpha values exceeding the acceptable threshold of 0.70 (Kilne, 2023). The results were as follows: Attitude ($\alpha = 0.85$), Social Norm ($\alpha = 0.88$), Intention ($\alpha = 0.90$), and Perceived Behavioral Control (PBC; $\alpha = 0.82$) (Table 3). PBC4 was removed from the Perceived Behavioral Control scale to achieve this alpha value. A Confirmatory Factor Analysis (CFA) was performed to further validate the convergent and discriminant validity of the measurement model. The results indicated a good fit to the data: $\chi^2 = 648.19$, $p < .001$, $df = 113$, $CFI = 0.947$, $TLI = 0.936$, $RMSEA = 0.067$, and $SRMR = 0.038$.

Convergent validity was established by Standardized factor loading and Average Variance Extraction (AVE). All factor loadings were significant and above 0.5 (Table 1), and the AVE values exceeded 0.5 (Fornell and Larcker, 1981) (Table 3), demonstrating strong convergent validity. Discriminant validity was evaluated by comparing the square root of AVE for each construct to the correlations between constructs (Fornell and Larcker, 1981). As shown in Table 4, the square root of the AVE for each construct was greater than its correlations with the other constructs, thus confirming good discriminant validity (Paul et al., 2016).

Table 3 Mean Value for Each Item and Reliability of the Scale

Latent variable	Item	Mean	Cronbach's α	Standardized factor loading (λ)	AVE	Omega
Attitude	AT1	5.84	0.85	0.64	0.54	0.85
	AT2	5.60		0.79		
	AT3	5.68		0.83		
	AT4	4.89		0.63		
	AT5	5.43		0.79		
Social norms	SN1	3.72	0.88	0.71	0.60	0.88
	SN2	3.54		0.83		
	SN3	3.55		0.87		
	SN4	3.53		0.87		
	SN5	3.66		0.61		
Perceived behavioral control	PBC1	6.16	0.82	0.63	0.63	0.81
	PBC2	5.93		0.94		
	PBC3	5.67		0.79		
	PBC4	3.10		-		
Behavioral intention	INT1	5.32	0.90	0.88	0.69	0.90
	INT2	5.21		0.91		
	INT3	4.50		0.72		
	INT4	5.14		0.84		

Table 4 Discriminant Validity

Constructs	AT	SN	PBC	BI
Attitude (AT)	0.736			

Social Norms (SN)	0.159	0.77		
Perceived Behavioral Control (PBC)	0.363	0.00	0.79	
Behavioral Intention (BI)	0.297	0.30	0.32	0.84

TPB Constructs

Attitudes

Participants were asked about their attitudes toward choosing to birdwatch in their local community (Table 3). Attitudes were measured on 7-point bipolar scales where the largest number represented a more favorable attitude (e.g., Difficult=1, Easy=7). Most responses revealed favorable attitudes toward birdwatching in their local community. The highest mean belonged to the “practical” item with a 5.84 mean response.

Subjective Norms

Participants were asked about their subjective norms regarding choosing to birdwatch in their local community (Table 3). Subjective norms were measured on a 7-point Likert scale where higher numbers indicated stronger perceived social pressure (e.g., Strongly Disagree=1, Strongly Agree=7). Unlike attitudes and PBC, most responses revealed neutral to slightly negative perceptions of social pressure to bird locally. The highest mean belonged to the "Most people who are important to me" item with a 3.72 mean response.

PBC

Participants were asked about their perceived behavioral control regarding choosing to birdwatch in their local community (Table 3). PBC was measured on a 7-point Likert scale where higher numbers indicated a stronger sense of control or ease (e.g., Strongly Disagree=1, Strongly

Agree=7). Most responses revealed high perceived control over birdwatching locally. The highest mean belonged to the "Is entirely up to me" item with a 6.16 mean response.

Structural Equation Model

Following the validation of the measurement model, SEM was used to test the hypothesized relationships between attitudes, subjective norms, PBC, and intentions. The fit statistics indicated an excellent fit for the model: $\chi^2 = 648.19$, $p < .001$, df = 113, CFI = 0.947, TLI = 0.936, RMSEA = 0.067, and SRMR = 0.038. The R2 value for the model was 0.22, indicating that the three predictor variables account for 22% of the variation in intention to bird inside their local community. The results showed that all three independent variables had a statistically significant and positive influence on behavioral intention. Social Norm ($\beta = 0.28$, $p < 0.001$) was found to be the strongest predictor of intention. Perceived Behavioral Control ($\beta = 0.27$, $p < 0.001$) also emerged as a significant and strong driver (Figure 2; Table 4). Attitude ($\beta = 0.16$, $p < 0.05$) had a comparatively weaker, yet still significant, positive effect on intention.

Figure 2 Path Diagram for Structural Equation Model

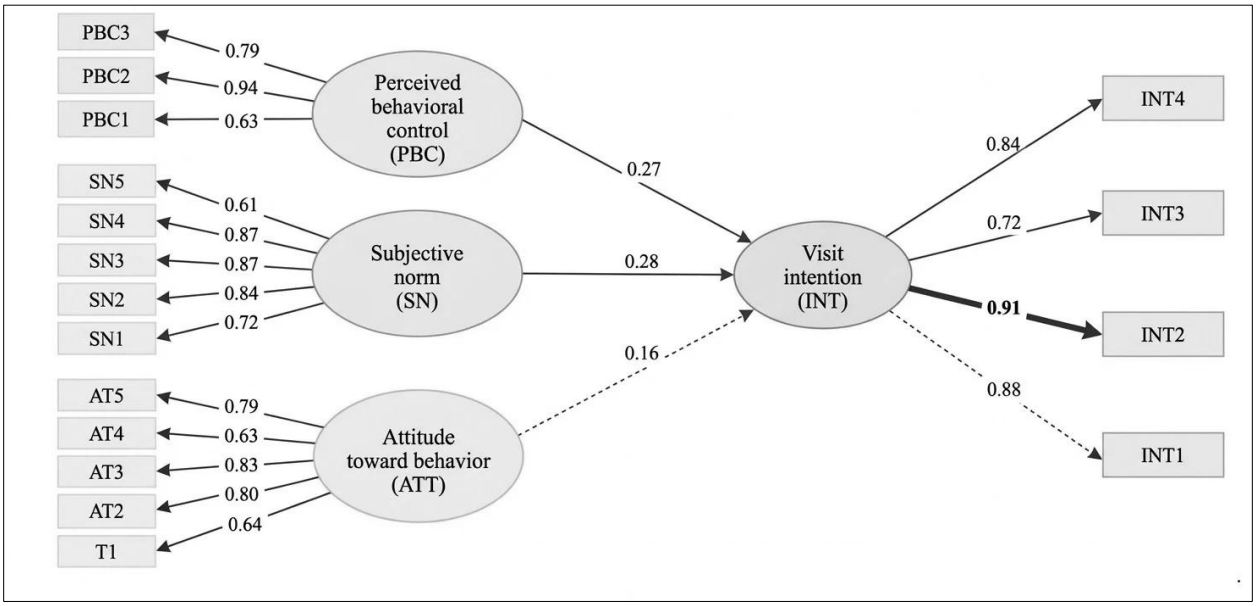


Table 5 Regression Path Coefficients

Paths	Estimate	Std. Err	*Z*-value	Standardized path coefficients
BI ~ AT	0.20	0.05	4.14	0.16
BI ~ SN	0.36	0.04	8.50	0.28
BI ~ PBC	0.45	0.06	7.58	0.27

Note: BI = Behavioral intention; AT = Attitude; SN = Social norms; PBC = Perceived behavioral control.

The structural equation model demonstrated good fit with the data, confirming the applicability of the TPB framework in predicting Kansas birders' intentions to bird primarily in their local community rather than traveling long distances for rare species sightings. The model explained 22% of the variance in behavioral intention, indicating that the three TPB constructs collectively account for a meaningful portion of the decision-making process. Among the predictors, social norms emerged as the strongest influence on intention ($\beta = 0.28$, $p < 0.001$), followed closely by perceived behavioral control ($\beta = 0.27$, $p < 0.001$), while attitude had a comparatively weaker but still significant effect ($\beta = 0.16$, $p < 0.05$). These findings suggest that for Kansas birders, the decision to bird locally is driven more by social norms and perceived behavioral control than by personal attitude alone.

Discussion

The results of this study demonstrate that social norms and perceived behavioral control were the strongest predictors of intention to bird primarily in one's local community rather than traveling long distances for rare species sightings, while attitude had a comparatively weaker effect. The findings of the present study differ from previous TPB studies which have found attitudes to be the strongest predictor of intentions (Martin & McCurdy, 2009; Miller et al., 2019). For managers, this finding is important because it suggests that efforts to promote local birding should not focus resources on modifying attitudes, but instead could focus on developing the social environment and removing practical barriers for birdwatchers.

Social norms were the strongest predictor of intention. This is in line with previous research that has identified social aspects as important predictors of participation in birding events (Randler & Großmann, 2022). This shows us that birder's decisions to bird locally are heavily influenced by what they believe other birdwatchers, important people, and management organizations expect of them. On average, participants did not report feeling strong social pressure from other birdwatchers to stay local, but they did perceive pressure from agencies such as KDWP. For managers, this suggests that agencies are already viewed as a credible authority and can be used as a leverage point for encouraging local birding. Studies in Haleakalā National Park found that messages from park officials significantly influenced visitors' subjective norms and behavioral intentions, with both intentions to explore sensitive areas and observed exploration behavior significantly lower among visitors receiving persuasive treatment messages (Reigner, 2009) Managers can use the same approach by using agency communication methods to signal that local birding is a valued and expected practice within the community.

Perceived behavioral control was the second strongest predictor of intention. Interestingly, the results of this study almost align with those of Seong and Hong (2021), which found PBC to be the strongest predictor of visit intentions to national parks during COVID-19, because it was an activity perceived as being within the individual's control. In the present study, increased confidence in one's ability to bird locally increased their intentions to do so. Managers might consider fostering greater perceived behavioral control by appealing to participants' interest in discovering local birds. Interpretation that provides information on local birding hotspots, trail maps, and programs to improve local bird identification skills has the potential to influence local birding behavior.

Attitude was a significant but comparatively weaker predictor of intention. On average, participants' attitudes towards local birding were generally positive, telling us that birders already value local birding. However, the weaker effect of attitude suggests that positive feelings alone are not enough to impact intentions without also having social support and perceived ability. For managers, this means that campaigns focused solely on promoting the environmental benefits of local birding may have limited impact. Messaging should instead combine attitude-based appeals with social norms and PBC-based strategies to be most effective.

Implications

Subjective norms emerged as the strongest predictor of birders' intentions to stay local, followed very closely by perceived behavioral control. While attitude was also a significant predictor the descriptive statistics revealed that Kansas birders already hold highly favorable attitudes toward local birding (average attitude score = 5.47 out of 7). This means the challenge is creating supportive social environments and making local birding easy, accessible, and rewarding. Managers should not waste resources on attitude-change campaigns, instead, they should focus on the social and practical barriers that prevent birders from acting on their already-positive beliefs.

Given that social norms were the strongest predictors of intentions, managers should leverage the social aspects of the birding community to influence behavior. Research has shown that subjective norms can have the greatest influence on behavioral intentions in birding contexts (Jafarpour & Ramkissoon, 2025). A messaging campaign that KDWP and organization like Cornell could use to control long-distance birding behavior is the message "*The most ethical birding is often the birding closest to home".* Since birdwatchers will feel high social pressure from their peers and KDWP when that pressure is presented, a message of what KDWP wants

people to do will be most effective to leverage these findings. Even though we didn't ask about ABA or Cornell subjective norms, these organizations could be promising outlets for increased social pressure alongside KDWP. When alerts of rare bird alerts do pop up from Cornell, they could pair these with messages along the lines of "*Before you drive 4 hours, consider checking your local patch first."* This type of messaging could keep people mindful about what type of birds they might see in their local area.

If birdwatchers strive to perform a more in-depth study of their local area, they can run into an effect that we call the "Patagonia Picnic Table Effect". This is a social feedback loop where rarity discoveries are presumed to lead to additional rarity discoveries because of the elevated levels of birder activity once an initial rarity is reported (Laney, J. A, 2021). This is a phenomenon that is not only possible with long-distance birding, but can also be achieved in birdwatchers local areas. If KDWP and Cornell are applying pressure to encourage people to bird locally, then this can lead to increased sightings of rare birds in peoples local area, giving people similar satisfaction they can receive from long distance birding. KDWP can also encourage this behavior to take place by hosting local events and or patch challenges in which prizes or recognition is given to birder who find rare birds locally. We know that this can work as previous research has shown us that social aspects as the most important predictors of participation in birding events (Callaghan, C. T., 2025).

Limitations and Recommendations for Future Work

This research provides valuable information to improve understanding of Kansas birders' intentions to engage in local versus long-distance birding and extends previous TPB research on recreational behavior in a new context. A number of limitations and future research directions are recommended. Study participants were made up of individuals who received surveys through the

KDWP listserv and affiliated organizations, so the perceptions of those who are not in this group were not represented. Future studies should seek to replicate this work with a broader sample of Kansas birders. Intercept surveys of actual birders at state parks and wildlife areas would capture perceptions, attitudes, behavioral intentions, and reported behaviors on site rather than after the fact through an online survey.

Although the results inform the prediction of behavioral intentions, they may not transfer to the reality of birding. The TPB posits that intention is the strongest predictor of behavior, but the model explains only 22% of the variance in intention which leaves 78% unexplained, and the gap between stated intention and actual on-the-ground behavior remains untested in this study. The unexplained variance likely includes factors that are not captured in the model, such as habit, spontaneous rare bird alerts on eBird or social media that trigger impulsive travel decisions, weather and seasonal conditions, gas prices and travel costs, emotional attachment to specific birding sites, and the sheer excitement of the birding that may override deliberative decision-making. The findings are generalizable to the extent that they describe the psychological origin of intention, but they cannot be generalized to actual birding behavior without further validation. Future studies should assess actual birding behavior following experimental design methodologies where birders are exposed to influential messaging treatments. For example, given that birders cannot necessarily change their travel behavior after exposure to messaging at the trailhead, treatment messages could be tested during the planning phase when people are preparing for their birding trips. Research has demonstrated that TPB provides a robust framework for developing and evaluating interpretive communication strategies in parks and protected areas. For example, Lackey and Ham (2003) applied the TPB to examine how Yosemite National Park's interpretive services could improve communication about human-bear

conflicts and food storage behavior among overnight users, identifying salient beliefs that underpin future communication intervention strategies. Similarly, Miller (2019) used the TPB to develop belief-based communication for day hikers regarding bear spray use in Yellowstone National Park. Reigner and Lawson (2009) demonstrated the efficacy of TPB-based visitor education in Haleakalā National Park, finding that the framework effectively predicted behavioral intentions and informed management strategies. More broadly, studies have shown that indirect management approaches, including interpretive messaging informed by behavioral theory, can effectively mitigate visitor impacts in protected areas, such as reducing undesignated trail use (VanderWoude et al., 2018). This body of research highlights the value of applying the TPB to design and evaluate interpretive messaging that encourages sustainable recreation behaviors, which is the focus of the present study.

Furthermore, design-related issues might prohibit birders from choosing local birding unless the cost of travel and the potential for missing rare species becomes greater than the perceived hassle of staying local. Given that the majority of participants likely spend time preparing for their birding trips, messaging seen early in the planning process will likely be most effective. The study sample was comprised of Kansas recreationists and may not generalize to other populations or geographic contexts of interest (e.g., birders in other states, twitchers in the UK), and so additional studies in other contexts are warranted. Also, there may be perceptual and behavioral differences between birders in different regions of Kansas or between those who reside nearby specific birding hotspots (e.g., Cheyenne Bottoms, Quivira National Wildlife Refuge), and future research should examine if differences exist that may merit different interpretive messaging approaches.

Chapter 3 - A Research Note Demographic Profile Of Birdwatchers In The Sunflower State

Abstract

Birdwatching is a growing recreational activity with documented economic and conservation significance, yet Kansas-specific demographic profiles of birdwatchers remain limited. This Research Note provides a demographic analysis of 1,045 Kansas birdwatchers who completed a statewide survey. Results indicate that respondents were predominantly white, male, middle-aged to older adults, and relatively well-educated, with the average reporting household incomes between $100,000 and $149,999. Most respondents reported little difficulty meeting monthly bills, and household sizes were predominantly two-person. These findings establish a baseline profile of Kansas birdwatchers, suggest opportunities for broadening participation, and inform targeted outreach by recreation providers. Implications for sustainable birding practices and future research are discussed.

Introduction

Birdwatching is among the most popular outdoor recreation activities in the United States, engaging 96 million annually. Birdwatching continues to be a popular pastime and a significant economic force (U.S. Fish and Wildlife Service, 2024). Birdwatchers build lists of species encountered and organize those lists to track numbers of species encountered during their own lifetime, or a given year, and often travel long distances to encounter new or rare birds (Wood et al., 2011). Birders around the globe invest significant time and effort to observe rarities and add them to their personal lists, therefore, understanding who participates in birdwatching is valuable

for recreation providers, conservation agencies, and rural communities that depend on wildlife-related tourism.

Given its location, Kansas serves as an ideal spot for this investigation due to its position at the hub of North American migration corridors. In the west north central region of the country, there is around 7 million active birdwatchers every year (U.S. Fish and Wildlife Service, 2024). The Central and Mississippi Flyways are two of the major migration corridors funneling millions of birds between breeding grounds in the north and wintering grounds in the south each year. (Janzen & Gress, 2025; KSNT, 2025). Up to 800 million birds are forecasted to migrate through Kansas during peak seasons, taking advantage of critical stopover habitats like Cheyenne Bottoms and Quivira National Wildlife Refuge with a total of 486 unique avian species being documented in the state, (KSNT, 2025).

The economic impact of birding in Kansas is substantial. Birdwatchers contribute to the state economy through expenditures on travel, supplies, and lodging. The total impact of visitor expenditures of visitors at Cheyenne Bottoms is around $1.9 million a year (Kansas Institute for Policy and Social Research, 2023). These visitors support local businesses, including hotels, restaurants, and retail stores, particularly in rural communities near major birding hotspots (The Nature Conservancy, 2024). Audubon of Kansas hosts birding festivals such as the Celebration of Cranes and the Kansas Lek Treks Prairie-Chicken Festival, which draw participants from across the country (Audubon of Kansas, 2025). These existing initiatives demonstrate the importance of birding to Kansas and the potential for targeted management strategies to influence birding behavior.

Despite the documented economic importance of birding in Kansas, a comprehensive statewide demographic profile of Kansas birders is lacking. While national level demographic profiles exist

(U.S. Fish and Wildlife Service, 2024) and regional studies have examined birdwatcher characteristics in other states, no recent study has systematically described who participates in birding in Kansas. Recreation providers cannot effectively design outreach, programming, or infrastructure without understanding the demographic composition of their current and potential users. Second, conservation agencies cannot assess whether their messaging resonates with the full diversity of Kansas residents without knowing who is and isn't participating in birding, and rural communities that depend on wildlife-related tourism need demographic information to plan for visitor services, marketing, and economic development. A statewide demographic profile provides the foundational data necessary for all of these planning efforts. Three questions guide this analysis:

1. What are the demographic characteristics of Kansas birdwatchers?
2. How do these characteristics compare to broader state and national patterns?

Literature Review

Birdwatching is one of the most popular and economically significant outdoor recreation activities in the United States. Approximately 96 million Americans participated in birdwatching in 2022, generating $279 billion in economic output and supporting 1.4 million jobs. This substantial economic contribution shows us the importance of understanding who participates in birding, both for recreation management and for communities that depend on wildlife-related tourism. Birdwatching encompasses a spectrum of behaviors, from casual backyard observation to specialized travel for rare species sightings (U.S. Fish and Wildlife Service, 2024), and this

diversity has significant implications for how recreation providers engage with different segments of the birdwatching population.

National Demographic Patterns

National surveys have consistently documented that birdwatchers are older, more educated, and more affluent than the general population. The U.S. Fish and Wildlife Service (2024) reports that the average birder is 49 years old, with participation increasing with age. Birders are also more likely to hold college degrees and to report higher household incomes than non-birders (Carver, 2011; Cordell & Herbert, 2002). These patterns align with broader wildlife recreation research demonstrating that participants in nonconsumptive wildlife activities tend to have higher educational attainment and greater financial resources than the general public.

Gender and Race

National data show that birdwatching participation is roughly balanced or slightly female-skewed, with women representing a substantial proportion of casual birders and men overrepresented among specialized birders (Randler, 2021; McFarlane, 1994). Racial and ethnic composition remains overwhelmingly white, with approximately 75% of birders identifying as white (U.S. Fish and Wildlife Service, 2024). Asian Americans have the highest participation rate at 47%, though they represent a small proportion of the overall birder population. This lack of diversity has been attributed to historical exclusionary practices and ongoing barriers to participation.

Regional Variation

Demographic profiles vary by region. Studies in the Upper Midwest, Texas, and the Pacific Northwest have documented distinct participation patterns shaped by local migration corridors,

land access policies, and cultural attitudes toward outdoor recreation (Wilkins et al., 2019). Kansas, as a Central Flyway state with extensive public wetlands and a strong agricultural economy, may attract a demographic profile distinct from coastal or mountainous states. However, no recent study has documented this profile.

Planning Applications

Demographic data are foundational for recreation planning. The Land and Water Conservation Fund (LWCF) requires states to develop Statewide Comprehensive Outdoor Recreation Plans (SCORPs) that assess outdoor recreation needs and prioritize funding accordingly. The SCORP serves as a planning tool that agencies use to identify gaps in recreation opportunities and allocate resources (Kansas Department of Wildlife and Parks, 2024). A statewide demographic profile of birders directly informs SCORP priorities by identifying which segments of the population are currently engaged, which are underrepresented, and where targeted outreach and infrastructure investments are needed.

Research Gaps

Despite the substantial body of research on birdwatcher demographics, motivations, and specialization, several gaps remain. First, while national-level demographic profiles exist, state-specific profiles for regions such as Kansas remain limited. Kansas's position along the Central Flyway, combined with its diverse landscapes ranging from tallgrass prairie to wetlands and reservoirs, creates unique birding opportunities that may attract a distinctive participant profile. Understanding who birds in Kansas is essential for effective recreation management and conservation outreach.

These gaps highlight the need for an examination of the demographic and psychological components that influence birding behavior in specific geographic contexts. The present study seeks to provide insights into the demographic profile of Kansas birdwatchers, establishing a baseline for future research on the psychological mechanisms that drive or constrain birding behavior and informing efforts to promote sustainable birdwatching practices. By documenting who participates in birding in Kansas, this Research Note contributes to the broader literature on recreation specialization and provides practical implications for recreation providers seeking to engage diverse audiences and promote sustainable practices.

Methods

Data used in this study were collected through surveys used to inform the Kansas Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2027-2037. The federal Land and Water Conservation Fund (LWCF) program requires a SCORP from each state prior to receiving LWCF financial assistance for the acquisition and development of outdoor recreation resources. A SCORP is designed to assess the outdoor recreation needs of a state's residents and visitors, including specific user groups such as birders, to ensure that LWCF funded projects reflect the priorities of the public. The SCORP serves as a planning tool that agencies use to identify gaps in recreation opportunities and allocate resources accordingly. The survey instrument was developed with input from the Kansas Department of Wildlife and Parks. The questions were designed to understand what outdoor recreation activities people currently participate in (and how often), what they would like to see more of, at what types of places do they recreate and what barriers there may be to their participation.

The newest SCORP for Kansas used a Recreation User Survey to receive data from people who recreate in Kansas natural and municipal spaces, which allows us a broad range of recreationists

to survey for this study. The primary data collection effort took place via online survey (i.e. Qualtrics) during the first six months of 2026 after approval was gained from IRB (13067). A database of email addresses from 251,390 Kansas outdoor recreation users were acquired from KDWP. In all cases, the potential survey participant was 18 years of age or older. An overall response rate of 5.99% (15,058 surveys) was obtained, which is within accepted standards (Vaske, 2008). From this sample of Kansas recreationists, 1,045 responses self identified as birdwatchers of wildlife viewers, and those are the responses used for this demographic study. An initial email was sent to all valid participants, and then two successive reminders (one week apart for both) were sent to those who had not already completed the survey. Summary statistics were conducted to measure percentages, mean values, and standard deviations for all questions.

Results

Table 6 Sample Characteristics of Respondents

Variables	Categories	Frequency*	Percentage (%)*
Gender	Male	641	58
	Female	442	40
	Other	1	0.1
Age	70	53	4.8
	68	46	4.2
	67	45	4.1
Household Size	1	133	12
	2	636	57.5
	3	150	13.6
Education	Bachelor's degree	359	32.5
	Graduate or Professional Degree	307	27.8
	Some college, no degree	147	13.3
Personal Income - Yearly	$100,000-125,000	173	15.6
	$80,000-99,000	140	12.7
	$65,000-79,000	121	10.9

Age

Respondents represented a wide age range, with birth years spanning from 1939 to 2010. The largest cohorts were born in the 1950s and 1960s, with 1956 (4.8%), 1958 (4.2%), 1959 (4.1%), and 1961 (4.1%) representing the most frequently reported birth years. This suggests that the typical Kansas birdwatcher in this sample is middle-aged to older, consistent with national patterns showing that birdwatching participation increases with age (U.S. Fish and Wildlife Service, 2024).

Gender

The sample was 58% male, 40% female, 0.1% other, and 2% preferred not to answer. The male bias is notable, as national wildlife viewing data often show more balanced or female-skewed participation (U.S. Fish and Wildlife Service, 2024).. This finding may reflect the broader outdoor recreation survey from which the birdwatcher subsample was drawn, or it may indicate that male birdwatchers in Kansas are more likely to respond to recreation surveys.

Race and Ethnicity

The sample was overwhelmingly white (90.3%). Smaller proportions identified as Hispanic or Latino (0.7%), American Indian or Alaska Native (1.4%), African American (0.4%), Asian American (0.3%), or Native Hawaiian (0.1%). About 4.2% preferred not to answer, and 1% selected multiple or other categories. These results indicate a significant lack of racial and ethnic diversity among respondents, which differs from national trends, in which Asian Americans are the most likely to participate in birdwatching (U.S. Fish and Wildlife Service, 2024).

Education

Respondents were highly educated. The largest group held a bachelor's degree (20.7%), followed by graduate or professional degrees (16.5%), some college with no degree (9.6%), high school diploma or GED (7.0%), and associate degrees (6.3%). An additional 5.7% held trade or vocational certificates. Only 0.3% reported some high school with no degree.

Household Income

Income distribution was broad but skewed toward higher brackets. The largest group reported household incomes between $100,000 and $149,999 (32.5%), followed by $150,000 to $199,999 (27.8%), $75,000 to $99,999 (12.7%), and $50,000 to $74,999 (10.9%). Smaller proportions reported incomes below $50,000 (approximately 5.8% combined) or above $200,000 (7.6%). About 11.9% preferred not to answer.

Household Size

Most respondents lived in two-person households (57.0%), followed by three-person (12.5%), four-person (11.5%), and one-person (10.7%) households. Larger households of five or more people accounted for less than 10% of the sample.

Financial Well-Being

Respondents generally reported low financial strain. More than half (56.2%) said meeting monthly bill payments was "not difficult at all," while 26.8% reported slight difficulty, 11.9% moderate difficulty, 2.8% very difficult, and 2.0% extreme difficulty. These results align with the income data and suggest that most respondents have the financial capacity to participate in birdwatching and related travel.

Discussion

The demographic profile that emerges from this analysis is one of a relatively homogeneous, affluent, well-educated, and older population of Kansas birdwatchers. This profile is consistent with national research on wildlife viewing and birdwatching, which has long documented overrepresentation of white, college-educated, middle-to-upper-income adults (U.S. Fish and Wildlife Service, 2024). However, the Kansas data also reveal some distinctive patterns, including a male bias and a concentration of respondents in two-person households, which may reflect the broader outdoor recreation survey context.

The findings from a statewide demographic profile are important to several groups of people for multiple reasons. First, it provides recreation providers with the foundational data needed to design outreach, programming, and infrastructure that meets the needs of current users and attracts new ones. The finding that Kansas birders are predominantly white (90.3%) and older suggests that current outreach efforts may not be reaching younger, more racially diverse audiences. Recreation providers can use this information to develop targeted programming including bilingual events, community partnerships, and youth engagement initiatives that broaden participation and ensure that birding reflects the diversity of Kansas communities.

Second, a demographic profile informs conservation planning and messaging. The finding that Kansas birders are highly educated and relatively affluent suggests that current participants have the resources to travel and invest in equipment, which may reinforce long-distance birding patterns. Promoting local and sustainable birding practices may require framing that appeals to this group's existing values, such as conservation and stewardship, rather than assuming that cost or access are primary barriers.

Third, a demographic profile supports the SCORP planning process by identifying which segments of the population are currently engaged and which are underrepresented. This

information allows KDWP and its partners to allocate resources strategically, prioritizing outreach to underrepresented groups and ensuring that LWCF-funded projects reflect the priorities of the public.

The primary beneficiaries are recreation providers, conservation agencies, and rural communities that depend on wildlife-related tourism. KDWP can use this profile to inform SCORP priorities, design targeted outreach, and assess whether current programming reaches the full diversity of Kansas residents. The American Birding Association and the Cornell Lab of Ornithology can use this profile to tailor their messaging and programming to Kansas audiences. Rural communities near major birding hotspots can use this information to plan for visitor services, marketing, and economic development. Finally, researchers can use this baseline profile to track demographic changes over time and to compare Kansas birders to birders in other states.

Limitations and Future Work

The sample is self-selected and drawn from a KDWP email database, meaning it may overrepresent individuals who are already engaged with the agency. The race and ethnicity categories were collapsed due to small cell sizes, limiting fine details. Income and education categories were broad, and some respondents selected "prefer not to answer," reducing effective sample sizes for those items. Finally, the survey captured birdwatchers at a single point in time, which is not conducive for an analysis of demographic change over time.

Future research should build on this baseline profile in several ways. Intercept surveys at birding hotspots such as Cheyenne Bottoms and Quivira National Wildlife Refuge would capture the demographics of birders who are actively birding on-site, complementing the online survey data. A comparative study across Central Flyway states would allow researchers to assess whether the

Kansas profile is distinctive or reflects broader regional patterns. Future research should also examine how demographics intersect with specialization, motivation, and place attachment to provide a more complete understanding of Kansas birders.

References

Aas, Ø., Jørgensen, F. M. O., Stensland, S., Reiertsen, T. K., & Dybsand, H. N. H. (2023). Your place or mine? Exploring birdwatching tourists' behaviour disturbing birds in a nature reserve. *European Journal of Wildlife Research, 69*(3), 1.

Ajzen, I., & Driver, B. L. (1992). Application of the Theory of Planned Behavior to Leisure Choice. Journal of Leisure Research, 24(3), 207-224.

Audubon of Kansas. (2025). *Birding festivals and events*.

Booth, J. E., Gaston, K. J., Evans, K. L., & Armsworth, P. R. (2011). The value of species rarity in biodiversity recreation: A birdwatching example. Biological Conservation, 144(11), 2728-2732.

Brock, M., Fraser, I., Law, C., Mitchell, S., & Roberts, D. L. (2020). An Economic Analysis of Twitching Behaviour and Species Rarity. Journal of Environmental Economics and Policy.

Callaghan, C. T., Benson, I., Major, R. E., Martin, J. M., Longdon, T., & Kingsford, R. T. (2019). Birds are Valuable: The Case of Vagrants. Journal of Ecotourism, 19(1), 82-92.

Callaghan, C. T., Slater, M., Major, R. E., Morrison, M., Martin, J. M., & Kingsford, R. T. (2018). Travelling birds generate eco-travellers: The economic potential of vagrant birdwatching. Human Dimensions of Wildlife, 23(1), 71-82.

Carter, M. (2006). Cocos (Keeling) Islands trip report. Wingspan, 16(4), 3-9.

Carver E. 2011. Birding in the United States: a demographic and economic analysis. Arlington: U.S. Fish and Wildlife Service, Division of Economics. Available at https:// digitalmedia.fws.gov/ digital/ collection/ document/ id/ 1874/ Report No.: 2011-1

Cheung, L. T. O., Lo, A. Y., & Fok, L. (2017). Recreational specialization and ecologically responsible behaviour of Chinese birdwatchers in Hong Kong. *Journal of Sustainable Tourism, 25*(6), 817–831.

Cocker, M. (2001). Birders: Tales of a tribe. Jonathan Cape.

Connell, J. (2009). Birdwatching, twitching and tourism: Towards an Australian perspective. Australian Geographer, 40(2), 203-217.

Cordell H, Herbert N. 2002. The popularity of birding is still growing. Birding. Available at https:// www.srs.fs.usda.gov/ pubs/ ja/ ja_cordell002.pdf

Dooley, S. (2005). The big twitch. Allen & Unwin.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, 18(1), 39-50.

Glowinski, S. L., & Moore, F. R. (2014). The role of recreational motivation in the birding participation–environmental concern relationship. *Human Dimensions of Wildlife, 19*(3), 219–233.

Jafarpour, M., & Ramkissoon, H. (2025). A new cognitive conservation model for understanding Malaysian birders' behaviour towards birds. *Journal of Ecotourism, 24*(2), 172-195.

Josefsson, J., Pärt, T., Berg, Å., & Eggers, S. (2017). Effects of a coordinated farmland bird conservation project on farmers' intentions to implement nature conservation practices: Evidence from the Swedish Volunteer & Farmer Alliance. *Journal of Environmental Management, 187*, 8-15.

Kline, R. B. (2023). Principles and practice of structural equation modeling. Guilford publications.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research, 8(3), 239-260.

Kronenberg, J. (2014). Environmental Impacts of the Use of Ecosystem Services: Case Study of Birdwatching. Environmental Management, 54, 617-630.

Laney, J. A., Hallman, T. A., Curtis, J. R., & Robinson, W. D. (2021). The influence of rare birds on observer effort and subsequent rarity discovery in the American birdwatching community. *PeerJ*, *9*, e10713. https://doi.org/10.7717/peerj.10713

Lee, J. H., & Scott, D. (2004). Measuring birding specialization: A confirmatory factor analysis. Leisure Sciences, 26(3), 245-260.

Liep, J. (2001). Airborne kula: The appropriation of birds by Danish ornithologists. Anthropology Today, 17(5), 10-15.

Martin, S. R., & McCurdy, K. (2009). Wilderness food storage in Yosemite: Using the theory of planned Behavior to understand backpacker canister use. *Human Dimensions of Wildlife*, *14*(3), 206–218. https://doi.org/10.1080/10871200902858993

McFarlane BL. 1994. Specialization and motivations of birdwatchers. Wildlife Society Bulletin (1973–2006) 22(3):361–370.

McFarlane, B. L. (1994). Specialization and motivations of birdwatchers. Wildlife Society Bulletin, 22(3), 361-370.

Miller, Z. D., Freimund, W., Metcalf, E. C., Nickerson, N., & Powell, R. B. (2019). Merging elaboration and the theory of planned behavior to understand bear spray behavior of day hikers in Yellowstone National Park. *Environmental Management*, *63*(3), 366–378. https://doi.org/10.1007/s00267-019-01139-w

Moss, S. (2004). A bird in the bush: A social history of birdwatching. Aurum.

Oddie, B. (1995). Bill Oddie's little black bird book (2nd edition). Robson.

Randler, C. (2021). An analysis of heterogeneity in German speaking birdwatchers reveals three distinct clusters and gender differences. *Birds*, *2*(3), 250–260.

Randler, C., & Großmann, N. (2022). Birder's characteristics for participation in a big day—social aspects are more important than competition. Current Research in Ecological and Social Psychology, 3, 100050.

Reigner, N., & Lawson, S. R. (2009). Improving the Efficacy of Visitor Education in Haleakalā National Park Using the Theory of Planned Behavior. *Journal of Interpretation Research*, *14*(2), 21-45.

Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. Journal of Statistical Software, 48(2), 1–36. https://doi.org/10.18637/jss.v048.i02.

Rossi, A. N., & Armstrong, J. B. (1999). Theory of reasoned action vs. theory of planned behavior: Testing the suitability and sufficiency of a popular behavior model using hunting intentions. Human Dimensions of Wildlife, 4(3), 40–56. https://doi.org/10.1080/10871209909359156

Scott, D., Ditton, R., Stoll, J., & Eubanks, T. (2005). Measuring specialization among birders: Utility of a self-classification measure. Human Dimensions of Wildlife, 10(1), 53-74.

Sekercioglu, C. H. (2002). Impacts of birdwatching on human and avian communities. Environmental Conservation, 29(3), 282-289.

Sheard, K. (1999). A twitch in time saves nine: Birdwatching, sport, and civilizing processes. Sociology of Sport Journal, 16(3), 181-205.

Stern, M. J. (2018). Theories of motivation, cognition, and reasoning. In W. J. Sutherland (Ed.), Social science theory for environmental sustainability: A practical guide (pp. 26–62). Oxford.

Steven, R., Morrison, C., & Castley, J. G. (2015). Birdwatching and avitourism: A global review of research into its participant markets, distribution and impacts, highlighting future research priorities to inform sustainable avitourism management. Journal of Sustainable Tourism, 23(8-9), 1257-1276.

Sullivan BL, Wood CL, Iliff MJ, Bonney RE, Fink D, Kelling S. 2009. eBird: a citizenbased bird observation network in the biological sciences. Biological Conservation 142:2282–2292 DOI 10.1016/j.biocon.2009.05.006.

Vaske, J. J. (2008). *Survey research and analysis: Applications in parks, recreation and human dimensions*. Venture Publishing.

Wilkins, E. J., Cole, N. W., Miller, H. M., Schuster, R. M., Dayer, A. A., Duberstein, J. N., ... & Raedeke, A. H. (2019). Rural-urban differences in hunting and birdwatching attitudes and participation intent. *Human Dimensions of Wildlife, 24*(6), 530-547.

U.S. Fish and Wildlife Service. 2016. 2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. 2018 Oct. Report No.: FHW/16-NAT(RV). Arlington: U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. Department of Commerce, U.S. Census Bureau.