

**Economic Impacts of Mountain Biking and Bike Trail Events and Festivals in West Virginia**

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## Introduction

Mountain biking and mountain biking facilities can bring an array of benefits to rural communities. They leverage communities' natural assets to create places that are attractive to visitors, businesses, and both new and current residents. Specific, documented benefits include health benefits for local users, increased tourism and economic development opportunities, and benefits to the local environment<sup>1</sup>.

In the U.S., an estimated 50 million people (20% of Americans 16 and over) mountain bike. The most recent membership statistics from the International Mountain Biking Association (IMBA) show that their riders are young professionals who are well educated and affluent. The median age for members is 44 years old; 76% have a bachelor's degree or higher (compared to 31% for the U.S. and 21% for WV); 53% reported work in professional/managerial positions; median household income is \$100,000 (compared to \$60,336 for the nation and \$43,469 for the state)<sup>2</sup>.

Although communities are often concerned about low wages and the seasonal nature of tourism, data suggest that recreation opportunities can generate significant economic impacts. In 2012 FICOR (the Federal Interagency Council on Outdoor Recreation, including the National Park Service, U.S. Fish and Wildlife Service, Bureau of Land Management, U.S. Forest Service, and others) estimated that visitor spending for recreation on federal lands and waters generated \$51 billion in income and supported 880,000 jobs<sup>3</sup>. Data from the USDA, Economic Research Service show that between 2000 and 2014 rural, recreation dependent counties not only grew the fastest in population but reported the highest median household incomes<sup>4</sup>. Similarly, the outdoor recreation sector's contribution to gross domestic product and overall economic growth continues to increase. Data from the Bureau of Economic Analysis's Outdoor Recreation Satellite Account shows that the outdoor recreation sector grew 4.4% between 2012 and 2016, compared to 3.6% for the economy overall. In fact, outdoor recreation contributes a larger share of GDP than many industry sectors that are commonly the focus of economic development efforts in rural areas. In 2016, outdoor recreation generated \$374 billion, or 2% of U.S. GDP, larger than both mining (1.4%) and utilities (1.5%).

2015 survey data<sup>5</sup> from 1,406 bikers show that riders take an average of two vacations explicitly for mountain biking each year and bring their bikes on two additional trips where riding is not the primary reason for the trip. More than half of mountain biking trips are two days or less; the average distance traveled from home for MTB trips was 566 miles, but half of all trips were 250 miles or less from the riders' home. Riders spent an average of \$382 per trip. The top lodging choices were tent campgrounds, hotels, and with local friends. The top travel months are May, June, and September.

Data from the Outdoor Industry Foundation (2006) show that the South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV) is home to 25% of the adult population and more than 10 million bicyclists. The region reported \$8.2 billion in bicycling trip-related expenditures which

contributed a total of \$11.3 billion to the region's economy, supported 135,000 jobs, and generated more than \$1.6 billion in annual state and federal tax revenue.

In addition to trip related expenses like lodging, IMBA data show that riders valued amenities including brew pubs, coffee shops, and local retail, and a community that is supportive of mountain biking and outdoor culture<sup>6</sup>. Data from the Singletracks blog<sup>7</sup> suggest similar trends: beyond mountain biking, riders indicated hiking and drinking as their top two activities; surveyed riders indicated that they consumed 48% of their meals in restaurants when traveling.

### **Local and Regional Impacts of Mountain Biking**

There are multiple examples of how small towns, especially those transitioning from economies dominated by natural resource extraction are leveraging their natural resources for outdoor recreation tourism, and mountain biking specifically. For example:

- Oakridge, Oregon struggled after the closure of a local mill in the 1980s. Since 2004, the town has rebranded itself as a mountain biking destination; riders spend an estimated \$2.4 to \$5 million a year in the local economy<sup>8</sup>.
- In the former iron ore mining town of Crosby, Minnesota, within seven years of opening a trail network, at least 15 new businesses—including a wood-fired pizza restaurant, a yoga studio, and a craft brewery have been opened to serve visiting riders<sup>8</sup>.
- The Nantahala and Pisgah National Forests of North Carolina have become important mountain biking destinations; Pisgah is routinely listed as one of the most visited destinations for avid bikers. Mountain biking generates more than \$48 million in regional spending including \$30 million in visitor spending. The sport supports 366 full time jobs and \$9 million in labor income<sup>9</sup>.
- Bentonville, Arkansas resurgence as a mountain bike destination began in early 2000 and was fueled by interest from the Walton Family. Trail development has focused on developing opportunities for all skill levels that start and end and weave through the community. Bentonville is now recognized as a cycling mecca, is a silver level IMBA Ride Center with over 100 miles of singletrack trails and 57% of trail users from outside of NW Arkansas, and is home to IMBA Trail Labs<sup>10</sup>.
- The northeastern corner of Vermont, known as the Northeast Kingdom, is the most rural part of the state. Declines in the regional forestry and paper industries have resulted in the highest unemployment and poverty rates in the state. Kingdom Trail Association (KTA), a 501(c)3 non-profit organization, was established in 1994 by a group of visionary residents and business leaders in the area. Their goal was “to encourage recreational use of the Northeast Kingdom that is ecologically sensitive and promotes the natural beauty of the region.” In 2016, an economic impact estimated a total of nearly \$8 million in direct expenditures annually as a result of KTA visits, including lodging, food and drink, gifts/souvenirs, transportation, admission fees, and equipment

with 75% of trail users from outside of VT staying for an average of 2.7 days. Average group size was 4 with average spending per group for overnight visitors \$1,317<sup>11</sup>.

- The Wayne National Forest and Athens Bicycle Club began a collaborative process in 2017 to develop a destination-level, mountain-bike optimized trail system in a portion of the Forest called the Bailey Tract with 84 miles of trails to be constructed in 5 phases envisioning the trail system providing significant quality of life, economic, and health benefits to southeast Ohio communities and residents. With the trail system estimated to spur visitation to 180,000 visitors per year, the first decade is projected to generate \$24.8 million in local economic spending, \$8.6 million in additional wages, \$6.9 million in increased government revenue, and 65 jobs created or retained.
- Marquette, Michigan, situated in Michigan's remote Upper Peninsula, has a history of economic challenges with 26% of the population with an annual income of \$15,000 or less. Marquette focused on ecotourism and mountain biking as an economic development strategy and in 2014 was designated a Bronze-level Ride Center by the International Mountain Bike Association and recognized as one of America's top mountain biking towns<sup>12</sup>.
- Former steel town Anniston, Alabama, located in the foothills of the Appalachian Mountains had no major tourism attractions, development challenges, and a declining population. Through a variety of funding sources they invested in more than 100 miles of entry- and advanced-level trails which resulted in downtown revitalization, a Bronze-level IMBA Ride Center, and estimated numbers of bikers ranging from 15-37,000 with economic impacts from riding range from a low of \$1.3 million to \$3.8 million resulting in an increase in sales, income, and lodging taxes and home sales and a steady decrease in unemployment<sup>17</sup>.
- British Columbia is well known for its unique and challenging mountain biking trails. A 2006 pilot study revealed that the trail systems of the North Shore, Squamish and Whistler, are estimated to have collectively generated \$10.3 million in spending from riders that live outside of the host community over the period from June 4 to September 17, 2006. The combined expenditures of non-resident riders on the trail systems in the three communities resulted in a total of \$9.3 million in new economic activity (GDP) and supported 194 jobs through the payment of just over \$6.3 million in wages and salaries. The Whistler Bike Park, the most visited mountain bike park in North America, was a considerable source of revenue for both Whistler and the Province of BC. Non-resident visitors to the WBP spent an estimated \$16.2 million in Whistler. The Crankworx Mountain Bike Festival saw more than 55,000 unique visitors attending the 2006 edition of the event, of which more than 23,000 travelled solely to attend the Festival, resulting in non-resident expenditures in excess of \$11.5 million. Whistler has been able to capture higher visitor expenditure in part by having the ability to promote its municipal trails and associated services (bike rentals, guides, camps, etc) directly to visitors both within the resort and externally. The study found that there was less than 10% cross

over between Whistler Bike Park riders and those on the Whistler Valley Trails reinforcing the notion that the Valley Trails were a significant stand-alone draw<sup>13</sup>.

### **Mountain Biking in West Virginia and the Mountain Highlands**

Mountain biking, in an organized capacity, first came to West Virginia and the community of Davis, WV in 1983. Before 1983 riders explored the forest roads, trails, and the famous Blackwater 100 race course in search of lands open for public use. At the time, land use restrictions on West Virginia's public lands were non-existent or extremely limited relative to surrounding states. As a result, the state drew passionate mountain bike enthusiasts from hundreds of miles away.

By the mid-eighties Blackwater Bikes, one of the state's premier bike shops, was established in Davis. The Canaan Mountain Series – one of the longest running mountain bike race series in the world – was also a fully functioning race series by this time, thanks to Laird Knight<sup>14</sup>. The series produced “24 Hours of Canaan,” the first 24-hour mountain bike race; two other events continue in 2019, the “Blackwater Classic” and North America's second oldest bike race, “Revenge of the Rattlesnake.”

Further south, Pocahontas County, WV hosts over 375 miles of trails situated on vast amounts of public land including five state parks, two state forests, and a large portion of the Monongahela National Forest. Trail systems include the Tea Creek Gauley Headwaters with classic hand cut trails, old rail beds and skid grades, roots, technical rock gardens, and steep climbs and descents. Snowshoe Mountain, the state's largest ski resort also provides both downhill and cross-country biking and serves as one of the nation's top lift-accessed bike parks. The county's trails offer a storied history of mountain biking including early Fat Tire Festivals, Wild 100 and West Virginia Mountain Bike Association (WVMBA) Ultra Races, and the Slatyfork Enduro.

Other events are organized across the state by the WVMBA which provides advocacy and support for mountain biking in West Virginia and manages the West Virginia cross country and enduro mountain biking race series. WVMBA members are involved in the development, maintenance and management of hundreds of miles of trails which improve the quality of life for West Virginia's citizens and help fuel the state's economy.

### **2017-2018 West Virginia Mountain Bike Festival and Event Survey Results**

To better understand the preferences of mountain bikers in West Virginia, surveys were collected by West Virginia University faculty and event organizers at mountain bike races and festivals in 2017 and 2018. Surveys were collected in-person at the 2017 Blackwater Classic race (45), 2017 Canaan Mountain Bike Festival (93), 2018 Canaan Mountain Bike Festival (19), and collected online in Qualtrics through a link sent via email to event participants following the

2017 Dirtfest WV (132), 2018 Dirtfest WV (122), 2018 Slatyfork Enduro race, and 2018 Snowshoe Freefall Festival/WVMBA Enduro Race (31). These events drew more than 2,500 individuals. Surveys were collected from 474 attendees for a total response rate of 19% (Table 1).

**Table 1. Survey Collection by Event**

Event	Surveys Collected	Event Attendance	Response Rate
2018 Slatyfork WVMBA Enduro Race	32	57 <sup>15</sup>	56%
2018 Snowshoe FreeFall Festival/Enduro Race	31	86 <sup>16</sup>	36%
2018 Canaan Valley Mountain Bike Festival	19	292	7%
2018 Dirtfest WV	122	952	13%
2017 Blackwater Classic Race	45	82 <sup>17</sup>	55%
2017 Canaan Mountain Bike Festival	93	249	37%
2017 Dirtfest WV	132	807	16%
<b>Total</b>	<b>474</b>	<b>2,525</b>	<b>19%</b>

Riders who completed surveys were drawn from 30 states and the District of Columbia (Table 2). Across all the events, riders from West Virginia represented just 14% of surveyed attendees. Attendees were most likely to come from neighboring states including Pennsylvania (649, 32%), Maryland (348, 17%), and Virginia (284, 14%). When large festivals were removed from analysis, West Virginia riders represented a larger share of attendees (58%); however, neighboring states were still well represented (Table 3).

**Table 2. Location of Primary Residence, All Events**

Primary Residence	2018				2017			Total	% of Total
	Slatyfork Enduro	Snowshoe Freefall	Canaan <sup>18</sup> MTB Fest	Dirtfest <sup>18</sup>	Blackwater Classic	Canaan <sup>18</sup> MTB Fest	Dirtfest <sup>18</sup>		
PA	5	8	13	301	5	13	304	649	32%
MD		1	21	161	4	22	139	348	17%
WV	12	20	30	90	32	39	71	294	14%
VA	9		29	99	4	30	113	284	14%
OH	3	1	15	47	5	14	55	140	7%
NY			1	44			31	76	4%
NC	1		3	36		1	19	60	3%
MA			17	3		8	6	34	2%
NJ				20			13	33	2%

**Table 2 ctd. Location of Primary Residence, All Events**

Primary Residence	2018				2017			Total	% of Total
	Slatyfork Enduro	Snowshoe Freefall	Canaan <sup>18</sup> MTB Fest	Dirtfest <sup>18</sup>	Blackwater Classic	Canaan <sup>18</sup> MTB Fest	Dirtfest <sup>18</sup>		
DC			3	6		1	12	22	1%
DE				10			7	17	1%
IN				17			11	28	1%
KY	1			4				5	0%
NM				2		2		4	0%
ID			1			1		2	0%
WI			2					2	0%
MO				1				1	0%
ME				2				2	0%
LA				3				3	0%
IL				8				8	0%
FL				2			2	4	0%
CT				2			2	4	0%
CO				5			2	7	0%
CA				1			1	2	0%
AL				4				4	0%
GA							3	3	0%
MI							1	1	0%
NH							8	8	0%
TN							5	5	0%
UT							1	1	0%
<b>Total</b>	<b>31</b>	<b>30</b>	<b>135</b>	<b>868</b>	<b>50</b>	<b>131</b>	<b>806</b>	<b>2,051</b>	<b>100%</b>

**Table 3. Location of Primary Residence, Races Only**

	Slatyfork Enduro	Snowshoe Freefall	Blackwater Classic	Total	% of Total
WV	12	20	32	64	58%
PA	5	8	5	18	16%
VA	9		4	13	12%
OH	3	1	5	9	8%
MD		1	4	5	5%
NC	1			1	1%
KY	1			1	1%
<b>Total</b>	<b>31</b>	<b>30</b>	<b>50</b>	<b>111</b>	<b>100%</b>

Most survey respondents (85%) participated in five or fewer mountain bike events annually (Table 4). Although survey participants were asked about “events” rather than mountain bike “vacations,” these results are in line with previous surveys which showed that bikers take an average of two vacations explicitly for mountain biking each year and bring their bikes on two additional trips where riding is not the primary reason for the trip<sup>7</sup>.

**Table 4. Number of Annual Mountain Bike Events**

Number of Events Attended	Frequency	Percent
1-5	279	85%
6-10	24	7%
11-14	11	3%
15-19	12	4%
20+	4	1%
Total	330	100%

The average group size was 3.3 individuals. Parties stayed for an average of 2.5 nights (Table 5). In most cases, riders chose to camp at or near the location of the event. However, this was a function of both preference and the availability of lodging amenities (Table 6). For example, in high amenity areas like Snowshoe and Canaan, riders were much more likely to choose hotel accommodations or rented vacation homes.

**Table 5. Number of Nights Away from Primary Residence**

Number of Nights	Frequency	Percent
1	61	15%
2	185	45%
3	114	28%
4	26	6%
5	11	3%
6	4	1%
7	3	1%
8	1	0.2%
9	0	0.0%
10	1	0.2%
More than 10	3	0.7%
Total	409	100%



**Table 6. Lodging Choice at Events With and Without Nearby Amenities**

	Amenities in Close Proximity		Amenities Unavailable	
	Frequency	Percent	Frequency	Percent
Hotel/Motel	17	11%	31	11%
Rented house	22	14%	1	0%
Inn/Traditional	4	3%	5	2%
Seasonal home	19	12%	1	0%
Airbnb	9	6%	0	0%
Family/Friends	29	18%	11	4%
Campground/Camping	28	18%	193	70%
Other	26	17%	31	11%
RV	3	2%	1	0%
Total	157	100%	274	100%

In line with data from IMBA, surveyed riders reported higher than average household incomes (Table 7). Nearly half of the respondents reported household income greater than \$100,000 and 78% reported household income above \$60,000. For comparison, West Virginia’s median household income in 2017 was \$43,469 and the U.S median household income was \$60,336.

**Table 7. Approximate Household Income, Before Taxes**

HHI (Before Taxes)	Frequency	Percent
Less than \$20,000	8	2%
\$20,001 to \$40,000	41	10%
\$40,001 to \$60,000	42	10%
\$60,001 to \$80,000	54	13%
\$80,001 to \$100,000	76	18%
\$100,000+	193	47%
Total	414	100%

Spending on equipment and gear associated with mountain biking activities ranged from under \$1,000 for a quarter of surveyed respondents to as high as \$10,000-\$15,000 (Table 8). Most respondents (56%) spent between \$5,000 and \$10,000 annually.

**Table 8. Annual Spending on MTB Equipment and Gear**

Amount Spent	Frequency	Percent
Less than \$1,000	83	26%
\$1,001 to \$5,000	182	56%
\$5,001 to \$10,000	47	14%
\$10,001 to \$15,000	11	3%
\$15,001 to \$20,000	1	0%
\$20,000+	1	0%
Total	325	100%

Although respondents were drawn from all skill levels, most rated their skill level as intermediate (63%) or expert (30%) (Table 9).

**Table 9. Respondents' Skill level**

Novice	4	1%
Beginner	19	6%
Intermediate	207	63%
Expert	100	30%
Total	330	100%

### **Estimated Economic Impacts of Mountain Biking Activities in West Virginia**

The economic impacts of the mountain biking in West Virginia is estimated using a state specific model generated using IMPLAN's modeling software<sup>19</sup>, an industry standard input-output model of the economy. Expenditures by riders from outside of the state or region generate direct spending in the local economy. This direct spending stimulates additional purchases and causes impacts along the supply chain. For example, increased demand for business inputs (utilities, office supplies, legal services) will result in additional rounds of purchases by local businesses (indirect impacts); employees will also make purchases (induced impacts). The combined direct, indirect, and induced impacts represent the total economic impact of these activities.

Spending from those outside the state/region will bring additional tourism income to businesses and residents. Table 9 summarizes spending reported by previous studies and the authors' estimates from the surveys collected at West Virginia mountain bike races and events. Based on these numbers, reasonable estimates for spending are approximately \$40 for local riders and \$150 for non-local users.

**Table 9. Estimated Average Spending by Local and Non-Local Users for Selected Mountain Bike Trail Systems**

Trail System and State	Local User Daily Expenditure (2018 dollars)	Non-Local User Daily Expenditure (2018 dollars)
Coldwater Bike Trail <sup>20</sup> (AL), 2012	\$68	\$154
Jackson Hole <sup>21</sup> (WY), 2011	\$8	\$144
Chequamegon area <sup>22</sup> (WI), 1997	No separation of users, average of \$43	
Nantahala and Pisgah National Forests <sup>9</sup> (NC), 2018, Est.	\$68	\$155
Kingdom Trails <sup>15</sup>	\$115	\$120
Tucker County, WV, 2018	\$20	\$143

Riders will represent a mix of both local and non-local visitors; however, spending by locals likely serves as an alternative to other entertainment and recreation spending that would have occurred in the state/region; therefore, only non-local visitor spending is counted as an impact to the economy. Estimating the number of riders that will use local trails or visit a region to ride is difficult. In Appalachian North Carolina, visits to the region anchored by Robbinsville (pop. 620) and Bryson City, NC (pop. 1,424),<sup>23</sup> were estimated at 17,000 visits per year<sup>9</sup>. However, for communities that are less accessible, have limited trail systems, or have just recently added trails even these numbers may be overly ambitious. Because precise estimates for riders are not available we provide an estimate of the economic impact per 1,000 riders<sup>24</sup>. Table 10 shows a breakdown of spending by category for non-local riders in West Virginia.

**Table 10. Non-local Spending by Category**

Category of Event-Related Expenditure	Non-Local Rider Per-Person Estimate	Estimated Non-Local Spending (Per Person Spending * 1,000)
Overnight Lodging	\$37.50	\$37,500
Groceries	\$15.77	\$15,769
Food at Restaurants	\$40.00	\$40,000
Alcohol at Bars and Taverns	\$29.17	\$29,167
Fuel	\$20.83	\$20,833
Average Per Person Spending	\$143.27	\$143,269

Spending by 1,000 non-local riders is estimated to generate \$113,700 in direct impacts in the economy (Table 11). This spending will generate an additional \$58,700 in secondary impacts as these dollars are re-spent. In total, these expenditures would contribute \$172,400 in business volume, support two jobs, and generate approximately \$60,000 in wage and proprietor income. Tax impacts to the state and local economy are estimated at \$13,000.

**Table 11. Economic Impact of 1,000 Non-Local MTB Riders**

	Direct Impact	Indirect & Induced Impacts	Total Economic Impact
Output (Sales)	\$113,700*	\$58,700	\$172,400
Employment	1.5	0.5	2
Labor Income	\$40,700	\$18,600	\$59,300
State & Local Taxes	--	--	\$13,000
*The direct impact is less than the estimated \$143,300 due to the application of retail margins.			

**Select Comments from Survey Respondents**

What could have been done to improve mountain biking in West Virginia?

- Advertise more.
- Build purpose built XC trails in National Forest.
- Trail maintenance. Purpose built trails in National Forest.
- More trails/More MTB trails.
- More involvement in Charleston, WV.
- More trail access.
- Better trail maintenance.
- More trails and more camping.
- More purpose built trails.
- More trail building events
- Paid trail workers to keep things in shape.
- More trails, better trail marking/maps, and more beginner friendly trails to try out the sport without being intimidated.

Do you have any additional comments about this event or your visit to this destination?

- Top notch event. Tons of potential to grow. Epic trails.
- Great event. WVMBA MTB events are well run.
- More trails (MTB specific).
- Awesome event, well organized, great trails.
- Great event. Keep it going!

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- <sup>1</sup> <https://www.scribd.com/document/260028699/Economic-Impacts-of-MTB-pptx-pdf>
  - <sup>2</sup> IMBA Member profile + US Census Bureau, 2016 American Community Survey 1-Year Estimates
  - <sup>3</sup> [https://www.fs.fed.us/research/docs/outdoor-recreation/ficor\\_2014\\_rec\\_trends\\_economic\\_opportunities.pdf](https://www.fs.fed.us/research/docs/outdoor-recreation/ficor_2014_rec_trends_economic_opportunities.pdf)
  - <sup>4</sup> <https://www.ers.usda.gov/amber-waves/2016/december/using-the-ers-county-economic-types-to-explore-demographic-and-economic-trends-in-rural-areas/>
  - <sup>5</sup> Singletracks.com; <https://www.singletracks.com/blog/mtb-trails/mountain-bike-tourism-by-the-numbers/>
  - <sup>6</sup> IMBA presentation National Summit for Gateway Communities December 2018
  - <sup>7</sup> <https://www.singletracks.com/blog/mtb-trails/mountain-bike-tourism-by-the-numbers>
  - <sup>8</sup> <https://www.outsideonline.com/2184491/how-mountain-biking-saving-small-town-usa>
  - <sup>9</sup> [https://www.imba.com/sites/default/files/content/resources/2018-06/OA\\_NPNF\\_MtnBikingStudy.pdf](https://www.imba.com/sites/default/files/content/resources/2018-06/OA_NPNF_MtnBikingStudy.pdf)
  - <sup>10</sup> <https://www.visitbentonville.com/bike/trail-maps/off-road/>
  - <sup>11</sup> Kingdom Trail Association (KTA) Annual Economic Impact (VT Trails and Greenways Council, 2016)
  - <sup>12</sup> Assessment of the Effects of Mountain Biking Marquette Michigan's Ecotourism
  - <sup>13</sup> Sea to Sky Mountain Biking Economic Impact Study. (2006). Western Canada Mountain Bike Tourism Association.
  - <sup>14</sup> <https://mmbhof.org/laird-knight/>
  - <sup>15</sup> <https://www.webscorer.com/race?raceid=147065>
  - <sup>16</sup> <https://www.webscorer.com/race?raceid=149532>
  - <sup>17</sup> <http://www.wvoutside.com/iplay/Events/?eid=2017/05/16488r.html>
  - <sup>18</sup> Data provided by festival organizers
  - <sup>19</sup> Additional information about IMPLAN can be found at <http://www.implan.com/>
  - <sup>20</sup> [https://headwaterseconomics.org/wp-content/uploads/Trail\\_Study\\_13-coldwater-mountain-bike-trail.pdf](https://headwaterseconomics.org/wp-content/uploads/Trail_Study_13-coldwater-mountain-bike-trail.pdf)
  - <sup>21</sup> [https://headwaterseconomics.org/wp-content/uploads/Trail\\_Study\\_16-jackson-hole-trail-project.pdf](https://headwaterseconomics.org/wp-content/uploads/Trail_Study_16-jackson-hole-trail-project.pdf)
  - <sup>22</sup> <https://www.cambatrails.org/wp-content/uploads/2017/03/Economic-Impact-Study-1997.pdf>
  - <sup>23</sup> The population of Graham County (8,861) and Swain County (13,981) in 2010
  - <sup>24</sup> IMPLAN uses fixed-proportion production patterns (ie. if output doubles inputs must also double) which allows the impact estimates to be easily scaled up or down. For example, if we assume 10,000 non-local riders the estimates would be multiplied by 10.