

**PROJECT BRIEF:
THE ECONOMIC IMPACT OF MOUNTAIN BICYCLE EVENTS IN OREGON**

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Institutional Review Board Approval

Linfield College's Institutional Review Board (IRB) Committee for Human Participation Research approved this project (IRB # 00003172).

Executive Summary

The current project aimed to quantify the economic impact of several mountain biking events and one tour operator in Oregon during 2012. Participants from three events and customers of one mountain bike tour company (Cog Wild) were surveyed in 2012 using an online survey. Hereinafter Cog Wild customers are referred to as participants, and Cog Wild as an event. This brief report summarizes the initial data analysis of participant responses to the survey questions. Specifically, the report outlines county level economic impact travel estimates, participant demographics, travel party size and spending averages across the four events. Only data from non-local participants (i.e., participants living outside of the event host county) were used for the economic impact analysis.

The specific events were:

- High Cascades 100 Endurance Mountain Bike Race (HC 100), a one-day event held in Bend (Deschutes County) in July.
- Mountain Bike Oregon (MBO), a three-day event held in Oakridge (Lane County) in July and August.
- USA Cycling Marathon Mountain Bike National Championships (Marathon), a one-day event held in Bend in September.
- 2012 Customers of Cog Wild (Cog Wild) mountain bike tours and shuttles, in Bend.

The final economic impact analysis can be found in Appendix A.

Key Findings:

- The events attracted a total of 1,727 participants (HC 100=282; MBO=725; Marathon=240; Cog Wild=480) to Oregon from 28 U.S. States, including Hawaii, and from four different countries (Canada, Austria, Australia and New Zealand).
- Participant response rates varied by event and survey question. Only fully completed surveys were used to calculate response rates. The overall response rate across all four events was 35%. Specific event response rates were: 64% (HC 100); 33% (MBO); 26% (Marathon); and 24% (Cog Wild).
- 65% of survey respondents listed their home Zip Code from outside of Oregon.
- A large percentage of the survey participants were male (82%). Respondents ranged in age from 18 to 74 years of age. A moderate proportion (44%) of the survey respondents were between the ages of 35-44. Across all four events, less than 1% were between the ages of 18-24; 17% were 25-34; 29% were 45-54; 8% were 55-64; and 1% was 65-74.

- 43% of the survey respondents reported an annual household income between \$100,000-\$199,999, and 29% reported an annual household income of \$200,000 or more.
- Participants reported that their average length of stay in the event county was 3.9 nights (+/- .93 nights). By comparison, the 2010 Cross Nationals participants stayed an average of 3.6 nights and Bend's non-event length-of-stay is approximately 4.2 nights (Lindberg, 2010; Visit Bend, 2012).
- The average travel party size was 2.98 people across all four events. There was high travel party size variability (range: 1-25 people; +/-2.36). By comparison, the average non-event travel party size visiting Bend in 2012 was 3.4 people (Visit Bend, 2012).
- Average expenditure per person per day was \$99, weighted equally across all four events. For comparison, the average summer visitor to Bend in 2012 spent \$96 per person per day (Visit Bend, 2012).
- The average expenditure per travel party, by event, was: \$1,680 (Cog Wild); \$1,230 (HC 100); \$1,210 (MBO); and \$900 (Marathon).
- The direct county level tourism spending, by event, was: \$1.2 million (MBO); \$765,400 (Cog Wild); \$389,600 (HC 100); and \$213,200 (Marathon). By comparison, the direct tourism spending generated by the 2009 U.S. Road Nationals, held in Bend, equaled \$1.44 million in direct tourist spending (Lindberg, 2009).
- Three measures of economic impact (sales, labor income and jobs) were estimated for each event. After the multiplier effect was applied, the total sales impact, by event, was \$1.69 million (MBO); \$1.08 million (Cog Wild); \$608,500 (HC 100); and \$309,700 (Marathon). Each event generated labor income and jobs: \$647,900 and 26 jobs (MBO); \$388,500 and 13 jobs (Cog Wild); \$168,900 and 9 jobs (HC 100), and \$91,200 and 4 jobs (Marathon).

Introduction

Trails are a community asset and provide indirect and direct benefits to the region in which they are located. Various studies have evaluated the benefits of trails noting improvements in health (Brownson et al., 2000; Moore, Graefe, Gitelson, & Porter, 1992; Shafer, Lee, & Turner, 2000; Wang et al., 2005), environmental preservation (Hay, 1991; Shafer et al., 2000), community development (Moore et al., 1992; Shafer et al., 2000), housing and property values (Crompton, 2001; Krizek, 2006; Lindsey, Man, Payton, & Dickson, 2004; Moore et al., 1992; Seattle Office for Planning, 1987), and various forms of economic impact (Bowker, Bergstrom & Gill, 2007; Fix & Loomis, 1997; Wisconsin Department of Tourism, 2000; York County Department of Parks and Recreation, 2002).

Perhaps due to the beauty that many observers have noted in the land that trails preserve, trail users and real estate agents have indicated that trails increase the value of nearby property. For example, a study of the Burke-Gilman Trail in Seattle, Wash., showed that property values increased by approximately 6% and crime rates significantly decreased in areas surrounding the trail (Seattle Office for Planning, 1987). Trail amenities facilitate social interaction and have led to increased community pride by local residents (Moore et al., 1992; Shafer et al., 2000).

Further, trail facilities have the potential to provide significant economic benefits to the local community in which they are housed. Trails provide motivation for visitors to travel to an area and stay for several nights (Kaliszewski, 2011; American Trails, 1998; Fix & Loomis, 1997). Trail facilities bring people together to walk, run, ski and/or bike. Bicycle events occurring on trails, such as the Michigander and the Midwest Tandem Rally in Michigan and the Fat Tire 40 in Wisconsin have attracted thousands of participants and spectators, bringing direct spending into these states (Governor's Bicycle Coordinating Council, 2006; Nelson, Vogt, Lynch, & Stynes, 1999). Other bicycle events such as Cross Nationals in Bend, Ore., and RAGBRAI in Iowa have generated \$1.08 million and \$24.7 million to the local region, respectively. The results from these events are encouraging and provide a foundation for communities to consider promoting their own personalized event. Events such as the Michigander and the Midwest Tandem Rally were based on urban trails, but communities are beginning to see the value of rural trails for mountain biking events. Mountain biking has become a popular activity within the U.S. and beyond (Outdoor Foundation, 2012; Moran, Tresidder & McVittie, 2006). Data from other biking events are promising, yet there are very few studies that have empirically documented the economic impact of mountain biking events within the U.S. Due to the potential economic benefits of trails, the current project aimed to quantify the economic impact of several mountain biking events and one tour operator in Oregon during 2012.

Methodology

Targeted events

Participants from three mountain bike events: High Cascades 100 (Bend, Ore.; Deschutes County), Mountain Bike Oregon (Oakridge, Ore.; Lane County), Mountain Bike Marathon Championships (Bend; Deschutes County), and one Oregon-based tour operator (Cog Wild based in Bend; Deschutes County) were surveyed online for current study. Events were held during the 2012 season (June-October).

Instrumentation

The online survey¹ was developed using previously validated economic impact surveys (Linberg, 2010, 2009a, 2009b; White & Stynes, 2008). Two external content experts reviewed the survey to increase its content validity. The initial draft survey was pilot-tested for wording and consistency during the Echo Red 2 Red event held in Echo, Ore., in March 2012 (543 participants; 30% response rate). Data were shared with the content experts and edits to the initial survey were made. A second draft online survey was reviewed and edited by the event organizers. A final draft of the online survey was pilot-tested by the researchers and several colleagues before its launch.

Event organizers contacted their participants via email on the Tuesday following the event to reduce self-report errors. The researchers were not privy to the participants' contact information prior to the survey launch. Participants were given a choice to voluntarily submit their email address at the end of the survey. They were provided with a modest inducement if they submitted their email.

¹ Please contact the corresponding author (Dr. Jeff McNamee) to request a copy of the survey.

Appendix A

Economic Impact Analysis
Oregon Mountain Bike Events and Cog Wild Customers

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In order to estimate one component of the economic impact of mountain biking in Oregon, participants in three events and customers of one company were surveyed in 2012 (for simplicity, hereinafter Cog Wild customers are referred to as participants, and Cog Wild as an event). The events were:

- **HC 100:** High Cascades 100 Endurance Mountain Bike Race, held in Bend in July.
- **MBO:** Mountain Bike Oregon, held in Oakridge in July and August.
- **Marathon:** USA Cycling Marathon Mountain Bike National Championships, held in Bend in September.
- **Cog Wild:** Customers of Cog Wild mountain bike tours and shuttles, in Bend.

Sample sizes and 95% confidence intervals for the expenditure per person per day estimates are shown in Table 1.¹

	Completes (expenditure question)	Confidence interval, percentage +/-
Marathon	63	11%
MBO	237	4%
HC 100	178	9%
Cog Wild	106	13%

The survey was conducted online after each event. It included questions regarding travel party size, the number of participants in the travel party, the number of nights spent in the relevant county (Deschutes for Bend, Lane for Oakridge), and expenditure by the travel party in the relevant county, across nine categories:

- Lodging, including hotels, motels, rental, RV / campgrounds, etc.
- Restaurants and pubs
- Food and drink purchased at grocery or convenience stores
- Event fees
- Souvenirs, clothing, and retail shopping
- Amusements / attractions / tours
- Gas and oil
- Bike repair, equipment, equipment rental
- Local transportation, shuttle services, including any car rental

Expenditure per household or travel party is a common reporting approach because large items, such as lodging and fuel, are paid at the household or travel party level and are not easily divisible by respondents to a per-person basis. Nonetheless, persons in a travel party may make additional purchases unbeknownst to the respondent. These expenditures brought economic benefit, but were not captured by the survey.

¹ Based on weighted expenditure, but not adjusted for different types of MBO participants.

This analysis only includes expenditure made by non-locals, those persons not residing in the relevant county. Cog Wild participants were included only if mountain biking was the primary reason for the vacation that included riding with Cog Wild (Question 16 = Yes).

The analysis includes expenditure made by persons in the travel party, regardless of whether they were participants, on the assumption that non-participants were in the destination county due to the event. "Person days" is the product of 1) party size and 2) number of nights in county plus one.

The raw data was cleaned to remove unusable responses and to adjust some expenditure data. All amounts reported under "event fees" by Cog Wild participants were re-allocated to "tours." For MBO participants, amounts reported under "event fees" were modified based on information provided by the event organizer. A few outliers were removed, based on expenditure per person per day being unrealistically high. Results are rounded in the following tables, but calculations were made using all available decimal places.

Average expenditure per person per day was \$99, weighted equally across all four events. For comparison, the average summer visitor to Bend in 2012 spent \$96 per person per day. The average, inflation adjusted to 2012, for participants in the 2009 and 2010 USA Cycling Cyclocross National Championships was \$78 and \$64, respectively.

Figure 1 shows expenditure by category. Mountain Bike Oregon is a self-contained tour, similar to Cycle Oregon, such that the event fee is unusually high and lodging and restaurant expenditures are low. Likewise, tour expenditure is unusually high for Cog Wild participants.

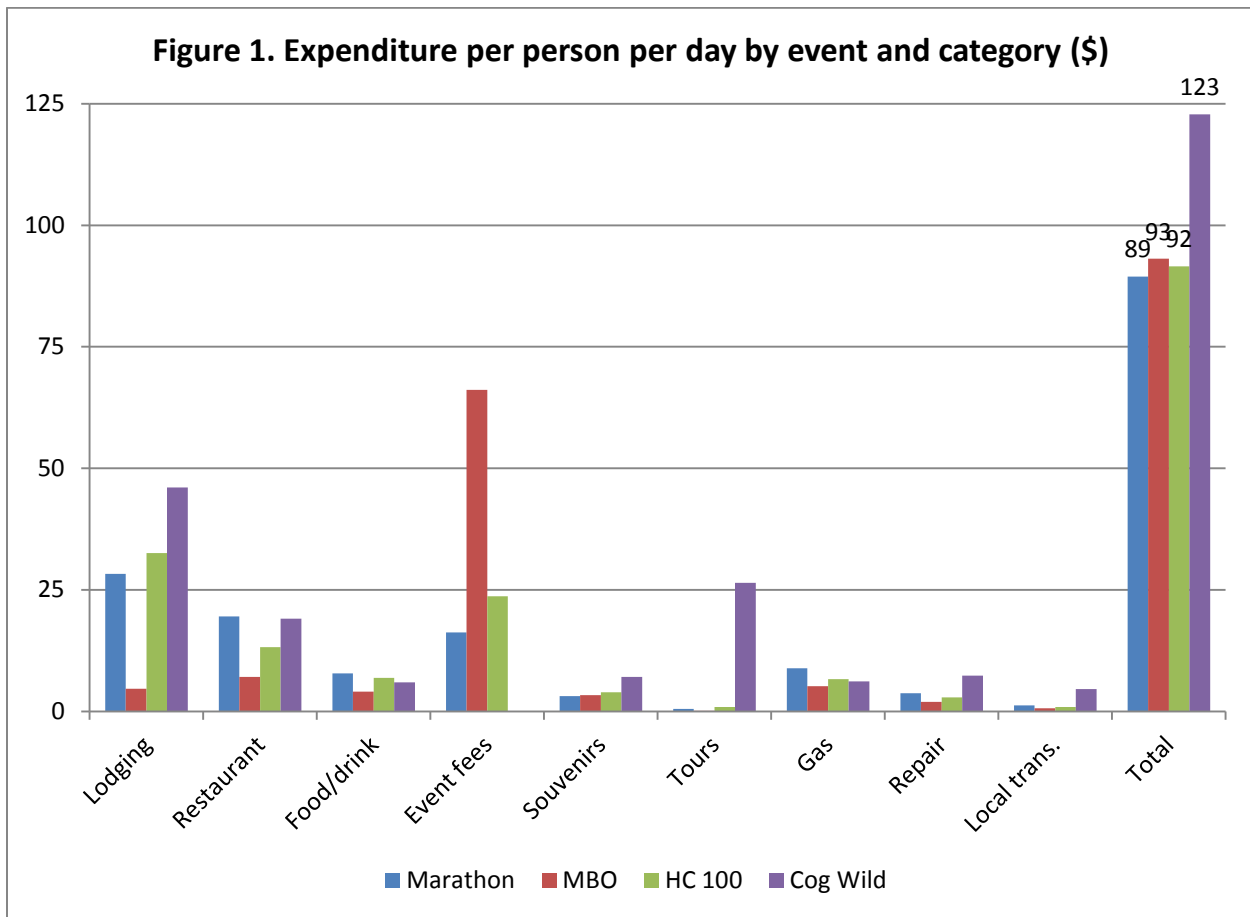


Table 2 shows number of participants and associated expenditure, by event. The proportion of all participants that is non-local is based on the distribution of local and non-local survey respondents for each event. MBO had by far the largest number of participants, while Cog Wild had the largest expenditure per party. MBO generated the largest total expenditure, of \$1.2 million.

	Participants			Expenditure			
	Total	Non-local		Per person per day	Person days per party	Expenditure per party	Total expenditure
Marathon	243	238		89	10	900	213,200
MBO	1,015	1,015		93	13	1,210	1,231,200
HC 100	320	316		92	13	1,230	389,600
Cog Wild	480	456		123	14	1,680	765,400

Expenditure for each event was “run” through the IMPLAN input-output model to estimate “multiplier effects” of money flowing through the local economy. For example, assume that a participant eats lunch at Restaurant X. In order to provide the lunch, Restaurant X hires (and pays) employees and purchases food that is then prepared for customers. Food is an input purchased from another business, and this process generates indirect effects. Wages paid to employees generate induced effects, because those employees spend a portion of their income

in the local economy (perhaps by eating at Restaurant Y or shopping at Supermarket Z). The appendix provides details on analysis steps and input-output analysis assumptions.

There are 440 IMPLAN sectors, of which 283 are present in Lane County and 245 are present in Deschutes County. Table 3 shows the percentage of sectors, in the respective county, that is affected by each event. For example, the HC 100 generated sales in 97% of the IMPLAN sectors in Deschutes County. It generated at least \$1,000 in sales in 24% of the county's sectors.

	Sector's sales are affected at measurable level	Sector's sales are increased by at least \$1,000
Marathon	97%	17%
MBO	97%	30%
HC 100	97%	24%
Cog Wild	97%	33%

Table 4 shows expenditure and three impact measures for each event, measured to the nearest \$100. Sales only includes the margin portion of retail sales; the wholesale cost of retail products is not included, as that is quickly "lost" by the region to pay for products manufactured elsewhere. Labor income includes employee compensation (including wages, salaries, and benefits) and proprietary income (including self-employment income). Employment is full-time or part-time jobs (not full-time equivalents).

Tables 5 through 8 detail the impacts by sector. As one would expect, most of the economic impact accrues to the accommodation and food services sector. However, the multiplier process means that initial spending in a relatively narrow range of sectors (hotel, restaurants, retail, etc.) generates impacts throughout the economy.

Note that MBO is a special case, as event fees covered much of the food and lodging. Most MBO event fees were allocated to IMPLAN sector 410 (Other amusement and recreation industries), which includes guide services. This appears in NAICS sector 71 in Table 6. A portion was allocated directly to the campground sector within NAICS 72.

The ratio between labor income and employment can vary widely across and within the broad NAICS groupings used in Tables 5 through 8. This is due to variability across sectors within the groupings, with respect to salary and part- versus full-time employment.

	Expenditure	Sales	Labor income	Employment
Marathon	213,200	309,700	91,200	4
MBO	1,231,200	1,686,300	647,900	26
HC 100	389,600	608,500	168,900	9
Cog Wild	765,400	1,084,000	388,500	13

Table 5. Total economic impact of the Marathon in Deschutes County, 2012 dollars (employment in jobs)			
	Sales	Labor income	Employment
11 Ag, Forestry, Fish & Hunting	0	0	0.0
21 Mining	0	0	0.0
22 Utilities	5,300	700	0.0
23 Construction	3,300	1,700	0.0
31-33 Manufacturing	1,600	200	0.0
42 Wholesale Trade	2,500	800	0.0
44-45 Retail trade	20,800	9,300	0.3
48-49 Transportation & Warehousing	5,700	2,600	0.1
51 Information	12,600	3,900	0.1
52 Finance & insurance	17,800	4,500	0.1
53 Real estate & rental	23,500	1,500	0.1
54 Prof., scientific & tech. services	15,300	6,300	0.1
55 Management of companies	1,300	500	0.0
56 Administrative & waste services	9,200	4,700	0.1
61 Educational services	1,700	700	0.0
62 Health & social services	9,800	5,500	0.1
71 Arts- entertainment & recreation	50,300	3,600	1.3
72 Accommodation & food services	120,900	40,000	1.6
81 Other services	4,200	2,500	0.1
92 Government & non NAICs	3,900	2,200	0.0
Total	\$309,700	\$91,200	4.2

**Table 6. Total economic impact of the MBO in Lane County,
2012 dollars (employment in jobs)**

	Sales	Labor income	Employment
11 Ag, Forestry, Fish & Hunting	100	0	0.0
21 Mining	0	0	0.0
22 Utilities	5,100	600	0.0
23 Construction	11,000	5,500	0.1
31-33 Manufacturing	4,100	800	0.0
42 Wholesale Trade	17,400	5,800	0.1
44-45 Retail trade	99,200	44,000	1.6
48-49 Transportation & Warehousing	25,300	10,600	0.3
51 Information	26,300	8,400	0.1
52 Finance & insurance	54,700	13,200	0.3
53 Real estate & rental	135,400	7,700	0.6
54 Prof., scientific & tech. services	52,900	21,700	0.6
55 Management of companies	12,400	5,500	0.1
56 Administrative & waste services	40,100	20,400	0.7
61 Educational services	8,200	3,500	0.2
62 Health & social services	73,800	40,000	0.8
71 Arts- entertainment & recreation	877,100	373,500	17.3
72 Accommodation & food services	199,200	64,500	3.0
81 Other services	24,900	13,400	0.4
92 Government & non NAICs	19,100	8,700	0.1
Total	\$1,686,300	\$647,900	26.3

**Table 7. Total economic impact of the HC 100 in Deschutes County,
2012 dollars (employment in jobs)**

	Sales	Labor income	Employment
11 Ag, Forestry, Fish & Hunting	0	0	0.0
21 Mining	100	0	0.0
22 Utilities	10,100	1,300	0.0
23 Construction	6,400	3,300	0.1
31-33 Manufacturing	2,800	400	0.0
42 Wholesale Trade	4,400	1,500	0.0
44-45 Retail trade	34,400	15,500	0.6
48-49 Transportation & Warehousing	9,200	4,100	0.1
51 Information	25,700	8,100	0.1
52 Finance & insurance	39,100	10,100	0.2
53 Real estate & rental	45,600	3,000	0.2
54 Prof., scientific & tech. services	31,900	13,200	0.3
55 Management of companies	2,400	900	0.0
56 Administrative & waste services	19,700	10,000	0.3
61 Educational services	4,000	1,700	0.1
62 Health & social services	18,200	10,200	0.2
71 Arts- entertainment & recreation	130,400	9,100	3.5
72 Accommodation & food services	208,200	67,200	2.5
81 Other services	8,200	4,900	0.1
92 Government & non NAICs	7,600	4,300	0.1
Total	\$608,500	\$168,900	8.5

Table 8. Total economic impact of Cog Wild in Deschutes County, 2012 dollars (employment in jobs)			
	Sales	Labor income	Employment
11 Ag, Forestry, Fish & Hunting	100	0	0.0
21 Mining	200	0	0.0
22 Utilities	21,300	2,700	0.0
23 Construction	12,500	6,300	0.1
31-33 Manufacturing	5,800	800	0.0
42 Wholesale Trade	10,100	3,400	0.1
44-45 Retail trade	74,700	33,900	1.3
48-49 Transportation & Warehousing	37,100	18,500	0.7
51 Information	40,300	12,400	0.2
52 Finance & insurance	41,400	8,700	0.2
53 Real estate & rental	83,000	5,400	0.4
54 Prof., scientific & tech. services	45,300	18,600	0.4
55 Management of companies	4,500	1,700	0.0
56 Administrative & waste services	27,500	13,500	0.4
61 Educational services	3,400	1,600	0.1
62 Health & social services	41,300	23,100	0.4
71 Arts- entertainment & recreation	172,100	81,600	3.1
72 Accommodation & food services	432,600	139,800	5.3
81 Other services	16,400	9,500	0.2
92 Government & non NAICs	14,400	7,000	0.1
Total	\$1,084,000	\$388,500	13.0

Appendix

The following steps were used to estimate the multiplier effects of mountain bike event expenditure.

1. Separate IMPLAN models were created for Deschutes County (Marathon, HC 100, and Cog Wild) and Lane County (MBO), with 2011 economic structure data.
2. IMPLAN default values were used and Type SAM multipliers were created. These multipliers treat households as endogenous and thus include induced effects.
3. An impact scenario was created by allocating visitor expenditure into relevant IMPLAN categories (bridging). Spending in the retail food/drink, other shopping, gas, and bike repair categories was treated as retail expenditure and margined.
4. Impact estimates were generated. Impact results are shown in 2012 dollars. The IMPLAN model was estimated in disaggregated form with all 440 IMPLAN sectors, but results are grouped into broad sectors based on the 2-digit NAICS classification.²

Input-output analysis assumptions

IMPLAN is based on input-output (IO) analysis and is widely used to estimate the economic effects of tourism, recreation, and other activities. The IO approach involves several assumptions. These assumptions generally are not met in their entirety, but IO (and IMPLAN in particular) provides a good balance between practicality and accuracy. That is particularly true in cases, such as the present, in which the impact being evaluated is a small proportion of the overall study area economy. In such cases, non-linearities can be reasonably approximated with the linear relationships inherent in IO. IO assumptions include the following.

1. All businesses within each sector produce a single, homogeneous product or service; the input procedures used in the production process are identical.
2. An increase of production will lead to purchase of inputs in the proportions shown in the technical coefficients matrix. In technical terms, the production function is linear and homogeneous. This assumption restricts economies of scale; IO analysis assumes a business always will use the same proportion of inputs regardless of how much it grows.
3. When households are included in the analysis (as is done for this analysis), their spending patterns (consumption functions) also are assumed to be linear and homogeneous.
4. The structure of the economy will not change. Many input-output models, including the one used here, are static in nature. They are based on data from a single year (in this case 2011) and yet are used to estimate significance in other years (2012). Dramatic structural changes in the economy would invalidate this assumption.
5. When IO is used to estimate the effect of changes in final demand (as in the present case), there must be unemployed resources available to be brought into the sector as inputs.

² See http://www.naics.com/naicsfiles/2012_NAICS_Changes.pdf for category descriptions. NAICS is the North American Industry Classification System, a system for classifying economic activity into categories.

About the Author

Professor Kreg Lindberg is the author of this report. Lindberg has more than 20 years of experience in the field of tourism and outdoor recreation, including extensive work in economic valuation and impact. Lindberg has published multiple articles in leading academic/research journals, including *Annals of Tourism Research*, *Journal of Leisure Research*, and *Forest Science*.

Lindberg has a Ph.D. in forestry from Oregon State University (OSU), with a focus on tourism and recreation and a minor in economics. He is an associate professor in the Tourism and Outdoor Leadership program at the OSU Cascades Campus in Bend. He teaches courses in eco and adventure tourism, research methods, data analysis, sustainability, and park management.

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