

THE ECONOMIC IMPACT OF THE ANNUAL CRANE MIGRATION ON CENTRAL NEBRASKA 2017

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The Economic Impact of the Annual Crane Migration on Central Nebraska

Executive Summary

Ecotourism is an emerging opportunity for Nebraska's tourism industry. One particularly important ecotourism event in Nebraska is the Sandhill Crane Migration. Each spring more than 600 thousand Sandhill Cranes stop along Nebraska's Platte River valley to rest and refuel before flying further north to breeding grounds. Because of the cranes, organizations devoted to crane preservation, education, and watching exist and bring new money to the Central Nebraska economy by attracting donations and grants to support these efforts. Also, the cranes attract tourists to the area who spend money in hotels, restaurants, and other businesses, and this new spending supports output, employment, and wages in the regional economy.

This study estimates the annual economic and tax revenue impact of the 2017 Sandhill Crane Migration on Central Nebraska. We consider the spending of two groups: 1) the annual expenditures and employment of organizations devoted to crane preservation, education, and watching, and 2) off-site visitor spending from visitors attracted to the Central Nebraska region by the crane viewing opportunity. To do so, we relied on financial reports and other data for the past fiscal year that are maintained by Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center, and we administered surveys to crane visitors to measure their spending. We used IMPLAN software to calculate the relevant economic multipliers.

We estimate that 46,500 crane visitors can be accounted for in Central Nebraska during the 2017 Migration, and of these, 93% or approximately 43,300 are non-Central Nebraska crane visitors. We find that the economic and tax revenue impacts of the crane organizations and visitors make a significant contribution to the Central Nebraska economy. Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center had a total economic impact of \$3.72 million and 46 full-time equivalent jobs on the Central Nebraska economy. Non-Central Nebraska crane visitor had a total economic impact of \$10.58 million and 136 jobs. Together, the overall economic impact of the Annual Crane Migration on Central Nebraska was \$14.30 million in 2017, supporting 182 year-round equivalent jobs. Moreover, given economic activity is taxed by local government, we estimate that this economic impact generates \$379,000 per year in local property, sales, and lodging tax revenue.

Overall, tourism activity in Central Nebraska due to the Annual Crane Migration has grown over time. Since the 2009 Migration, more crane visitors are coming solely for the migration rather than for other reasons and the crane visitors are more likely to extend their trip for one or more days to view the cranes.

Table of Contents

Executive Summary.....	i
List of Figures and Tables.....	iii
Acknowledgements	iv
I. INTRODUCTION	1
II. PREVIOUS STUDIES	1
III. METHODOLOGY.....	4
A. Study Area	4
B. Economic Impact Methods	4
C. Tax Revenue Impact Methods	6
IV. DATA.....	7
A. Spending by Organizations Devoted to Crane Preservation and Watching ...	7
B. Spending by Non-Central Nebraska Crane Visitors	8
1. Survey Administration	8
2. Survey Results: Crane Visitor Characteristics	9
3. Survey Results: Crane Visitor Estimates, Length of Stay & Spending.....	11
V. ECONOMIC & TAX REVENUE IMPACT RESULTS	15
A. Economic Impact Results	15
B. Tax Revenue Impact Results	18
VI. CONCLUSIONS	19
REFERENCES.....	21
APPENDIX A: CRANE VISITOR SURVEY.....	22

List of Figures and Tables

Table 1: Summary of Previous Economic Impact Studies	3
Figure 1: Approach for Calculating the Economic Impact of the Sandhill Crane Migration	5
Table 2: Days, Time, & Locations of Survey Work	9
Table 3: Respondents by Area & Previous Visitors	10
Table 4: Reason for Visiting Central Nebraska	10
Table 5: Extended Trip to Central Nebraska to Visit Cranes	11
Figure 2: Vehicle Counts on Platte River Road in Hall County	13
Figure 3: Vehicle Counts on 17th Road in Buffalo County	13
Table 6: Non-Central Nebraska Crane Visitor Length of Stay	14
Table 7: Non-Central Nebraska Crane Visitor Spending	15
Table 8: Annual Economic Impact	17
Table 9: Annual Local Tax Revenue Impact	19

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I. INTRODUCTION

Tourism is Nebraska's third largest revenue source and it is estimated that visitors spend more than \$4.5 billion on travel in the state (Nebraska Tourism Commission 2015). Ecotourism is an emerging opportunity for Nebraska's tourism industry. Real in-state expenditures by U.S. wildlife watchers have more than tripled since 2001, and bird watching alone attracts nearly 145 thousand Nebraska residents and nonresidents 16 years old and older to take trips away from home (U.S. Department of the Interior, et al. 2013). One particularly important ecotourism event in Nebraska is the Sandhill Crane Migration. Each spring more than 600 thousand Sandhill Cranes stop along Nebraska's Platte River valley to rest and refuel before flying further north to breeding grounds. Past studies estimate more than 70,000 people are attracted to Central Nebraska for the Migration, and that the 2009 Migration contributed \$10.33 million to Central Nebraska's economy (Lingle 1992, Fermata Inc. 1998, Edwards and Thompson 2009).

The purpose of this study is to provide an updated estimate of the annual economic and tax revenue impact of the Annual Crane Migration on Central Nebraska, a 13-county region along the Platte River from North Platte to Grand Island, Nebraska. Similar to past studies, we examine expenditures of organizations devoted to crane preservation, education, and watching, and we survey visitors who were attracted to the Central Nebraska region by the crane viewing opportunity to estimate off-site visitor spending. Our study contributions to the research on this topic by also surveying visitors at roadside locations. This, along with multisite visitation information, allows us to estimate the percentage of total crane visitors who are roadside-only visitors. This will be important for estimating future crane visitor counts as attendance figures from the organizations can be more accurately adjusted for roadside-only crane visitors.

II. PREVIOUS STUDIES

Previous studies that have estimated the economic impact of the Sandhill Crane Migration on Central Nebraska have done so, on average, every eight years (Lingle 1992, Fermata Inc. 1998, Edwards and Thompson 2009). The estimated economic impact of these

studies ranges from \$11.56 to \$47.6 million (in \$2016). The variation in the estimates are due to differences in the study area considered and methods used. Fermata Inc. (1998) considers a broad study area that ranges along the Platte and North Platte Rivers from North Platte to Columbus, Nebraska, and focuses more generally on birders and other wildlife watchers rather than solely on crane visitors. Lingle (1992) and Fermata Inc. (1998) apply overall local-area multipliers, whereas Edwards and Thompson (2009) use the IMPLAN modeling software to calculate economic multipliers for their 12-county study area. The latter estimation method is far more robust than the earlier studies in that the IMPLAN model is built directly from the region specific Social Accounting Matrices, and thus, reflects the region's unique structure and trade situation.

Although all three studies administer surveys to gather trip information on the visitors to the Central Nebraska region, the information varies across studies, particularly the average length of stay (1.31 days to 7.04 days) and the average visitor spending per day (\$53.06 to \$121.58 in \$2016).

Another important aspect of estimating economic impacts is identifying the total population of crane visitors. This is difficult because unlike hunters and anglers, licenses are not required to view cranes, and thus, visitor counts are necessary. Lingle (1992) relied on vehicle counts whereas Fermata Inc. (1998) and Edwards and Thompson (2009) relied on visitor counts, as well as, Lingle's estimate. Across the three studies, more than 70,000 crane visitors were estimated to visit the crane centers in the area, and also included roadsides/non-crane centers. Table 1 summarizes various aspects of the three studies.

Overall, the primary limitations of Lingel (1992) and Fermata Inc. (1998) are the estimated number of crane visitors based on vehicle counts and the calculated average length of stay (see Edwards and Thompson 2010) for a thorough critique of these studies). Given these are overestimates of the actual number of crane visitors and average days in the area, their estimated economic impacts are also likely overestimated.

Table 1: Summary of Previous Economic Impact Studies

Year	Author(s)	Geographic Area	Methods	Estimated Visitors	Average Length of Stay	Visitor Spending per day	Estimated Economic Impact
1992	Lingle, Gary R.	Platte and North Platte River area between Lexington and Grand Island, Nebraska	Vehicle counters Questionnaires Tabulation of visitor lists Local-area multiplier of 1.8	80,000	2.7 days	\$69.23 (\$121.00 in \$2016)	\$27 million (\$47.6 million in \$2016)
1998	Fermata Consulting Firm	Middle Platte River area between Columbus and North Platte, Nebraska	Surveys Visitor counts Local multiplier of 1.9	14,500 to 22,715 crane center visitors 60,000 day-tripper	7.04 days 1 day	\$79.48 (\$121.58 in \$2016) \$28.90 (\$44.21 in \$2016)	\$18.7 to 27.4 million (\$28.6 to 42.0 million in \$2016)
2009	Edwards, Richard & Eric Thompson	12 county Nebraska region: Custer, Sherman, Howard, Merrick, Dawson, Buffalo, Hall, Hamilton, Phelps, Kearney, Adams, and Clay	Financial reports Visitor counts Surveys IMPLAN	24,090 crane center visitors 49,710 non-crane center visitors	1.31 days 1.35 days	\$52.45 (\$58.68 in \$2016) \$47.43 (\$53.06 in \$2016)	\$10.33 million (\$11.56 million in \$2016) Note: includes crane center operations and visitors

III. METHODOLOGY

A. Study Area

The Central Nebraska study area includes a 13-county region along the Platte River from North Platte to Grand Island, Nebraska. The counties include Adams, Buffalo, Clay, Custer, Dawson, Hall, Hamilton, Howard, Kearney, Lincoln, Merrick, Phelps, and Sherman.

B. Economic Impact Methods

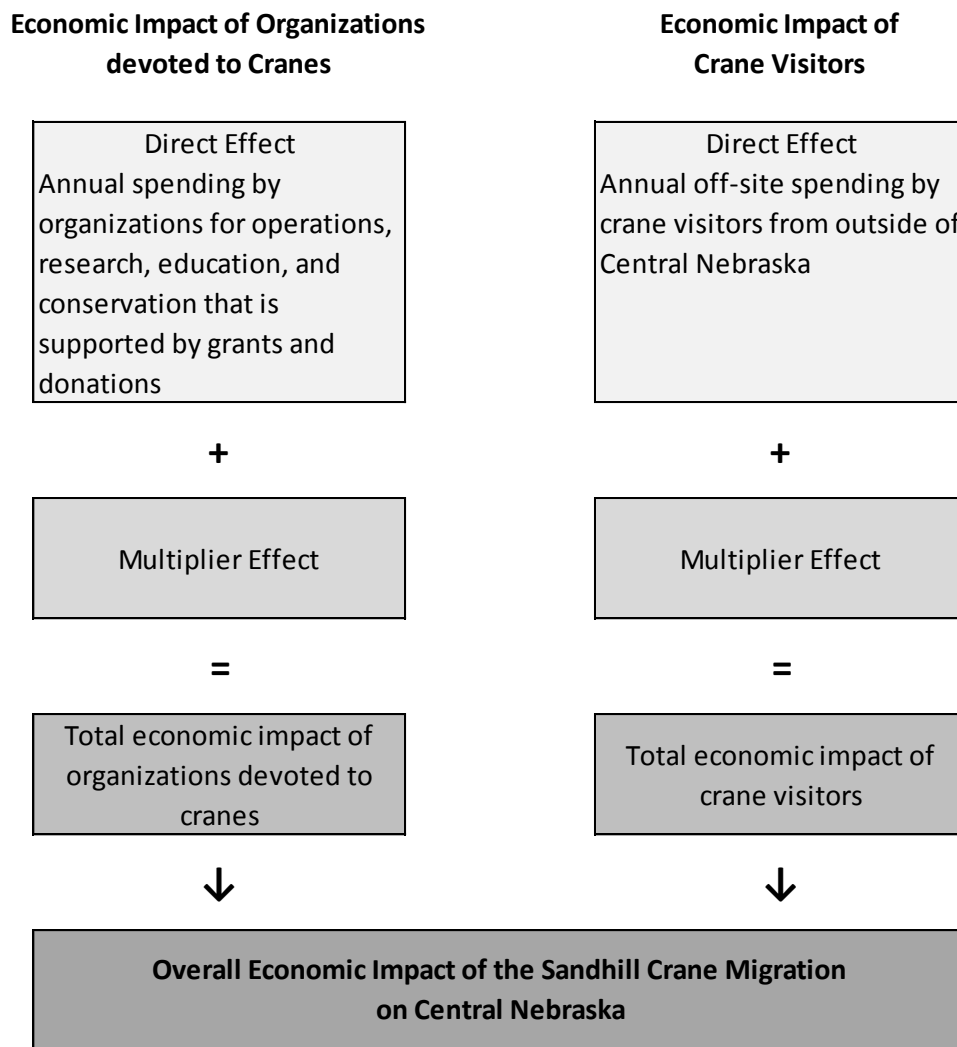
Figure 1 shows the approach used to estimate the economic impact of the Annual Crane Migration on Central Nebraska. The estimation involves examining the economic impact from the operation expenditures of organizations devoted to crane preservation, education, and watching (left side of Figure 1), and by crane visitors attracted to the Central Nebraska region by the crane viewing opportunity (right side of Figure 1). Specifically, a positive impact occurs when the organizations bring new money to the Central Nebraska economy by attracting donations and grants to support operations, research, education, and conservation activities and when it attracts tourists to the area who spend money in hotels, restaurants, and other businesses. This new spending supports output, employment, and wages in the regional economy.

Beginning on the left side of Figure 1, the first step is to estimate how much new money is attracted to the region for the organizations' operations, research, and conservation. To do so, we relied on financial reports and other data for the past fiscal year that are maintained by the organizations. External demand for operations, research, education, and conservation activities is represented in large part by the donations and grants that outside individuals and organizations make to support the organizations. This external demand represents the "direct effect" on the Central Nebraska economy from the operational expenditures of the organizations.

Next, the multiplier effect occurs as the initial spending on operations, research, education, and conservation activities circulates further within the regional economy, creating additional sales and employment opportunities in other businesses. For example, there is a

multiplier effect when Audubon’s Rowe Sanctuary and Crane Trust Nature & Visitor Center purchase services from Central Nebraska companies such as accounting services, legal services, or supplies. There is also a multiplier effect when their employees spend their paychecks throughout the local economy on typical household expenditures such as food, health care, housing, insurance, apparel, and entertainment. Thus, the multiplier effect captures how businesses throughout the regional economy gain from the money attracted to Central Nebraska. Specifically, economic multipliers show the dollars of total impact for each dollar of direct impact.

Figure 1: Approach for Calculating the Economic Impact of the Sandhill Crane Migration



We used the IMPLAN (Impact Analysis for Planning) Pro modeling software developed by the Minnesota IMPLAN Group to calculate economic multipliers for the Central Nebraska region. The IMPLAN is widely utilized for economic impact analysis by federal government agencies, state and local governments, universities, and private businesses. IMPLAN modifies the U.S. Input-Output Accounts for local economies based on detailed economic data for counties, or combinations of counties, to produce a local Social Accounting Matrix.

Finally, the total economic impact of organizations devoted to crane preservation, education, and watching is the sum of the direct effect and the multiplier effect.

The right-hand side of Figure 1 illustrates how the economic impact is calculated for crane visitors. Crane visitors are typically “tourists” who travel to visit Central Nebraska for one day or more. Their off-site spending in restaurants, gift-shops, lodging, or other businesses in Central Nebraska represents an additional economic impact from the Annual Crane Migration. We first estimate annual off-site spending by crane visitors attracted into Central Nebraska as a measure of the direct effect. To do so, we relied on attendance counts at the organizations devoted to crane preservation, education, and watching to estimate the total number of visitors to the area, and we administered surveys to crane visitors to measure their spending (see Data section for details). The new spending by crane visitors represents a new demand on the Central Nebraska economy and is the direct effect of visitor spending on the economy.

Hereafter, the process is the same as the left side of Figure 1. There is a multiplier effect and the total economic impact of the crane visitors is the sum of the direct effect and multiplier effect.

The overall economic impact of the Annual Crane Migration is simply the sum of the two economic impacts. As indicated by Figure 1, a key issue in calculating the overall economic impact is to estimate accurately the direct effects – the operations spending and the off-site spending by tourists. The Data section provides details on how these were calculated.

C. Tax Revenue Impact Methods

The economic impact also yields an impact on local tax revenue in Central Nebraska. This local tax revenue impact includes property taxes, the local portion of sales taxes, and

lodging taxes. Estimates of the total economic impact are used to estimate these tax revenue impacts. For example, a portion of employees' household income is spending on either rental or owner-occupied housing. This spending pays for homes and apartments which are subject to property tax. Also, the spending by crane visitors on restaurants, retail, and other services is subject to the sales tax, and their spending on lodging is subject to lodging tax. Further, a portion of income due to the multiplier impact also is spent on goods and services subject to the sales tax. Local taxes are estimated based on local tax rates and statewide sales tax base to personal income ratios. The Economic & Tax Revenue Impact Results section provides details on how the local tax revenue is calculated.

IV. DATA

A. Spending by Organizations Devoted to Crane Preservation and Watching

The information and data related to the expenditures of organizations devoted to crane preservation and watching were provided by Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center, and represent the past fiscal year. Expenditure information from Fort Kearny State Park, Buffalo Bill Ranch State Historical Park, and Golden Spike Tower and Visitor Center were not included because they are multifaced recreation and tourist destinations that are not solely focused on cranes and the Platte River habitat.

Expenditures by Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center are categorized by three broad categories: payroll, other operating expenses, and capital outlays. Because we are interested in the portion of total expenditures that are spent locally, payroll expenditures exclude employees living outside the Central Nebraska study area and other operating expenses have been adjusted for the amount spent locally. Capital expenditures is local construction spending to upgrade and/or expand facilities and support habitat protection.

Overall, local expenditures by Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center in the past fiscal year totaled \$3.24 million.

B. Spending by Non-Central Nebraska Crane Visitors

1. Survey Administration

To estimate the off-site visitor spending from visitors attracted to the Central Nebraska region, we administered a survey to arriving groups at crane viewing venues and popular roadside sites. Surveyors approached a crane visitor group, introduced themselves and provided a brief description of the research, asked if one person from the group would be willing to participate, and if so, handed them a clipboard with the consent form, survey, and a pencil. Survey respondents were asked about 1) where they are from (country and zip code), 2) their typical daily spending on hotel/lodging, food and drinks, gasoline/fuel, shopping/gifts, other entertainment/recreation, and other spending in the Central Nebraska area, and 3) other trip information (e.g., days visiting the Central Nebraska area, reason for trip, and whether the trip was extended because of the Sandhill Crane Migration). The survey instrument is included in Appendix A. After the survey was completed, the crane visitor placed it in a receptacle at the crane viewing or roadside site to ensure the anonymity of all responses.

Surveys were distributed at the crane viewing venues and roadside sites on March 16, 17, 18, and 24. The crane viewing venues included: Crane Trust Nature & Visitor Center, Fort Kearny State Historical Park, Fort Kearny Hike/Bike Trail, Audubon's Rowe Sanctuary & Festival, Buffalo Bill Ranch State Historical Park, and Golden Spike Tower and Visitor Center. Roadside sites included: CPNRD Plautz Viewing Site, Rowe Pond, Platte River Bridge off the Minden exit, and Muskrat Run State Wildlife Management Area. A total of 978 visitor groups were approached and 860 completed the survey for an 88% response rate. In terms of surveys completed by location, 86% of the surveys were completed at the crane viewing venues and 14% were completed at the roadside sites. Table 2 shows the day, time, and locations where survey work occurred.

Table 2: Days, Time, & Locations of Survey Work

	Thursday, March 16 3-7pm	Friday March 17 7-11am	Friday March 17 12:45-1:15	Friday March 17 3-7pm	Saturday March 18 3-7pm	Thursday, March 24 10-2pm
Crane Viewing Venues						
Crane Trust Nature & Visitor Center	X			X	X	
Fort Kearny State Historical Park	X			X	X	
Fort Kearny Hike/Bike Trail	X			X	X	
Rowe Sanctuary Visitors Center & Festival	X	X	X	X	X	
Buffalo Bill Ranch State Historical Park						X
Golden Spike Tower and Visitor Center						X
Roadside sites						
CPNRD Plautz Viewing Site	X			X		
Rowe Pond	X			X	X	
Platte River Bridge off the Minden exit		X				
Muskrat Run State Wildlife Management Area						X

2. Survey Results: Crane Visitor Characteristics

Column A of Table 3 shows that 93% of crane visitors are from outside of the 13-county Central Nebraska region, with the majority (38%) coming from other counties in Nebraska. The top six states in which crane visitors (30%) come from are: Colorado, Iowa, Minnesota, Wisconsin, Illinois, and Kansas. The remaining visitors (26%) came from other states in the U.S. and foreign countries.

Overall, there were slightly more out-of-state crane visitors during the 2017 Sandhill Crane Migration than during the 2009 Sandhill Crane Migration (55% in 2017 vs. 47% in 2009), but similar amounts of foreign crane visitors (1% in both Migrations) (Edwards and Thompson 2009).

Column B of Table 3 shows that overall 46% of crane visitors were repeat visitors. The highest percentages of repeat crane visitors are from Nebraska – 82% from Central Nebraska and 59% from Other Nebraska. Outside of Nebraska, the state with the highest amount of repeat crane visitors is Kansas at 58%, followed by Colorado at 48%.

Table 3: Respondents by Area & Previous Visitors

Area	% of Respondents from Each Area	% of Respondents who had previously visited Migration
	[A]	[B]
Other Nebraska	38%	59%
Central Nebraska	7%	82%
Colorado	8%	48%
Iowa	7%	43%
Minnesota	6%	30%
Wisconsin	4%	33%
Illinois	3%	33%
Kansas	3%	58%
Other States	25%	23%
Other Countries	1%	43%
Overall	100%	46%

Source: UNK-UNL Research Survey

When asked how important the Sandhill Crane Migration was in deciding to come to Central Nebraska, 87% of crane visitors who lived outside Central Nebraska indicated it was the principal reason for coming (Table 4). Only 4% said it was not important at all and that they were coming to the area anyway. Compared to the 2009 Sandhill Crane Migration, more crane visitors came to Central Nebraska during the 2017 Migration solely because of the Migration (87% in 2017 vs. 62% in 2009) (Edwards and Thompson 2009).

Table 4: Reason for Visiting Central Nebraska

Reason for Coming to Central Nebraska	% Choosing Response	
	2017 Migration	2009 Migration ^a
It was principal reason for coming.	87%	62%
It was one of several reasons for coming.	8%	21%
It was mentioned in local visitor guides and looked interesting.	1%	10%
It was not important. I was coming anyway.	4%	9%

^aEdwards and Thompson (2009)

Source: UNK-UNL Research Survey

Moreover, in terms of altering their trip because of the Sandhill Crane Migration, 62% of the 2017 crane visitors who lived outside Central Nebraska extended the length of their trip by one or more days whereas only 5% of the 2009 crane visitors did likewise (Table 5).

Overall, tourism activity in Central Nebraska due to the Sandhill Crane Migration has grown over time. Since the 2009 Sandhill Crane Migration, more crane visitors are coming solely for the migration rather than for other reasons and the crane visitors are more likely to extend their trip for one or more days to view the cranes.

Table 5: Extended Trip to Central Nebraska to Visit Cranes

Extra Days in Central Nebraska to View Cranes	% Choosing Response	
	2017 Migration	2009 Migration ^a
0 days	38%	95%
1 day	22%	5%
2 days	22%	0%
More than 2 days	18%	0%

^aEdwards and Thompson (2009)

Source: UNK-UNL Research Survey

3. Survey Results: Crane Visitor Estimates, Length of Stay, & Spending

To estimate the number of crane visitors to crane viewing venues during the 2017 Migration, we use attendance figures provided by the crane viewing venues and survey results on the percentage of visitors who visited or planned to visit other crane viewing venues when in the area. That is, the multisite visitation percentages are used to avoid double-counting crane visitors.

To estimate the number of roadside crane visitors, we use our survey results on the percentage of roadside crane visitors who were also not visiting any of the crane viewing venues in the area. We found that only 1% of the roadside crane visitors solely visited the roadsides. Thus, while crane visitors enjoy viewing cranes from the roadsides, 99% of them also visit one or more of the crane viewing venues while in the area. This implies that in future migrations, reasonably accurate crane visitor estimates can be obtained via attendance figures provided by the crane viewing venues.

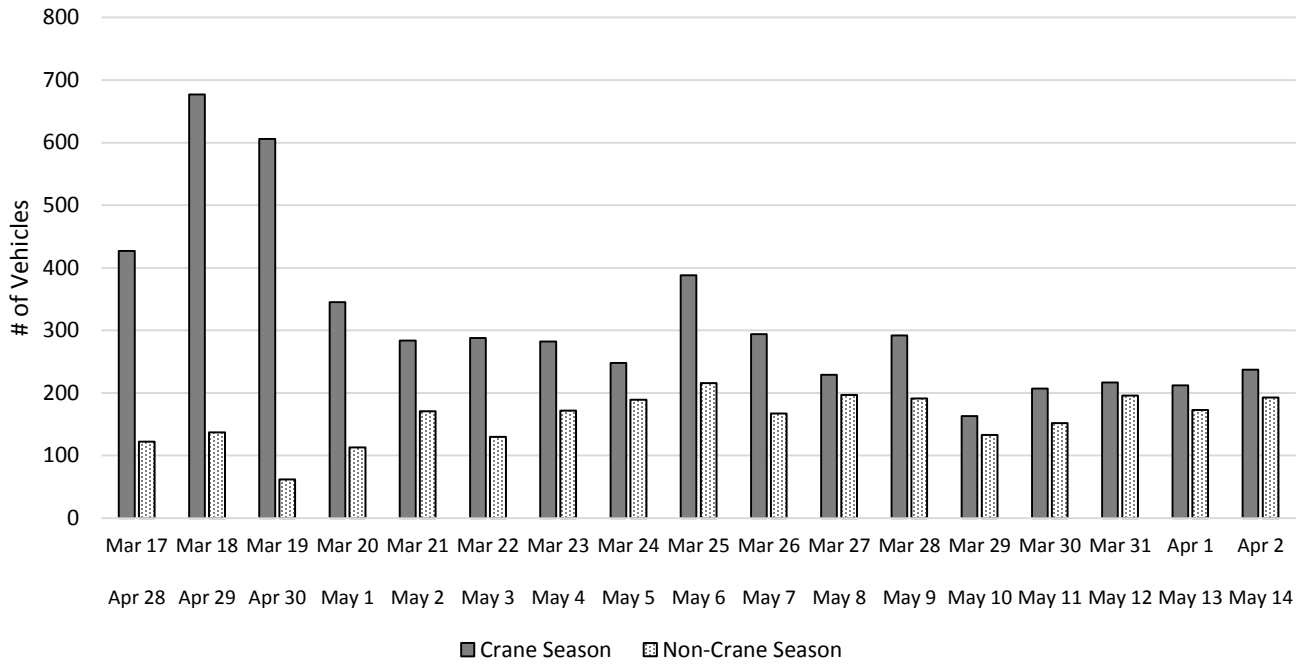
Given the attendance figures of the crane viewing venues and adjusting for multi-site visitation, as well as, the estimate of unique roadside visitors, approximately 46,500 crane visitors can be accounted for in Central Nebraska during the 2017 Migration. Of these, 93% or approximately 43,300 are non-Central Nebraska crane visitors.

In the spirit of Lingle (1992), we also put two vehicle counters out – one in Hall County and one in Buffalo County – during two 19-day periods – one during crane season and one outside of crane season – to corroborate our estimate of total crane visitors to the area. In Hall County, the vehicle counter was placed on the Platte River Road (a blacktop road) east of Alda/Juniata Road. A total of 5,565 vehicles were counted from 5:00 p.m. on Thursday, March 16 to noon on Monday, April 3 (e.g., during crane season) whereas 2,759 vehicles were counted from 5pm on Thursday, April 27 to noon on Monday, May 15 (e.g., during non-crane season). Figure 2 shows the daily vehicle counts during and outside of crane season. Traffic averaged 402 vehicles per day on weekends and 271 vehicles per day on weekdays during crane season and 158 and 161 vehicles per day on weekends and weekdays, respectively, during non-crane season.

In Buffalo County, the vehicle counter was placed on 17th Road (a gravel road) between Sioux and Sometown Roads. Figure 3 shows a total of 1,305 vehicles were counted from Thursday, March 16 to Monday, April 3 whereas 596 vehicles were counted from Thursday, April 27 to Monday, May 15 (daily counts are not available). Overall, the vehicle counts in both locations indicate that there are twice as many vehicles on the roads during crane season compared to during non-crane season. This highlights the limitation of Lingle's (1992) study, particularly his estimated number of crane visitors. He assumed that roughly 83% of the total vehicles were "bona fide" crane watchers. Our sample indicates that it is perhaps closer to 50%. If we use Lingle's (1992) method with this adjustment, 48,000 crane watchers would have been estimated to visit the area versus the 80,000 that he estimated.¹ Overall, this adjusted estimate of Lingle's is more consistent with our estimate that is based on multi-site visitation-adjusted attendance counts and our estimate of unique roadside visitors.

¹ The calculation is: 12,002 vehicles*50% (rather than 83%) = 6,001. He assumed 4 persons per vehicle yielding 24,004 crane watchers. He then doubled this to account for crane watchers who visited other crane-watching areas, yielding 48,008 crane watchers.

Figure 2: Vehicle Counts on Platte River Road in Hall County



Note: Only those dates with a 24-hour count are show. The top row of dates represents the crane season dates. The bottom row of dates represents the non-crane season dates.

Figure 3: Vehicle Counts on 17th Road in Buffalo County

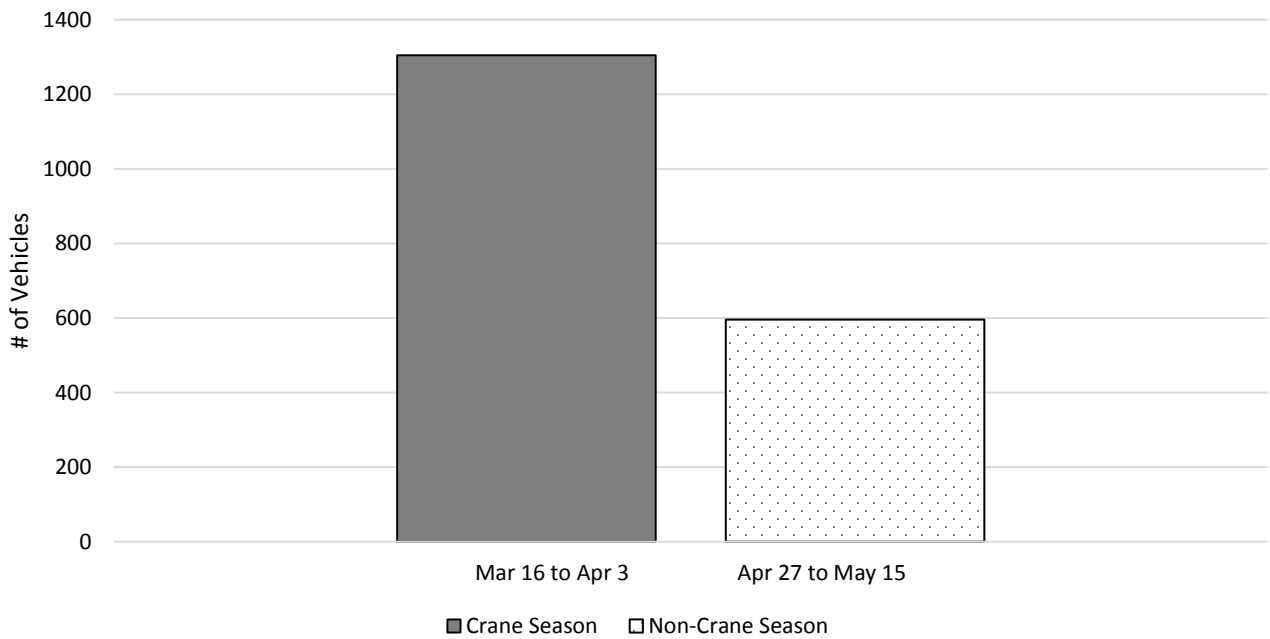


Table 6 shows that slightly more than one-quarter of the non-Central Nebraska crane visitors were day-trippers. And, the 87% of the non-Central Nebraska crane visitors who came solely for the Migration stayed an average of 3 days whereas the 8% who indicated the Migration was one of several reasons for coming stayed an average of 2.3 days. This information was used to obtain the weighted average length of stay of 2.7 days.² Compared to the 2009 Migration, the average length of stay of non-Central Nebraska crane visitors has increased by 1.4 days (Edwards and Thompson 2009). Overall, given there are about 43,300 non-Central Nebraska crane visitors who stay on average 2.7 days, the total number of visitor-days is 115,101.

Table 6: Non-Central Nebraska Crane Visitor Length of Stay

	Non-Central Nebraska Visitors
Estimated Crane Visitors	43,343
% Day-trippers	26%
Average length of stay (days)	
Given Migration was principal reason for coming	3.0
Given Migration was 1 of several reasons for coming	2.3
Importance of Migration for coming	
Principal reason (%)	87%
One of several reasons (%)	8%
Weighted average length of stay (days)	2.7
Total number of visitor-days	115,101

Source: UNK-UNL Research Survey

Column A of Table 7 shows average spending per non-Central Nebraska crane visitor per day in six spending categories. As expected, most of the daily spending was on hotel/lodging and food and drinks. In total, the average daily spending was \$93.37 per non-Central Nebraska crane visitor. This is about 60% more than the average daily spending found among crane

² To make this calculation, 87% of visitors were assigned a length of stay of 3 days and 8% of visitors were assigned a length of stay of 2.3/4 or 0.575 day.

visitors during the 2009 Migration (\$52.45 or \$58.68 after adjusting for inflation; Edwards and Thompson 2009).³

To calculate total spending by non-Central Nebraska crane visitors, each average spending category per visitor per day is multiplied by the total number of visitor-days. Column B of Table 7 show these amounts. Overall, the total amount spent by non-Central Nebraska crane visitors in 2017 was \$9.77 million.

Table 7: Non-Central Nebraska Crane Visitor Spending

Spending Category	Average Spending per Visitor per Day [A]	Estimated Total Spending (\$millions) [B]
Hotel/Lodging	\$32.43	\$2.76 ^a
Food and drinks	22.28	2.56
Gasoline/Fuel	15.13	1.74
Shopping	14.39	1.66
Entertainment	6.19	0.71
Other	2.96	0.34
Total	\$93.37	\$9.77

^aThe amount spent on hotel/lodging is based on the percentage of crane visitors who were not day-trippers.

Source: UNK-UNL Research Survey

V. ECONOMIC & TAX REVENUE IMPACT RESULTS

A. Economic Impact Results

The economic impact of the Annual Crane Migration on the 13-county Central Nebraska region ultimately depends on the visitor spending and the local expenditures of the Audubon’s Rowe Sanctuary and Crane Trust Nature & Visitor Center. Annual visitor spending was estimated to be \$9.77 million while the local expenditures of Audubon’s Rowe Sanctuary and Crane Trust Nature & Visitor Center in the past fiscal year totaled \$3.24 million. Of the \$3.24 million, approximately 35% represents capital expenditures and 65% represents spending on operations and employee compensation (wages, salaries, and benefits). Twenty-four full-time

³ A possible reason for the difference in average daily spending between the 2009 and 2017 Migrations is that the 2009 Migration was during Great Recession.

equivalent employees work in the study area for Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center. Also, expenditure figures include employee compensation for construction workers for capital expenditure projects, and workers at hotels, retail stores, service stations, entertainment venues and other businesses patronized by crane enthusiasts visiting the region.

The expenditures and employment described in the previous paragraph largely represent the direct impact of the crane migration on the Central Nebraska economy over the course of the year. One modification, however, is necessary for the case of visitor retail spending, for example on gasoline or clothing. In the case of spending on shopping or gasoline/fuel, only the "mark-up" portion of spending is a direct impact on the Central Nebraska economy. The "mark-up" portion of spending supports the operation of the local retail outlet whether it is a service station or a retail store. This is a direct impact on the regional economy. The rest of the cost of a retail item, for manufacturing and distribution, benefits businesses located around the country and the world. For example, gasoline is mined worldwide and refined in other parts of the country, while apparel is manufactured around the world. After adjusting to include only the retail mark-up, the direct annual economic impact of visitor spending falls from \$9.77 million to \$6.97 million.

Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center operations spending also involves some retail purchases, as well as, some land purchases for bird habitat. These land expenditures have potential to increase local spending over time, if the landowners live in the 13-county region. However, it is unlikely that landowners would spend much of the money from the sale immediately, as the land was part of their wealth portfolio. The purchases are noteworthy but do not contribute to the annual economic impact other than the amount spent for land appraisal. After adjusting for these two items, the direct annual economic impact of Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center operations spending falls from \$3.24 million to \$2.14 million.

The direct economic impacts are listed in Table 8 in terms of output (expenditures and spending), labor income (employee compensation and proprietor income), and employment. Each type of direct impact is reported for the two sources of economic impact: 1) center

operations and capital expenditure and 2) visitor spending. Note that labor income and employment are estimated for center capital expenditure and visitor spending. Estimates are generated utilizing the IMPLAN model. The IMPLAN model can be used to generate an estimate of the ratio of labor income per dollar of spending for capital expenditures (construction activity) and for each type of visitor spending for the 13-county Central Nebraska region. The IMPLAN model also can be used to estimate labor income per job for various industries in the 13-county region. These ratios are applied to expenditure totals in Table 8 to estimate the direct labor income and employment impact.

Table 8: Annual Economic Impact

Impact Category	Direct Impact [A]	Multiplier Impact [B]	Total Impact [C]
Center Operations and Capital Expenditure			
Output (Millions \$)	\$2.14	\$1.58	\$3.72
Labor Income (Millions \$)	\$1.54	\$0.46	\$2.01
Employment	34	13	46
Visitor Spending			
Output (Millions \$)	\$6.97	\$3.61	\$10.58
Labor Income (Millions \$)	\$2.21	\$1.04	\$3.25
Employment	108	28	136
Total			
Output (Millions \$)	\$9.11	\$5.19	\$14.30
Labor Income (Millions \$)	\$3.75	\$1.50	\$5.26
Employment	141	41	182

Note: Components may not sum to totals due to rounding.

Source: UNK-UNL

In addition to the direct impact, Table 8 also contains an estimate of the “multiplier” impact of the crane migration on the Central Nebraska economy. The multiplier impact captures the additional economic activity in the Central Nebraska region as money attracted to the region (direct impact) circulates further within the regional economy. For example, employees of Audubon’s Rowe Sanctuary and Crane Trust Nature & Visitor Center, or the hotels used by crane visitors, will spend their paychecks throughout the local economy on the various aspects of household spending such as mortgage or rent payments, home improvement, food,

retail shopping, insurance, transportation, health care (paid in part through benefits) and recreation and entertainment. Similarly, the two crane visitor centers, hotels and other directly impacted business will purchase a portion of supplies and services within the local economy. These multiplier impacts create additional revenue, labor income and employment at businesses throughout the Central Nebraska economy. The IMPLAN model also can be used to estimate these multiplier impacts, again by calculating ratios. For example, for the various types of spending shown in Table 8, the IMPLAN model can be used to calculate the ratio of multiplier output per dollar of direct output, the ratio of multiplier labor income per dollar of direct labor income, and the ratio of multiplier employment for each 10 direct jobs. These ratios are applied to the direct impact in order to estimate the multiplier impact. The multiplier impact is added to the direct economic impact to calculate the total annual economic impact for each type of spending, as seen in Table 8. The total annual economic impact of the crane migration is \$14.30 million in output, including \$5.26 million in labor income spread over 182 jobs.

B. Tax Revenue Impact Results

Since economic activity is taxed by local government in Nebraska, the economic impact listed in Table 8 implies local property, sales, and lodging tax revenue. This local tax revenue is estimated in Table 9. State income and sales tax revenue is not estimated because a significant share of visitors to the Central Nebraska region are from other parts of Nebraska, implying that their spending is not new to the state.

The sales tax base is determined by multiple factors. Visitor spending on lodging, retail, food and entertainment is subject to the sales tax. This \$8.03 million in spending generates \$120,000 in local sales tax revenue annually. In addition a portion of the \$1.50 million in labor income due to the multiplier impact is subject to sales tax. An estimated 35.2 percent of labor income is subject to sales tax, based on taxable sales and personal income data from 2016, yielding a \$0.53 million in taxable sales each year and \$8,000 in local sales tax revenue.⁴ The lodging tax base is \$2.76 million in lodging revenue. The lodging tax base is subject to an

⁴ Taxable sales are calculated as labor income from Table 8 times the percentage of labor income going toward taxable items – 35.2 percent. Taxable property is calculated as labor income from Table 8 times the ratio of \$1.47 in taxable property for each \$1 of income.

average 3.5 percent local lodging tax rate, given that the lodging tax is 4 percent in all the largest counties in the Central Nebraska region with the exception of Adams County, where the rate is 3 percent. Rates as low as 2 percent are found in some of the smaller counties. Applying the 3.5 percent average rate to \$2.76 million in lodging revenue yields \$97,000 per year in lodging tax revenue. For property tax revenue, the 2016 statewide ratio of taxable property (except agricultural land) for each dollar of personal income is 1.467. This ratio is applied to the \$5.26 million employee labor income impact to yield an estimated \$7.71 million in property tax base and \$154,000 in property tax revenue. The total local tax revenue impact from these sources is estimated to be \$379,000 per year.

Table 9: Annual Local Tax Revenue Impact

Local Tax Revenue Category	Economic Impact (Millions \$) [A]	Adjustment [B]	Tax Base (Millions \$) [C]	Tax Rate [D]	Tax Revenue (\$) [E]
Sales Tax					
Visitor Spending (Except Gasoline)	\$8.03	100.0%	\$8.03	1.5%	\$120,000
Multiplier Labor Income	\$1.50	35.2%	\$0.53	1.5%	\$8,000
Lodging Tax	\$2.76	100.0%	\$2.76	3.5%	\$97,000
Property Tax	\$5.26	146.7%	\$7.71	2.0%	\$154,000
Total					\$379,000

Note: Components may not sum to totals due to rounding.

Source: UNK-UNL

VI. CONCLUSIONS

This study estimated the annual economic and tax revenue impact of the Annual Crane Migration on Central Nebraska in 2017. This involved tracing the flows of spending attributable to the Annual Crane Migration in order to identify changes in output and jobs in Central Nebraska due to this economic activity. We estimated the spending of two groups: 1) the annual expenditures and employment of organizations devoted to crane preservation and watching, and 2) off-site visitor spending from visitors attracted to the Central Nebraska region by the crane viewing opportunity. To estimate the spending of crane visitors, we surveyed

these individuals during the 2017 Crane Migration at crane viewing venues and other roadside viewing locations. After spending was estimated, economic multipliers, which show the ratio of multiplier impacts to direct impacts, were calculated using the IMPLAN model. The IMPLAN model is the leading economic multiplier package in use in the United States, and can be used to calculate economic multipliers for around 400 industries for each U.S. state, county, or combination of state and counties.

We estimated that 46,500 crane visitors can be accounted for in Central Nebraska during the 2017 Migration, and of these, 93% or approximately 43,300 are non-Central Nebraska crane visitors. Overall, we found that the economic and tax revenue impacts make a significant contribution to the Central Nebraska economy. Audubon's Rowe Sanctuary and Crane Trust Nature & Visitor Center had a total economic impact of \$3.72 million and 46 full-time equivalent jobs on the Central Nebraska economy, whereas non-Central Nebraska crane visitor had a total economic impact of \$10.58 million and 136 jobs. Together, the overall economic impact of the Sandhill Crane Migration on Central Nebraska was \$14.30 million in 2017, supporting 182 year-round equivalent jobs. Moreover, given economic activity is taxed by local government, it is estimated that this economic impact generates \$379,000 per year in local property, sales, and lodging tax revenue.

Ecotourism is an emerging opportunity for Nebraska, and although the top ecotourism destinations for crane viewers are Audubon's Rowe Sanctuary, Crane Trust Nature & Visitor Center, and Fort Kearny State Park, secondary destinations that these visitors ventured to while in the state include Fort Robinson State Park, Valentine National Wildlife Refuge, Rainwater Basin Wetland Management District, Spring Creek Prairie, and Switzer Ranch and Nature Reserve. Thus, the Annual Crane Migration also yields other benefits on ecotourism sites around the state.

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APPENDIX A: CRANE VISITOR SURVEY

Survey for Economic Impact of Sandhill Crane Migration

(Please complete only one survey per group)

Your answers to this survey will be an important part of a study of the economic impact of the **Sandhill Crane Migration** to Central Nebraska.

Please only complete one survey per group. If you have already completed a survey at an earlier date this season, please don't repeat.

Please make your responses applicable to your current visit to observe the **Sandhill Crane Migration**.

Your answers will be completely **CONFIDENTIAL** and **ANONYMOUS**. We appreciate you taking the time to complete the survey.

Please fill in circles like this: Not like this:

- In which **country** do you live? United States
 Other: _____
- If you live in the United States, what is your zip code?

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- Have you visited and observed the Sandhill Crane Migration in Central Nebraska before? YES
 NO
- How did you learn about the Sandhill Crane Migration (check all that apply)

<input type="radio"/> Newspaper	<input type="radio"/> Hotel
<input type="radio"/> Magazine	<input type="radio"/> Brochure
<input type="radio"/> Email	<input type="radio"/> Website
<input type="radio"/> Television	<input type="radio"/> Facebook
<input type="radio"/> Visitor's Bureau	<input type="radio"/> Bird Association
<input type="radio"/> Word-of-Mouth	<input type="radio"/> Other Bird Festival

- How important was the **Sandhill Crane Migration** in your decision to come to the Kearney-Grand Island-Hastings-North Platte area? Please check **ONLY ONE** response.
 - It was the principal reason I came to the area
 - It was one of several reasons why I came to the area
 - It was mentioned in local visitor guides and looked interesting
 - It was not very important because I would have come to the area anyway
- How many **extra** days will you stay in the Central Nebraska area because of the **Sandhill Crane Migration**?
 - 0 days (experiencing the **Sandhill Crane Migration** has no effect on the length of my trip)
 - 1 day
 - 2 days
 - 3 days
 - 4 days
 - 5 days or more (please list how many additional days _____)

Please estimate your group's **typical daily** spending in the following categories while viewing Sandhill Cranes in Central Nebraska (Kearney, Grand Island, Hastings and North Platte area). That is, please include **ALL** spending for and by the entire group, not just your individual spending, in the local area.

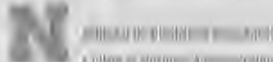
	NA	\$1-25	\$26-50	\$51-75	\$76-100	\$101-125	\$126-150	\$151-175	\$176+
5. Hotel/Lodging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Food and drinks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Gasoline/Fuel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Shopping (Souvenirs/Gifts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Entertainment (Arts, Theatre, Museums)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Other Spending (specify) _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- What crane viewing or other ecotourism/nature-based tourism venues have you or are you going to visit? (check all that apply)
 - Audubon's Rowe Sanctuary
 - Crane Trust Nature & Visitor Center
 - Fort Kearny State Park
 - Buffalo Bill State Park
 - Switzer Ranch and Nature Reserve/Calamus
 - Valentine National Wildlife Refuge
 - Crescent Lake National
 - Wildlife Refuge/4D Rush Lake Reserve
 - Wildcat Hills State Recreation Area
 - Roadside Viewing
 - Fort Robinson State Park
 - Rainwater Basin Wetland Management District
 - Toadstool Geologic Park
 - Spring Creek Prairie (Audubon)
 - Oglala National Grassland
 - Sandhills Motel (Mullen)
 - Prairie Chicken Dance Tours (McCook)
 - Pelican Watch (Harlan)
 - Other, please specify: _____

- How many people are included in the above spending?
 - 1
 - 2-4
 - 5-7
 - 8-10
 - 11+
- How many days have you or will you be visiting the Central Nebraska area?

<input type="radio"/> 1	<input type="radio"/> Two weeks
<input type="radio"/> 2-3	<input type="radio"/> Three weeks
<input type="radio"/> 4-6	<input type="radio"/> One month
<input type="radio"/> One week	<input type="radio"/> I live here

This study is made possible by the collaboration of the following partners:



Nebraska Central Platte River Region

For more details:

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