

# Economic Impact of Mountain Biking in the Custer Gallatin National Forest

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Image Credit: Jason Thompson



# Executive Summary of Study

Custer Gallatin National Forest (CGNF) is an important American mountain biking destination.

Mountain bikers visit the CGNF over 260,000 times per year. An estimated 30% of these visits are from persons living outside the CGNF and surrounding region.

Over 579 mountain bikers from around the nation responded to our survey with 485 sharing their economic expenditures on their most recent to six study areas within the CGNF.

Based on the economic impact analysis and NVUM visitation figures, the research team estimates:

1. Mountain bike visitors who are not local residents annually spend an estimated \$9.1 million in the CGNF.
2. Mountain bike visitors' expenditures in the CGNF support 111 jobs and \$3.4 million in job income within the region.



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# Meet Your Research Team

**DR. JAMES N. MAPLES** is an associate professor of sociology at Eastern Kentucky University, where he examines the political economy of renewable tourism. His research interests include the economic impact of outdoor recreation and social change in rural areas. In his free time, he is conducting an oral history of rock climbing in Kentucky's Red River Gorge. He is also an Eagle Scout, Girl Scout dad, and metal detectorist.



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**DR. MICHAEL J. BRADLEY** is an associate professor and director of graduate studies in the Department of Recreation and Park Administration at Eastern Kentucky University. His professional and academic interests include human dimensions of natural resource and wildlife management as well as sustainable recreation practices as it relates to outdoor recreation.



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## CONTACT INFORMATION FOR FUTURE STUDIES

Our research team regularly conducts economic impact studies, surveys, assessments, interpretation studies, and other kinds of community-driven studies. If you or your organization is interested in conducting a study, please contact lead researchers Dr. James Maples or Dr. Michael Bradley (emails above) for further information.

# Methodological Notes

## STUDY PURPOSE

Working alongside Outdoor Alliance and the International Mountain Bicycling Association, the research team conducted this study to examine the annual economic impact of mountain biking visitors in the CGNF based upon expenditures from their most recent 2017 or 2018 visit.

## DATA COLLECTION

The researchers collected data using an online survey available from July 14, 2018 until August 24, 2018. This is best treated as a convenience sample. The final survey language is available upon request. The survey included questions examining economic expenditures across fifteen sectors and are outlined in this report. The survey included questions about where the respondent lives the majority of the year, the size of the group accounted for in the respondent's economic impact questions, and a lodging selection. The research team used all of these questions in creating the economic estimates.

## ANALYSIS

This study uses established techniques utilized in previous peer-reviewed economic impact studies. First, respondents were sorted by local residents (respondents who self-reported as being a resident of the CGNF and immediate surrounding area) and visitors (respondents self-reporting as living outside the CGNF area). Local residents are separated from the economic impact estimates as their expenditures, while important, are not typically treated as true economic impact. Their mean expenditures are, however, reported as a supplement to the economic impact estimates.

Second, mean expenditures were established for mountain biking visitors in each study area for each of the fifteen economic impact categories. Means are also included for expenditures outside the study area but still within the state of Montana.

Third, group sizes in expenditures are addressed by dividing the respondent's reported expenditures by their reported group size.

Fourth, respondent cases in each mean with values higher than the third standard deviation were marked as missing data. This technique prevents overestimating economic impact and provides reliable, conservative means.

Fifth, these means are entered into IMPLAN, an industry-leading economic impact calculation system, which uses input-output modeling to establish economic impact across three measures: output, value added, and job income.

Sixth, these estimates are shaped by visitation data from the National Visitor Use Monitoring survey conducted by the Forest Service. Visitation data were verified with International Mountain Bicycling Association and broken down by study area to create a more nuanced economic estimate by study area.



# Study Regions

Tables 1A - 1E include the five study areas examined in this analysis. Economic impact study areas in this study are built around common mountain biking destinations and the cities and towns where mountain biking visitors are most apt to spend funds as part of their trip.

## REGION ONE: BOZEMAN / BIG SKY

This study area consists of two areas from the original survey: Bozeman and Big Sky. Bozeman is a central city for the CGNF mountain biking community. Bozeman provides easy access to trails in the Bridger Range to the north and in the Gallatin National Forest to the south. It also includes the northern Gallatins, Bozeman Pass, Bear Canyon, Hyalite, Stormcastle, and Gallatin Canyon, which are all popular mountain biking areas. Big Sky includes mountain biking in the Spanish Peaks and southern Gallatins. This area is modeled in the Gallatin County and Madison County.

This study area contains a gross regional product of nearly \$6 billion and a total personal income of \$5.3 billion. There are over 88,000 employees in 276 industries. The area covers just over 6,100 square miles and has a population of 112,426.

## REGION TWO: LIVINGSTON / PARADISE VALLEY / CRAZY MOUNTAINS

This study area combines two initial study areas from the survey (Livingston / Paradise Valley and Crazy Mountains). Mountain biking near Livingston lies to the southeast in the Gallatin National Forest in Park County. The Crazy Mountains (northeast of Livingston along the Park and Sweet Grass County line includes additional remote mountain biking trails. This area also includes the Absaroka Mountains trails. The area is modeled in Park and Sweet Grass Counties, which includes both Livingston and Big Timber.

This area contains over 4,500 acres. There are an estimated 19,737 persons living in the area within an estimated 8,916 households. Here, the gross regional product exceeds \$760 million while the total personal income is an estimated \$880 million.

Table 1A

<b>Economic Indicator Summary of Bozeman / Big Sky</b>	
<i>Indicator</i>	<i>Value</i>
Gross Regional Product*	\$5,949,534
Total Personal Income*	\$5,395,045
Total Employment	88,753
Number of Industries	276
Land Area (square miles)	6,104
Population	112,426
Total Households	46,657

Table 1B

<b>Economic Indicator Summary of Livingston / Paradise Valley / Crazy Mountains</b>	
<i>Indicator</i>	<i>Value</i>
Gross Regional Product*	\$760,874
Total Personal Income*	\$880,646
Total Employment	12,797
Number of Industries	191
Land Area (square miles)	4,519
Population	19,737
Total Households	8,916

\*Gross Regional Product and Total Personal Income listed in 1000s

# Study Regions, Continued

## REGION THREE: RED LODGE / COOKE COUNTY / PRYOR MOUNTAINS

This study area assembles three areas examined in the survey into one central area that shares an overlapping economic expenditure area. Red Lodge (which is often described as a gateway to the Yellowstone National Forest in nearby Wyoming) provides access to numerous mountain biking opportunities in the Custer National Forest. Likewise, Cooke City (which is just north of Wyoming’s state line) offers access to mountain biking in the same region but from another entry point. The Pryor Mountains are to the east of Red Lodge and offer remote mountain biking trails in the area. The area is modeled entirely in Carbon and Park Counties, which include the towns of Cooke City and Red Lodge and the likely expenditure areas for visitors to the Pryors. Note that no expenditures in nearby Wyoming were examined in this study.

In this study area, the total personal income exceeds \$1 billion and a gross regional product of \$791 million. There are over 26,000 residents and nearly 12,000 households in the study area.

## REGION FOUR: SIOUX AND ASHLAND RANGER DISTRICTS

This rural study area consists of two Forest Service districts in the southeastern corner of Montana along the South Dakota border. The area includes a portion of the Northern Cheyenne Indian Reservation and the Blue Mud Hills. This study area is modeled in three rural counties: Rosebud, Carter, and Powder River.

This study area contains over \$714 million in gross regional product and total personal income of \$475 million. This is a larger study area at over 11,000 square miles, but with a lower population of only around 12,000.

Table 1C

<b>Economic Indicator Summary of Red Lodge / Cooke County / Pryor Mountains</b>	
<i>Indicator</i>	<i>Value</i>
Gross Regional Product*	\$791,469
Total Personal Income*	\$1,168,660
Total Employment	15,672
Number of Industries	199
Land Area (square miles)	4,712
Population	26,574
Total Households	11,999

Table 1D

<b>Economic Indicator Summary of Sioux and Ashland Ranger Districts</b>	
<i>Indicator</i>	<i>Value</i>
Gross Regional Product*	\$714,848
Total Personal Income*	\$475,637
Total Employment	7,997
Number of Industries	152
Land Area (square miles)	11,669
Population	12,236
Total Households	4,623

\*Gross Regional Product and Total Personal Income listed in 1000s

# Study Regions, Continued

## REGION FIVE: WEST YELLOWSTONE

West Yellowstone is located on the Montana and Wyoming state line. It is also due north of the Montana/Idaho state line. It offers another gateway into the Yellowstone National Forest. This study area is modeled in Gallatin County, which includes West Yellowstone. It also includes mountain biking trails in Hebgen and the Lionhead.

This study area includes over \$5.5 billion in gross regional product and \$5 billion in personal income. However, it should be noted that a great portion of this activity is located farther north in Bozeman.

Table 1E

Economic Indicator Summary of West Yellowstone	
<i>Indicator</i>	<i>Value</i>
Gross Regional Product*	\$5,557,058
Total Personal Income*	\$5,007,193
Total Employment	82,336
Number of Industries	271
Land Area (square miles)	2,511
Population	104,502
Total Households	42,926

## Visitor Mean Expenditures

Tables 2A and 2B detail overall mean visitor expenditures inside the study areas. Mean expenditures are an averaged figure of what economic activity one outdoor recreation visit (on average) to the study area creates.

Mean expenditures were separately created for visitors and local residents across fifteen common economic impact categories covering most every facet of expenditures on a typical trip to the CGNF study areas.

Each table includes means that have previously had all cases above three standard deviations recoded as missing data to discourage points of influence that overstate economic impact. The means and standard deviations listed in the table are the result of this process, hence they may still include cases three deviations above the new estimates.

Table 2A

Visitor Mean Expenditures in the Bozeman / Big Sky Study Area (Estimated 53,875 Annual Visits)					
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Fast food	53	\$7.79	10.43	0	30
Sit-down dining	39	\$25.34	21.38	0	67
Grocery Stores	60	\$28.31	37.12	0	133
Gas station food	49	\$2.16	3.43	0	10
Gasoline & oil	43	\$23.07	18.52	0	50
Retail gear	62	\$29.13	64.01	0	300
Retail, non-food	54	\$5.98	11.96	0	50
Rental gear	62	\$0.20	1.59	0	13
Guide service	64	\$0.00	0.00	0	0
Rental Car	63	\$0.00	0.00	0	0
Taxi / Uber / Lyft	61	\$0.00	0.00	0	0
Adventure tourism	61	\$11.38	23.20	0	90
Entertainment	58	\$3.12	7.75	0	35
Hotels & resorts	53	\$8.68	28.81	0	133
Camping	59	\$0.85	4.56	0	25

\*Gross Regional Product and Total Personal Income listed in 1000s

# Visitor Mean Expenditures, Continued

**Table 2A** (previous page) details the mean expenditures in the Bozeman/Big Sky study area. There, the biggest expenditures were in retail gear (such as mountain bikes) at \$29.13, groceries at \$28.31, and sit-down dining at \$25.34. On average, visiting mountain bikers in this study area spent an estimated \$146.01 per trip to the CGNF.

**Table 2B** summarizes expenditures for multiple study areas: Livingston / Paradise Valley / Crazy Mountains, Red Lodge / Cooke County / Pryor Mountains, Sioux and Ashland Ranger Districts<sup>1</sup>, and West Yellowstone.

Each of the four areas has much lower visitation rates (when compared to Bozeman). As a result, there were also fewer survey responses. To address issues with modeling means on fewer cases, the research team instead estimated a single set of mean expenditures to be used in all four areas.

**Table 2B** sums these mean expenditures for the remaining areas. The highest expenditures were in sit-down dining (\$22.06), gasoline (\$10.12), and groceries (\$10.06). Here, visiting mountain bikers spent an average of \$53.61 per trip.

**Table 2B**

<b>Visitor Mean Expenditures in Remaining Study Areas (Estimated 24,865 Annual Visits)</b>					
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Fast food	21	\$0.24	1.09	0	5
Sit-down dining	17	\$22.06	23.52	0	60
Grocery Stores	15	\$10.06	15.70	0	40
Gas station food	20	\$2.88	4.68	0	13
Gasoline & oil	11	\$10.12	14.78	0	40
Retail gear	23	\$0.87	4.17	0	20
Retail, non-food	20	\$1.56	5.14	0	21
Rental gear	25	\$0.00	0.00	0	0
Guide service	24	\$0.00	0.00	0	0
Rental Car	25	\$0.00	0.00	0	0
Taxi / Uber / Lyft	25	\$0.00	0.00	0	0
Adventure tourism	23	\$0.51	2.43	0	12
Entertainment	22	\$1.14	5.33	0	25
Hotels & resorts	21	\$0.00	0.00	0	0
Camping	24	\$4.17	20.41	0	100

<sup>1</sup> Although included as a study area option in the survey, Sioux and Ashland Ranger Districts received zero economic expenditure responses for visitors or residents. Instead, the average means for the remaining study areas are used as a replacement.



# Economic Impact Terminology

In the following paragraphs, three terms describe economic impact: *direct effect*, *indirect effect*, and *induced effect*.

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**Direct effect** is the economic impact created by the presence of the economic activity. For example, if a local restaurant sells \$1K in food, its direct effect would be \$1K.

**Indirect effect** is economic activity created when local businesses purchase goods and services from other local industries as a result of the direct effect.

**Induced effect** is the estimated local expenditures by local households and employees as a result of income created from the direct effect.

**Labor income impact** is measured by the estimated labor income created by the economic activity in the region. This is a conservative measure of economic impact.

**Value added** is a measure of the increase in the study region's gross domestic product. Gross domestic product is a measure of all goods and services produced in the study area and is treated as a measure of the size of the economy.

**Output** is a measure of the increase in business sales revenue in the study area as a result of the economic impact being studied. It includes business revenues as well as costs of doing business. It includes value added as part of its calculation.

# Economic Impact Modeling

**Table 3A** summarizes the economic impact of mountain bike visitors in the Bozeman/ Big Sky study area. In this study area, mountain biking visitors' expenditures support 98 jobs and \$3.1 million in labor income.

**Table 3A**

<b>Economic Impact Summary of Mountain Biking Visitors in Bozeman / Big Sky Study Area</b>				
<i>Impact Type</i>	<i>Jobs Supported</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct	75.3	\$2,227,203	\$2,728,614	\$4,695,254
Indirect	9.5	\$354,794	\$725,469	\$1,316,191
Induced	13.8	\$535,705	\$943,638	\$1,650,228
<b>Total Effect</b>	<b>98.7</b>	<b>\$3,117,702</b>	<b>\$4,397,720</b>	<b>\$7,661,673</b>

**Table 3B** summarizes the economic impact of mountain biker visitors in the Livingston / Paradise Valley / Crazy Mountains study area. There, mountain bike visitors support an estimated four jobs and over \$108,000 in labor income.

**Table 3B**

<b>Economic Impact Summary of Mountain Biking Visitors in Livingston / Paradise Valley / Crazy Mountains Study Area</b>				
<i>Impact Type</i>	<i>Jobs Supported</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct	3.4	\$89,843	\$95,151	\$178,736
Indirect	0.3	\$7,305	\$14,489	\$29,912
Induced	0.4	\$11,526	\$20,747	\$38,779
<b>Total Effect</b>	<b>4.1</b>	<b>\$108,674</b>	<b>\$130,388</b>	<b>\$247,428</b>

**Table 3C** lists economic impact for mountain bike visitors in the Red Lodge/Cooke City/ Pryor Mountains study area. There, their expenditures support \$54,000 in labor income for workers.

**Table 3C**

<b>Economic Impact Summary of Mountain Biking Visitors in Red Lodge / Cooke City / Pryor Mountains Study Area</b>				
<i>Impact Type</i>	<i>Jobs Supported</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct	1.8	\$43,626	\$54,191	\$96,539
Indirect	0.2	\$5,380	\$10,715	\$22,994
Induced	0.2	\$5,414	\$10,113	\$18,924
<b>Total Effect</b>	<b>2.2</b>	<b>\$54,420</b>	<b>\$75,019</b>	<b>\$138,456</b>

**Table 3D** describes mountain biker visitors' economic impact in the Sioux and Ashland Ranger Districts study area. These expenditures support the existence of an estimated \$12,743 in labor income each year.

**Table 3D**

<b>Economic Impact Summary of Mountain Biking Visitors in Sioux and Ashland Ranger Districts Study Area</b>				
<i>Impact Type</i>	<i>Jobs Supported</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct	0.5	\$11,161	\$13,968	\$25,391
Indirect	0.0	\$863	\$1,511	\$3,888
Induced	0.0	\$718	\$1,631	\$3,212
<b>Total Effect</b>	<b>0.5</b>	<b>\$12,743</b>	<b>\$17,109</b>	<b>\$32,490</b>

# Economic Impact Modeling, Continued

Finally, **Table 3E** summarizes mountain bike visitors to the West Yellowstone area. There, mountain bike visitors contribute support to five jobs and \$158,000 in job income.

**Table 3E**

<b>Economic Impact Summary of Mountain Biking Visitors in West Yellowstone Study Area</b>				
<i>Impact Type</i>	<i>Jobs Supported</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct	4.6	\$113,684	\$120,225	\$230,131
Indirect	0.4	\$16,585	\$33,511	\$61,031
Induced	0.7	\$28,036	\$48,910	\$85,390
<b>Total Effect</b>	<b>5.7</b>	<b>\$158,305</b>	<b>\$202,646</b>	<b>\$376,551</b>

## Taxation Generation Within the Study Areas

**Table 4A**

<b>Annual Estimated Taxation Generated by Mountain Biking Visitors in Bozeman / Big Sky Study Area</b>		
<i>Tax Type</i>	<i>State &amp; Local</i>	<i>Federal</i>
Employee Compensation	\$17,845	\$376,955
Proprietor Income	\$0	\$20,845
Tax on Production & Imports	\$214,670	\$23,989
Households	\$87,249	\$191,027
Corporations	\$9,549	\$65,012

**Table 4A** explains the tax contributions of mountain bike visitors' expenditures in the Bozeman/Big Sky study area. There, mountain biking visitors add over \$329,313 in taxes to the state and local economy. At the federal level, expenditures generate an estimated \$677,828 in taxes.

**Table 4B**

<b>Annual Estimated Taxation Generated by Mountain Biking Visitors in Livingston / Paradise Valley / Crazy Mountains Study Area</b>		
<i>Tax Type</i>	<i>State &amp; Local</i>	<i>Federal</i>
Employee Compensation	\$646	\$14,191
Proprietor Income	\$0	\$567
Tax on Production & Imports	\$4,771	\$682
Households	\$2,942	\$6,375
Corporations	\$118	\$794

**Table 4B** lists taxes generated by mountain bike visitors in the Livingston / Paradise Valley / Crazy Mountains study area. Mountain bike visitors generate an estimated \$8,477 in state and local taxes, as well as \$22,000 in federal taxes in this study area.

# Taxation Generation within the Study Areas, Continued

**Table 4C**

<b>Annual Estimated Taxation Generated by Mountain Biking Visitors in Red Lodge / Cooke City / Pryor Mountains Study Area</b>		
<i>Tax Type</i>	<i>State &amp; Local</i>	<i>Federal</i>
Employee Compensation	\$339	\$7,849
Proprietor Income	\$0	\$182
Tax on Production & Imports	\$3,155	\$320
Households	\$1,449	\$3,150
Corporations	\$100	\$662

**Table 4C** lists taxes supported by mountain bike visitors in the Red Lodge/ Cooke City/Pryor Mountains area. Here, mountain bike visitors support \$5,043 in state/local taxes. Their visits also generate over \$12,163 in federal taxes.

**Table 4D**

<b>Annual Estimated Taxation Generated by Mountain Biking Visitors in Sioux and Ashland Ranger District Study Area</b>		
<i>Tax Type</i>	<i>State &amp; Local</i>	<i>Federal</i>
Employee Compensation	\$75	\$1,379
Proprietor Income	\$0	\$70
Tax on Production & Imports	\$592	\$153
Households	\$312	\$681
Corporations	\$43	\$239

**Table 4D** summarizes taxes generated in the Sioux and Ashland Ranger District. There, mountain bikers generate an estimated \$1,022 in state/local taxes and just over \$2,500 in federal taxes.

**Table 4E**

<b>Annual Estimated Taxation Generated by Mountain Biking Visitors in West Yellowstone Study Area</b>		
<i>Tax Type</i>	<i>State &amp; Local</i>	<i>Federal</i>
Employee Compensation	\$920	\$19,268
Proprietor Income	\$0	\$963
Tax on Production & Imports	\$7,762	\$862
Households	\$4,435	\$9,705
Corporations	\$331	\$2,254

Finally, **Table 4E** summarizes taxes in the West Yellowstone study area. Mountain bike visitors support over \$13,000 in state/local taxes. They also support over \$33,052 in federal taxes.

# Visitor Expenditures Beyond Study Area But In State

**Table 5** summarizes expenditures for visitors making trips to the CGNF and, in the process, also spending funds outside the study area. Each year, mountain bike visitors expend an average of \$89.55 outside the study area but still in Montana as a result of trips to the CGNF. Their highest expenses include gasoline (\$24.73), general retail purchases (\$15.34), and sit-down dining (\$14.69).

**Table 5**

<b>Tourists Spending Outside Study Area but still in Montana (Estimated 78,400 Annual Visits)</b>					
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Fast food	87	\$3.81	8.57	0	40
Sit-down dining	86	\$14.69	32.82	0	200
Grocery Stores	88	\$12.56	29.10	0	100
Gas station food	87	\$1.85	4.71	0	25
Gasoline & oil	87	\$24.73	43.63	0	300
Retail gear	87	\$4.02	18.12	0	125
Retail, non-food	86	\$15.34	31.37	0	150
Rental gear	89	\$0.00	0.00	0	0
Guide service	90	\$0.00	0.00	0	0
Rental Car	90	\$0.00	0.00	0	0
Taxi / Uber / Lyft	90	\$0.00	0.00	0	0
Adventure tourism	87	\$0.57	4.41	0	40
Entertainment	87	\$0.69	3.97	0	30
Hotels & resorts	85	\$3.64	16.09	0	100
Camping	87	\$7.64	41.08	0	300



# Local Resident Expenditures by Study Area

Tables 6A - 6B describe local residents expenditures as a result to visits to one of the study areas. Although local resident mountain bikers are not regarded as true economic impact in their local economies, local residents do make a noted contribution to the local economy while visiting the CGNF.

Table 6A looks at resident expenditures in the Bozeman/Big Sky study area. There, resident mountain bikers spend an average of \$251.36 per trip. This is largely inflated due to purchasing mountain bikes (retail gear, \$94.69). Without this category, the average is \$156.67, which includes a mixture of general retail (\$36.23), gas (\$34.74), and sit-down dining (\$30.88).

Table 6A

Local Resident Expenditures in Bozeman / Big Sky Study Area (Estimated 125,708 Annual Visits)					
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Fast food	244	\$4.50	19.67	0	250
Sit-down dining	263	\$30.88	58.59	0	300
Grocery Stores	264	\$29.97	96.14	0	1000
Gas station food	264	\$4.10	12.94	0	100
Gasoline & oil	265	\$34.74	74.80	0	500
Retail gear	262	\$94.69	384.58	0	3500
Retail, non-food	267	\$36.23	266.50	0	3000
Rental gear	270	\$0.00	0.00	0	0
Guide service	270	\$0.23	3.80	0	63
Rental Car	271	\$0.00	0.00	0	0
Taxi / Uber / Lyft	271	\$0.00	0.00	0	0
Adventure tourism	271	\$9.58	69.08	0	1000
Entertainment	269	\$4.99	24.37	0	200
Hotels & resorts	266	\$0.13	2.04	0	33
Camping	266	\$1.32	12.04	0	160

# Local Resident Expenditures by Study Area, Continued

**Table 6B** looks at resident visits to the remaining study areas. There, residents spend an estimated \$98.66 per trip. In this case, the greatest means are in sit-down dining (\$26.97), gas (\$20.87), and retail gear purchases (\$16.22).

**Table 6B**

<b>Local Resident Expenditures in Bozeman / Big Sky Study Area (Estimated 125,708 Annual Visits)</b>					
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Fast food	48	\$4.17	11.22	0	50
Sit-down dining	52	\$26.97	50.38	0	200
Grocery Stores	49	\$12.27	37.56	0	200
Gas station food	51	\$5.80	16.57	0	100
Gasoline & oil	52	\$20.87	28.29	0	125
Retail gear	51	\$16.22	50.52	0	300
Rental gear	50	\$2.90	10.69	0	50
Guide service	53	\$0.00	0.00	0	0
Rental Car	53	\$0.00	3.80	0	0
Taxi / Uber / Lyft	53	\$0.00	0.00	0	0
Adventure tourism	53	\$0.00	0.00	0	0
Entertainment	53	\$7.17	27.83	0	150
Hotels & resorts	52	\$1.92	8.86	0	50
Camping	51	\$0.00	0.00	0	0
Retail, non-food	52	\$0.38	2.77	0	20

# Local Resident Expenditures Beyond Study Area But Inside State

Local residents also continue to spend funds outside the study area as a result of visits to the CGNF. For example, these expenditures might include travel to the CGNF and the costs of travel. Local residents spent an average of \$100.74 outside the study areas but still within the Montana state borders as a result of recreating in the CGNF.

**Table 7** summarizes expenditures of local residents outside the study area but inside Montana. Expenditures of these kinds are highest in rental gear (\$32.18), gasoline (\$16.60), and retail gear (\$15.50). Again, these are expenditures that occur because of a trip to the CGNF to ride mountain bikes.

**Table 7**

<b>Local Resident Expenditures Beyond Study Area but inside Montana (Estimated 183,727 Annual Visits)</b>					
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Fast food	317	\$2.98	26.90	0	400
Sit-down dining	324	\$14.76	68.90	0	1000
Grocery Stores	323	\$8.42	28.50	0	200
Gas station food	323	\$2.43	10.82	0	100
Gasoline & oil	323	\$16.60	55.87	0	500
Retail gear	323	\$15.50	122.70	0	2000
Rental gear	321	\$32.18	243.97	0	3000
Guide service	324	\$0.00	0.00	0	0
Rental Car	325	\$0.18	3.33	0	60
Taxi / Uber / Lyft	325	\$0.00	0.00	0	0
Adventure tourism	326	\$0.00	0.00	0	0
Entertainment	326	\$6.06	39.79	0	500
Hotels & resorts	323	\$1.21	9.30	0	100
Camping	321	\$0.00	0.00	0	0
Retail, non-food	320	\$0.42	5.92	0	100

## **OMISSIONS & CONSIDERATIONS**

During the research process, the research team identified minor issues that should be noted. First, as is always the case with economic impact studies, the findings in this report must be treated as estimations. This economic impact study utilizes mean figures to estimate expenditures that may vary from year to year, visit to visit, event to event, and person to person.

Second, this study does not account for length of visit. As point of reference, visitors in the study indicated staying an average of 3.3 days when staying at least one night.

Third, collecting economic impact data well after the initial day of expenditures can result in unavoidable errors in data collection. For examples, respondents rounding expenditures to the nearest dollar, forgetting expenditures, or misstating expenditures are common issues. As such, the research team recommends repeating this study by collecting data in the field at or around the day expenditures are made.

Fourth, this study uses generalized categories (e.g. mountain biking) to account for expenditures across more than one form of outdoor recreation. Individual outdoor recreation types may have unique spending patterns that are lost in aggregated data. The researchers suggest conducting future field studies on separate outdoor recreation categories to create a more nuanced economic estimate.

Fifth, NVUM visitation estimates are unable to account for every single visit that occurs into a particular area or study area. Outdoor recreation is particularly easy to undercount as outdoor recreation users are often less visible or in remote areas of a national forest.

Sixth, NVUM classification of visitor use includes generalized uses (e.g. bicycling), which may cause inflation in the actual number of visits for the use being studied. As well, NVUM data allow for recreational users to visit the CGNF for more than one purpose. As such, persons and expenditures represented in this study may also overlap with other user groups' economic contributions.

Seventh, this study makes the assumption that the majority of bicycle use in the CGNF is attributed to mountain biking. This may cause under or overestimations of economic impact as a result. Working with IMBA, it was estimated that 80% of the visits included in this category were mountain biking.

Eighth, the estimates in this report look to account for approximately 95% of visitors to the CGNF in a given year by focusing on the major areas of use. This may result in underreporting users of areas not included in the report.