

THE ECONOMIC IMPACT OF THE SPRING CRANE MIGRATION ON THE SAN LUIS VALLEY OF COLORADO



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Cover photo by Michael Ciaglo

Background

Every year tens of thousands of Rocky Mountain greater sandhill cranes migrate through the San Luis Valley (SLV) of Colorado. This sub-population of sandhill cranes numbers about 25,000 and is endemic to the intermountain west. In Colorado and throughout their range, they face threats from habitat loss due to drought, human development, and changing agricultural practices.¹ Virtually the entire population of Rocky Mountain greater sandhill cranes migrates through the SLV, and the Valley represents a significant and vulnerable bottleneck in their yearly migration (Donnelly et al. In press). The SLV provides prime wetland roosting habitat and upland feeding grounds in the form of agricultural grains, but the wetlands have undergone historic change in recent decades,² and existential forces of water export³ and fluctuating agricultural markets threaten the future of these habitats and the crane migration.

The natural wonder of this migration brings tourists from around the state and the country to the SLV. The Monte Vista Crane Festival was established in 1983 to celebrate the migration and has increased this draw by providing crane tours, educational programming, and a wide variety of other entertainment for crane tourists. As the tourism surrounding this migration has grown it has become a significant economic driver for the area, particularly Alamosa and Rio Grande counties which have hotels and businesses in closest proximity to crane viewing opportunities.

Outdoor recreation constitutes a large part of Colorado's economy, and in recent years it has become an increasing focus of economic opportunity for the state. Wildlife watching has also grown in popularity due to its relative ease and accessibility, and this sector alone contributes \$2.4 billion dollars to the state's economy annually, according to a study conducted in 2017.⁴ The same study reported that in the South-Central region of Colorado, which includes the SLV, wildlife watching activities generated \$277 million dollars and was responsible for creating 1,916 jobs. Tourism specific to sandhill cranes has been shown to be a major economic driver in other areas. In Nebraska, where there is another large migration of sandhill cranes, it was found that sandhill crane tourism generated over \$9 million in direct spending⁵.

While wildlife watching, and crane tourism in particular, confer an obvious benefit to local economies, there is a lack of data specifically for the SLV. The counties within the SLV all rank in the bottom 10% of per capita income in the state and understanding specific economic drivers in the region would be of great value. The purpose of this study is to quantify the economic impacts of crane tourism to the SLV, and to provide local governments and a broad swath of stakeholders with the information necessary to understand, preserve, and capitalize upon this economic opportunity.

Methods

To conduct this study, we followed the methodology of two previous studies conducted to estimate the economic impact of the sandhill crane migration in Nebraska.^{5,6}

Study Area— We estimated the economic impact of the annual crane migration on the San Luis Valley of Colorado (SLV), a geographic area defined by mountain ranges on the north, east, and west (the Sawatch, Sangre De Cristo, and San Juan ranges, respectively) that comprise the Upper Rio Grande watershed, and the border of New Mexico and Colorado to the south. When using political boundaries (e.g., counties or

area codes) we included all of Alamosa, Conejos, Costilla, Saguache, and Rio Grande Counties as part of the SLV (Figure 1).

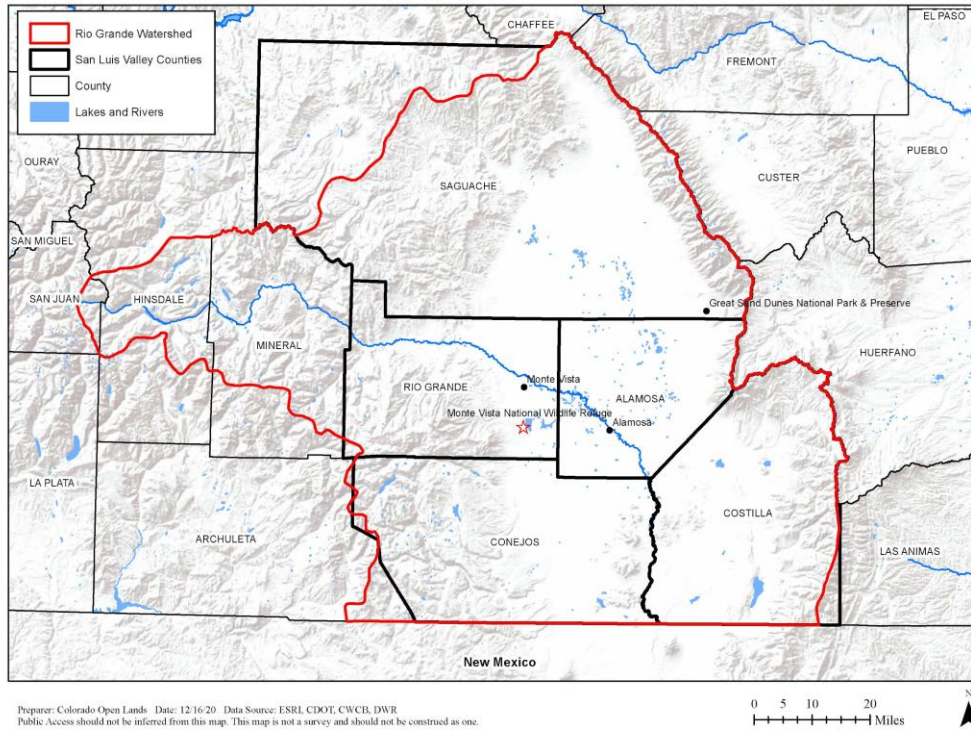


Figure 1. The study area consisted of the Upper Rio Grande Watershed (Red polygon) and Saguache, Rio Grande, Alamosa, Conejos, and Costilla counties (Dark black polygon), Colorado, USA.

Survey— We administered a survey to groups of visitors at crane tourist areas during the 2020 spring migration. Surveyors approached groups of visitors, explained the purpose of the research and, if they consented to participate, provided a clipboard, survey, and a pen or pencil to one member of the group. Respondents were asked a variety of questions about their trip—the survey instrument is included here as Appendix A. Surveys were administered at six main locations: Monte Vista National Wildlife Refuge Visitor Center, Alamosa National Wildlife Refuge Visitor Center, the three main crane viewing pullouts on the Monte Vista National Wildlife Refuge, and the arts and crafts fair that is part of the Monte Vista Crane Festival.

Visitation Estimation—We estimated the total number of crane visitors over a 30-day period from February 27th to March 27th, 2020 when cranes are typically present in large numbers in the SLV and tourist visitation is historically the highest. We placed pneumatic road tube counters (MetroCount, RoadPod VT5900) at five popular crane viewing sites on the Monte Vista and Alamosa National Wildlife Refuges to count the number of vehicles that visited each site per day. To correct for typical visitation to the wildlife refuges unrelated to the cranes we compared total number of cars during the crane migration to the total number of cars after the majority of cranes had left from March 28th through April 26th, 2020.

To estimate the total number of visitors and visitor days from the car counts we used the answers to a number of questions on the survey instrument. First, we categorized survey results by local or non-local visitors using zip codes from Question 2. Question 17 asked guests to estimate the number of times per day they visited each viewing area where a road counter was deployed. We used the average of answers to this question to correct the total number of cars for multi-site visitation. We then used average group size (Question 11) to estimate the total number of visitors. To calculate visitor days, we first corrected the total length of stay for each individual group using Questions 15 and 16 to only capture days spent in the San Luis Valley specifically for the sandhill crane migration, and then estimated the average length of stay. This average was finally used to estimate the total number of visitor days over the entire 30-day period, grouped by local and non-local visitation.

Direct Economic Impact—Questions 5-10 on the survey instrument asked respondents to estimate their typical daily spending per group per day based on nine different spending bins for six categories of activity (Hotel/Lodging, Food and Drinks, Gasoline/Fuel, Shopping, Entertainment, and Other). To evaluate spending when a group chose the ninth bin (More than \$176) we used a formula of: (category 8 – category 7) + low point of category 9 = category 9 spending. Due to the categorical nature of the data, we used the mode of the responses and the midpoint of the spending bins to estimate typical daily spending.

Results

Survey Administration—Survey administration was constrained by staff or volunteer availability, and surveys were administered on 3/1, 3/6, 3/7, 3/8, 3/10, 3/11, 3/14, and 3/15. During these times surveyors approached 273 groups for survey responses and received 261 survey responses, a 95.6% response rate. We intended to administer surveys throughout the 30-day period that cranes were present but stopped after 3/15 due to the spread of Covid-19 into Colorado and out of precaution to avoid contact between volunteers and tourists.

Visitation— We estimate visitors from the SLV made up 11.5% of visitation groups, and visitors from outside the SLV made up 88.5% of visitation groups. We observed an 89.3% decrease in car count visitation from the 30-day period with cranes to the 30-day period after cranes had left the SLV. Adjusting for normal local visitation through car counters, we estimate that 7,457 cars/groups visitors went through the Valley specifically for crane watching. Of these groups, 857 were local and 6,600 were from outside the SLV. Multiplied by the average group size (1.933 people per local group, 2.53 people per non-local group) we estimate that 1,657 local people and 16,685 non-local people visited crane viewing areas over the 30-day period.

Tourists visited from 164 different zip codes, 15 different states (Colorado, Arizona, Connecticut, Iowa, Kansas, Louisiana, Massachusetts, Michigan, Minnesota, New Mexico, New York, South Dakota, Texas, Wisconsin, Wyoming), and one other country (Canada). The majority of visitors (90.1%) were from within Colorado, and the top 5 counties Colorado survey respondent groups came from were: El Paso (29 groups), Denver (27 groups), Arapahoe (19 groups), Boulder (18 groups), and Jefferson (17 groups). Figure 2 displays the locations of residence for all respondents from within Colorado.

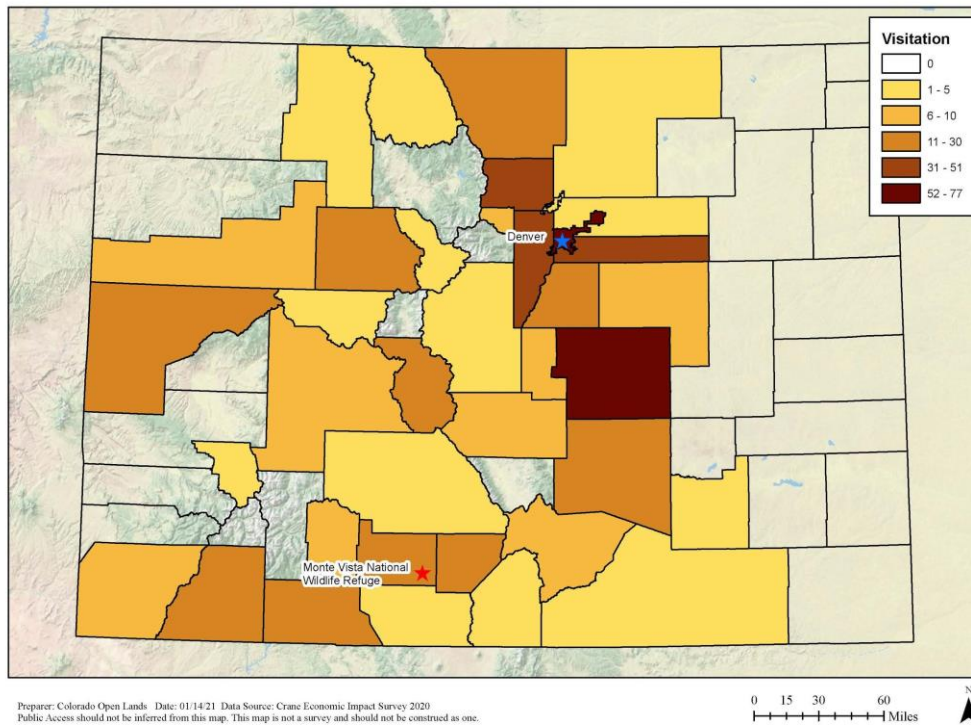


Figure 2. Visitation frequency of Colorado survey respondents by county.

Economic Impact—The average SLV local was likely to spend between \$1-25 on gasoline and between \$1-25 on shopping. Therefore, the average spending from a local crane watcher was \$26 at midpoint. The average non-local visitor was broken down into two groups, 1) those not spending on a hotel (potentially camping) or passing through and 2) those spending on a hotel. The minority of non-local visitors (72; 31.17%) were in category one, and the majority (159; 68.83%) were in category two. The average group in category one spent \$25-50 on food and \$25-50 on gas per day. The average group in category 2 spent \$101-125 on lodging, \$51-75 on food, \$25-50 on gas, and \$25-50 on shopping per day. Using the midpoint of the categorical data we estimate that SLV residents spend \$26 per day, nonlocals staying in hotels spend \$252 per day and other non-locals spend \$76 per day (Table 1).

	SLV Local	Non-local pass through	Non-local hotel
# of respondents	42	72	159
Spending person ⁻¹ day ⁻¹	\$26	\$76	\$252
Direct economic impact	\$3,713.67	\$473,31.49	\$2,872,800.04
Total direct revenue	\$3,349,885.20		
Total tax revenue	\$118,402.33		

Table 1. Spending and direct economic spending by visitor categories.

Therefore, discounting for local visitors and calculating the direct impact from non-local visitors, we estimate the economic impact of the crane watching over the 30-day period to be \$3,349,885.20. Broken down by categories of visitors, we estimate the economic impact to be \$3,713.67 from SLV residents, \$2,872,800.04 from non-locals who spent on hotels, and \$473,371.49 from other non-locals (Table 1).

To estimate tax revenue from visitor spending, we used the local tax rate of Alamosa county, where the majority of hotels and restaurants are located in the SLV. The local tax rate of 3% is similar to those of the surrounding counties (Conejos, 0%; Costilla, 1%; Rio Grande, 2.6%; Saguache, 2.5%). We excluded gasoline and state tax from this estimate because the majority of visitors are from Colorado. Using the 3% tax rate we calculated the tax revenue from visitor spending at \$92,638.33. Further, all local counties except Saguache county collect a 2% tax rate for lodging. Using this tax rate, we calculate an additional tax impact of \$25,764. Therefore, the total revenue from these two tax bases is \$118,402.33 (Table 1).

Finally, we asked respondents to estimate the total amount of money they would be willing to spend on additional services if they were offered in the SLV (Question 14, Appendix A). The small communities in the SLV have a limited ability to provide an abundance of services for the inconsistent tourists that visit for the crane migration. We asked respondents to identify potential services, such as additional tours or entertainment opportunities in town, that businesses might be able to provide as additional revenue sources. We estimate that on average, if additional services were offered, the local economy could capture an additional \$316,778 in revenue, including \$34,578 from local residents, \$229,571 from nonlocals who spend on hotels, and \$52,629 on nonlocal who do not spend on hotels.

Conclusion

We conducted the first comprehensive economic impact study of the sandhill crane migration in the San Luis Valley of Colorado. We found that the sandhill crane migration is a significant economic driver for the region, contributing nearly \$3.5 million to the local economy, including \$118,000 in local taxes. These findings show that the livelihoods of communities in the SLV are uniquely intertwined with this single species and the habitat that supports them.

Sandhill crane related ecotourism provides businesses in the Valley with significant revenue and allows the local economy to remain diversified. The crane migration attracts a unique group of tourists to the SLV that may not typically travel to this area. Virtually all tourists surveyed were visiting the SLV for the primary reason of viewing the sandhill crane migration, and the majority of these tourists were from outside of the region. The most common visitors to the SLV for other tourist activities are from metropolitan areas in Colorado, and while our data on the crane migration mirrors this trend, this event is attracting tourists during a time of the year when the majority of other tourism is not occurring. Sandhill crane migration ecotourism creates a unique opportunity for businesses to capture tourism dollars that are not typically available outside the region.

While sandhill cranes bring an obvious economic benefit to the SLV, the critical habitat that supports them is currently in decline. Sandhill cranes rely almost entirely on private agricultural lands while they are migrating through the SLV. Nearly 90% of their food requirements are met by waste grain left on barley fields after the harvest, and major crane roosts are located in wetlands on private land (Gammonley and Laubhan, unpublished data). As sustained droughts become the new normal, these private

agricultural operations are struggling to maintain the habitat that has supported the cranes up until now. Declining water supplies threaten to dry up wetlands and have caused the price of water to increase to a point where some farmers can no longer grow barley. If these trends continue without intervention the SLV may begin to see fewer cranes arriving each year, and eventually fewer tourists.

The annual sandhill crane migration through Colorado is a natural marvel. Sandhill cranes, and the habitat that they depend on, provide countless benefits to ecosystems and communities alike. By reporting on this research, we hope to demonstrate just one more reason that the sandhill cranes are intertwined with prosperity in the San Luis Valley.

References

1. *Colorado's 2015 State Wildlife Action Plan*.
https://cpw.state.co.us/Documents/WildlifeSpecies/SWAP/CO_SWAP_FULLVERSION.pdf (2015).
2. *San Luis Valley Wetland and Wildlife Conservation Assessment*.
<https://wetlanddynamics.com/projects/> (2019).
3. Protect San Luis Valley Water. <https://www.protectsanluisvalleywater.com/>.
4. *The 2017 Economic Contributions of Outdoor Recreation in Colorado*.
https://cpw.state.co.us/Documents/Trails/SCORP/2017EconomicContributions_SCORP.pdf (2018).
5. Dority, B. R., Thompson, R., Kaskie, S. & Tschauer, L. The economic impact of the annual crane migration on central Nebraska. *College of Business and Technology, University of Nebraska at Kearney, Kearney, NE* (2017).
6. Lingle, G. R. History and Economic Impact of Crane-watching in Central Nebraska. *North American Crane Workshop Proceedings* **6**, 33–37 (1992).

Appendix A

Sandhill Crane Economic Impact Survey – Spring 2020

Please complete only one survey per group

Your answers to this survey will be an important part of an economic impact study to help us preserve the Sandhill Crane Migration in the San Luis Valley of Colorado. Please make your answers applicable to your current visit to observe the Sandhill Crane Migration. Your answers will be completely CONFIDENTIAL and ANONYMOUS. Thank you for your time!

- 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 the San Luis Valley before? Yes
 No
- How did you learn about the Sandhill Crane Migration? (Check all that apply)

<input type="checkbox"/> Word-of-Mouth	<input type="checkbox"/> Magazine
<input type="checkbox"/> Website	<input type="checkbox"/> Visitors Bureau
<input type="checkbox"/> Social Media	<input type="checkbox"/> Hotel
<input type="checkbox"/> Newspaper	<input type="checkbox"/> Brochure

Please estimate your group's typical DAILY spending in the following categories while viewing Sandhill Cranes in the San Luis Valley. That is, please include ALL spending for and by the entire group locally, not just your individual spending.

	N/A	\$1-25	\$25-50	\$51-75	\$76-100	\$101-125	\$126-150	\$151-175	\$176+
5. Hotel/Lodging	0	0	0	0	0	0	0	0	0
6. Food and Drinks	0	0	0	0	0	0	0	0	0
7. Gasoline/Fuel	0	0	0	0	0	0	0	0	0
8. Shopping (Souvenirs/Gifts)	0	0	0	0	0	0	0	0	0
9. Entertainment (Arts, Museums)	0	0	0	0	0	0	0	0	0
10. Other (list) _____	0	0	0	0	0	0	0	0	0

- How many people are in your group and included in the above spending? _____ people
- How many days have you or will you be visiting the San Luis Valley? _____ days
 I live Locally
- If you are spending money on lodging in the San Luis Valley, please write the name of your accommodations (i.e. Airbnb, hotel name, campground name) and the town in which you are staying.
Name: _____
Town: _____

- If the following additional services/options were available during your trip, which would you spend money on? Please select all that apply and estimate how much your group would be willing to spend over your entire trip.

Additional Service	est. \$
<input type="checkbox"/> Private company crane tours	_____
<input type="checkbox"/> Access to crane photography blinds on private land	_____
<input type="checkbox"/> Additional events at businesses in town (e.g. live music, happy hours)	_____
<input type="checkbox"/> Other (specify) _____	_____

- How important was the Sandhill Crane Migration in your decision to visit the San Luis Valley? Please choose ONLY ONE response.
 - It was the principal reason I came to the area
 - It was one of several reasons I came to the area
 - It was mentioned in local visitors guides and looked interesting
 - It was not important because I would have visited the area anyways.
- If it is not your principal reason for visiting the San Luis Valley how many extra days will you stay because of the Sandhill Crane Migration?
 - 0 days (it has no effect on the length of my trip)
 - 1 day
 - 2 days
 - 3 days
 - 4 days
 - 5 or more (please list _____)
- Please estimate the number of times per day that you visited each area on the Monte Vista Refuge.
 - ____ Road 8 South Pullout for barley field
 - ____ Highway 15 east pullout for loafing wetland
 - ____ Auto Tour Loop at Monte Vista Visitor Center
- What other tourism venues have you or are you planning to visit?
 - Alamosa National Wildlife Refuge
 - Great Sand Dunes National Park
 - Rio Grande Natural Heritage Area
 - Local State Wildlife Areas
 - Bureau of Land Management Areas
 - Forest Service Land
 - Hot Springs (please name): _____
 - Other (please specify) _____

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



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