ARCC
ARKANSAS RIVER
CONSERVATION COOPERATIVE

ECONOMIC VALUE ANALYSIS

For Arkansas River Outfitters
Prepared for the Arkansas River Conservation Cooperative

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Preface

This report is the second in a series of three studies commissioned by the Arkansas River Conservation Cooperative (ARCC). The first study, published in early 2022 (available online at paceyecon.com), quantified the economic and fiscal value the Arkansas River commercial outfitter industry provided to their communities in 2020 – totaling $50 million of value to the state of Colorado. It also noted its relative contributions to various county industry sectors, including amusement and outdoor recreation, lodging, and food, among others. The first report included a section describing the background and basic characteristics of the Arkansas River commercial outfitters and reflected on many of the qualitative benefits attributable, in part, to their presence in the community, with the last section of the report noting further research to be addressed in this series of studies.

With the availability of both the 2021 and 2022 data, this second report provides a trend for the past three years and a more thorough analysis of the economic and fiscal contributions driven by the Arkansas River commercial outfitters. Data provided by the Arkansas Headwaters Recreation Area (AHRA) allowed for estimates of the economic value associated with private boaters, plus insights into the value provided to outfitters, visitors, and the community when water flow on the Arkansas River is augmented for recreation. This follow-up study continues to utilize IMPLAN, an input-output model that is widely accepted and highly regarded in both the private and public sectors.

Introduction

This report, the second in a series of three studies for ARCC, continues to identify, measure, and address:

- the direct spending from visitors choosing a commercial whitewater rafting, kayaking, or fishing trip on the Arkansas River where these expenditures include the purchase of a river trip, lodging, food, gas, on-site retail, and photography
- how visitor spending impacts employment, labor income, value-added, economic output, and tax receipts to and for their communities
- the specific economic and fiscal benefits to Chaffee and Fremont counties plus the benefits to surrounding counties in the Pikes Peak Wonders region and the state of Colorado
- a preliminary review of the additional value associated with private boat activity in the Pikes Peak Wonders region
- the potential benefits to visitors, outfitters, and the community from a water flow program providing an economically efficient and exciting experience for river recreation
- the many qualitative benefits generally associated with having a vibrant and healthy natural resource in one's community and its role in attracting other special events or positive attributes to the area

The economic value from other potentially quantifiable benefits derived from other outfitter adventures and/or backpacking, camping activities, groceries, etc. in addition to other local attractions such as the Royal Gorge, scenic train, zip lining, etc. are not measured in this report.

Importantly, an economic value analysis (or visitor spending effect) is not quite the same as an economic impact study, as the former measures the economic benefits associated with all visitor spending while an economic impact study measures only non-local and/or out-of-state spending. However, this report does identify the percentage of in- and out-of-state visitors, finding the majority (approximately 75%) of visitors are from out-of-state. Most in-state visitors (nearly 90%) travel from the Front Range cities.

The Executive Summary below illuminates our key findings and is followed by:

- an explanation of the methodology and the "multiplier" effect
- a three-year history of the direct visitor expenditures and the resulting economic and fiscal benefits to the Arkansas River communities and surrounding counties
- an ongoing overview of the outdoor recreation industry and key descriptive statistics of Chaffee and Fremont counties
- the addition of information on private boating usage on the relevant portions of the Arkansas River in the Pikes Peak Wonders region and its potential economic value
- the relationship between water flow and river usage and its potential value to visitors, outfitters, and communities
- a continued discussion of some of the qualitative benefits likely derived from the Arkansas River

Executive Summary

The number of visitors participating in an outfitter trip dramatically increased from 2020 to 2021, likely due to pent-up demand from the pandemic, while in 2022 visitor levels returned to the more typical levels, somewhat higher than in 2020. The total number of visitors participating in an outfitter trip each year is as follows:

- 2020: 182,000 visitors generating $50 million to the Colorado economy*
- 2021: 256,700 visitors generating $75 million to the Colorado economy*
- 2022: 196,100 visitors generating $61 million to the Colorado economy*

**Total dollar figures account for the aggregated impact with the multiplier effect applied (i.e., accounting for the re-spending of initial direct expenditures).*

Direct expenditures are monies individuals spend that can be directly tied to their participation in an outfitter trip (purchase of the trip, likely food expenses, lodging, transportation expenses, etc.). These expenditures are how visitors' monies are initially injected into the local economy. The direct visitor expenditures, while recreating with a licensed commercial outfitter[1] on the Arkansas River over the 2020-2022 seasons, are identified by category below in Table I:

Regional Direct Expenditures by Category ($ in millions)

Category	2020	2021	2022
Outfitter Trips	$15	$22.4	$18.9
Food	$4.5	$9.6	$7.4
Lodging	$6	$8.6	$6.6
Gasoline		$2.8	$2.6
Onsite Retail Sales	$1.5	$2.2	$1.9
Photography	$1	$1.6	$1.2
Total	$28	$47.2	$38.6

[1] Outfitters provide various boating trips, including whitewater rafting, kayaking, or angler/fishing trips. In this report, the term 'outfitter trips' refers to whitewater rafting, kayaking and angler excursions on the Arkansas River.

Not surprisingly, as visitors increase or decrease by year, so too do the direct expenditures. That noted, visitor purchases for a trip from an outfitter on the Arkansas River will naturally include the other direct expenditures noted in Table I, where these revenues become an infusion of income into the local economy, creating a chain of economic activities in which total economic contribution is greater than the initial purchases and, when incorporating these direct expenditures, result in:

Regional Direct Expenditures, Output, and Employment ($ in millions)

Year	Direct Expenditures	Total Output	Full-Time Equivalent Jobs
2020	$28.0	$41.1	455
2021	$47.2	$61.2	617
2022	$38.6	$49.4	498

Clearly, maintaining the operations and stability of the Arkansas River outfitters is important as they are responsible for infusing $50 to $60 million into the local economy, and sustaining some 450 to 600 full-time equivalent jobs.

Our research finds in previous years Chaffee and Fremont counties had a similar share of the outfitter visitor market and value contribution to the region. However, in 2021 and 2022 Chaffee County has captured a larger share of these visitors—shifting from approximately a 50-50 split in visitors between the two counties to closer to a 60-40 split of visitors and revenues.

Furthermore, preliminary estimates of private boating data indicate at least 20,000-day visitors, generating an additional $1.2 million contribution from summer Arkansas River activity, that is not included in this analysis.

Given the reality that outfitter trips are primarily a seasonal activity over the summer months, these visitor spending dollars account for a substantial portion of the economic and fiscal well-being of their communities.

Another important contribution to this 2023 report is our analysis of water flow on outfitter operations and its associated economic contributions. Recreational flows help keep costs down for outfitters, resulting in lower prices for visitors, increased visitor numbers, and increased economic traffic and value for local communities.

Outfitters, along with other outdoor recreation activities, provide many other qualitative benefits to their local communities such as public health, air quality, improved property values, etc.

Furthermore, outfitter trip activities are a non-consumptive use of water — they do not compete for water that would otherwise go to local communities or towards other critical purposes like farming, etc.

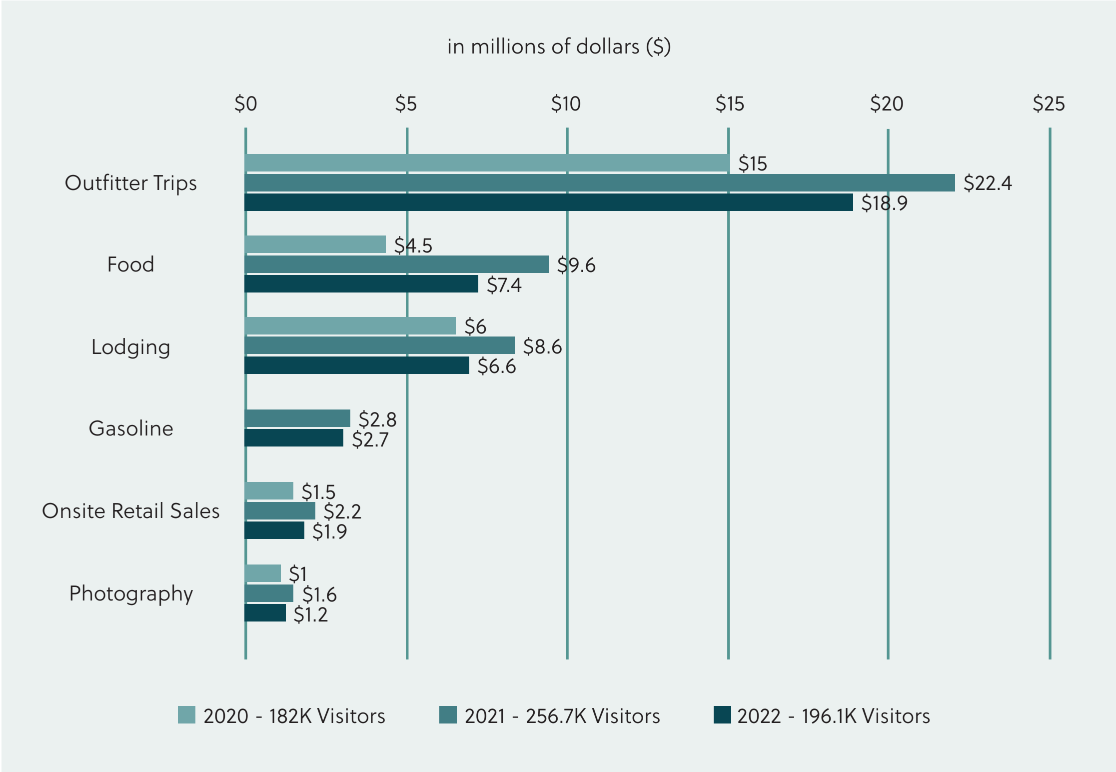
This study continues to support the initial findings that commercial outfitters on the Arkansas River have a large economic footprint in their regional and local economies, which is especially remarkable considering their season, is less than one-third of the year.

Methodology and the Multiplier Effect

As with the first study, the direct monies spent by visitors for the purchase of a commercial rafting trip on the Arkansas River plus expenditures for imaging/photographs or on-site retail purchases for items such as T-shirts, hats, sunscreen, sodas, etc., are available by company.[2] In addition to these expenditures, visitors make other purchases for lodging, food, and gas, which was determined using standard survey techniques, which are then cross-checked to ensure these estimates are consistent with the findings of other studies and surveys in the outdoor recreation and/or hospitality industries within Colorado.[3] Regional direct expenditures by category for the years 2020 through 2022 are identified below in Chart I:

CHART I

Visitor Expenditures for an Outfitter Trip



[2] Limited retail data was available by company, and data available was considered to be a representative sample of all outfitters

[3] A list of other outdoor recreation and/or hospitality studies reviewed in the preparation of this report can be found in Appendix D to this report

Once the direct expenditures are made, much of these monies are then re-spent within the area for labor and supplies. This re-spending of the direct visitor-related revenues creates secondary benefits also known as indirect and induced effects. These secondary benefits are commonly referred to as the "multiplier effects" as these dollars grow into multiple additional dollars for their communities.

For example, monies spent on food at a restaurant will be used to purchase goods, cover operating expenses, pay employees, etc., in turn supporting a variety of other businesses and individuals across many different industries as those monies trickle through the local economy. That is, these payments have substantial "ripple" or "multiplier" effects where one visitor's spending at an outfitter becomes someone else's income and spending in the community, be it a worker or an employer. Note, these multiplier effects vary substantially across industries—money spent at a restaurant will have a quite different path of travel than money spent at a hotel.

The visitor spending effects result in many benefits to the community in the form of extra jobs (employment), labor income, and the value-added to the community from these jobs and income, plus the additional output and tax revenues for the communities. The chart below provides a brief explanation of each economic measure and notes their 2020 to 2022 values derived strictly from the benefit of the initial visitor spending on outfitter trips.

Employment

The level of full-time equivalent jobs created by the expenditures on outfitter trips and subsequent effects

- 2020: 455 full-time equivalent jobs created
- 2021: 617 full-time equivalent jobs created
- 2022: 498 full-time equivalent jobs created

Labor Income

A component of value-added that measures the portion of newly created value that is employee compensation and self-employment income required to produce or sell the additional goods and services.

- 2020: $17.3 million dollars in labor income created
- 2021: $20.5 million dollars in labor income created
- 2022: $16.7 million dollars in labor income created

Value Added

Includes only "additions" to the economy i.e., newly created goods and services resulting from expenditures on outfitter trips.

- 2020: $26.8 million dollars in value added to the local economy
- 2021: $34.3 million dollars in value added to the local economy
- 2022: $27.7 million dollars in value added to the local economy

Output

Includes total sales or revenues generated by firms, government, and households, from initial direct expenditures from visitors and subsequent effects.

- 2020: $41.1 million dollars in total output
- 2021: $61.2 million dollars in total output
- 2022: $49.4 million dollars in total output

Taxes

Government revenues from the subcounty to federal level generated by outfitter trips and resultant secondary effects.

- 2020: $9.8 million dollars in total tax revenues generated
- 2021: $12.9 million dollars in total tax revenues generated
- 2022: $10.6 million dollars in total tax revenues generated

Clearly the economic benefits to Chaffee and Fremont Counties and the surrounding Arkansas River communities are quite substantial, the details of which are discussed in the following sections of this report.

Economic Benefits to the Arkansas River Community

In addressing the regional effects, i.e., the communities in the Arkansas River corridor, our study collapses the revenues generated by outfitters outside of Chaffee and Fremont Counties into these two counties, based on their likely revenue participation.[4]

Direct Expenditures by category for the region are reiterated below:

TABLE I

Regional Direct Expenditures by Category ($ in millions)

Category	2020	2021	2022
Outfitter Trips	$15	$22.4	$18.9
Food	$4.5	$9.6	$7.4
Lodging	$6	$8.6	$6.6
Gasoline		$2.8	$2.6
Onsite Retail Sales	$1.5	$2.2	$1.9
Photography	$1	$1.6	$1.2
Total	$28	$47.2	$38.6

The direct expenditures for outfitter trips and photography were easily identifiable from data provided by the AHRA.[5] Survey data collected by Pacey Economics Inc. as well as other surveys performed regarding visitor travel and outdoor recreation in Colorado[6], provided insight into the other categories of direct expenditures, as explained below:

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[4] *90-92% of revenues in Fremont and Chaffee County and the remaining split approximately 60-40 between the two counties based on outfitter location, interviews with outfitters, 2021 and 2022 Season usages, etc.*

[5] *See "Season Summary by Company" for the complete list of 2021 and 2022 outfitters and their revenues, available at, as of this publication date, https://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/RiverOutfitters.aspx.*

[6] *Additional information and sources can be found in Appendix C to this report*

- Our survey data found visitors planned to purchase, on average, one full-service restaurant meal (not including snacks, extra drinks, or grocery items) in the area per day and commit one day to an outfitter trip. The survey of local area restaurants found an average meal cost of $25 (without any alcoholic beverages) which is, again, consistent with several other studies involving recreational activities in the state of Colorado. The second study, as in the first, $37.50 per visitor for food, representing one meal plus snacks and drinks (or alternatively, one and a half meals per visitor).
- Based on the survey data, lodging expenditures in this analysis have been calculated as one night of lodging per group of three individuals with campsites priced at $50 per night and hotel or VRBO/Airbnb priced at $175-$200 per night. These values are weighted to reflect the distribution of visitors where 25% reported staying at a campsite, 63% at a hotel or short term rental, and 12% staying with friends in the area.
- The gasoline expenditures in this analysis have been calculated as three quarters of one tank of gas per group (considered to be three people per survey data), utilizing an average gas tank size of 14 to 15 gallons and average yearly gas prices in Colorado of $3.48 and $4.11 per gallon for 2021 and 2022, respectively.
- The only retail expenditures captured in the analysis are "on-site" monies, i.e., visitor purchases on the outfitter premises for apparel or souvenirs, etc. and are based on a representative sample that found retail revenues to be approximately ten percent of overall outfitter revenues. To the extent visitors make other retail purchases in the area during their stay, the estimate of these retail expenditures understates the full economic value to these communities.

Not surprisingly, these direct expenditures resulted in economic contributions largely concentrated in three main industries in the region: Amusement and Recreation, Restaurants and Other Food,[7] and Hotels and Motels, detailed by year and industry below in Table II:

[7] *"Restaurants and Other Food" incorporates "Full Service Restaurants," "Limited Service Restaurants," and "All Other Food and Drink Places"*

TABLE II

Regional Economic Contributions by Industry ($ in millions)

Industry	2020 Contribution	2021 Contribution	2022 Contribution
Amusement and Recreation	$15.0	$22.5	$18.9
Restaurants and Other Food	$5.5	$11.0	$8.5
Hotels and Motels	$5.6	$8.3	$6.3
All Other Industries[8]	$15.0	$19.4	$15.7
Total	$41.1	$61.2	$49.4

A closer look at the contributions to these three main industries in 2021[9] demonstrates the scale of these contributions, noted below in Table III below:

TABLE III

2021 Regional Industry Impacts ($ in millions)

Industry	Industry Total Output	Economic Contribution	% of Total Output
Amusement and Recreation	$42.5	$22.5	52.9%
Restaurants and Other Food	$219.4	$11.1	5.1%
Hotels and Motels	$45.4	$8.3	18.3%

Outfitter operations are responsible for over fifty percent (52.9%) of total output within the "Amusement and Recreation" industry in the region, nearly twenty percent (18.3%) of output in "Hotels and Motels," and about five percent (5.1%) of total output in "Restaurants and other food" (which is remarkably high given that only one meal and a snack and drink per visitor have been considered attributable to outfitter operations). Importantly, and mentioned earlier, is the recognition this study reflects the economic contribution/effects of the region for the entire year, while the outfitter season is limited to less than a third of the year. Consequently, the economic benefits discussed play an even more important role in their communities, particularly over the critical summer season.

[8] *"All Other Industries" includes hundreds of other industries, including real estate, hospitals, petroleum and natural gas, utility services, etc. not highlighted here*

[9] *Naturally, as direct expenditures in rafting change year to year, contributions as a percent of total output likely change in a similar fashion.*

A Closer Look at Fremont and Chaffee Counties

Most of the commercial whitewater rafting outfitters on the Arkansas river corridor are headquartered in either Chaffee (21) or Fremont (7) counties. The remaining outfitters on the Arkansas River corridor are located in surrounding counties, primarily from Summit, Pitkin and Clear Creek, typically offering day trips, and/or are special use outfitters servicing particular groups, such as Peterson Air Force Base, the U.S. Air Force Academy, the Boy Scouts, etc.; all of which are combined and labeled as "Other" in Charts II and III below. Chart II delineates market share by revenue and county while Chart III reflects market share by number of visitors and county.

In 2021 and 2022, the outfitter revenues generated in Chaffee County of some to 53-54% of the overall outfitter revenues generated in the Arkansas River corridor while outfitters headquartered in Fremont County made up 39-41% of this market, with the remaining 6-7% attributable to the outfitters headquartered in the surrounding counties, as noted on Chart II below. Not surprisingly, a similar pattern is found for the distribution of visitors taking an outfitter trip, noted below on Chart III.

CHART II

Market Share by Revenues

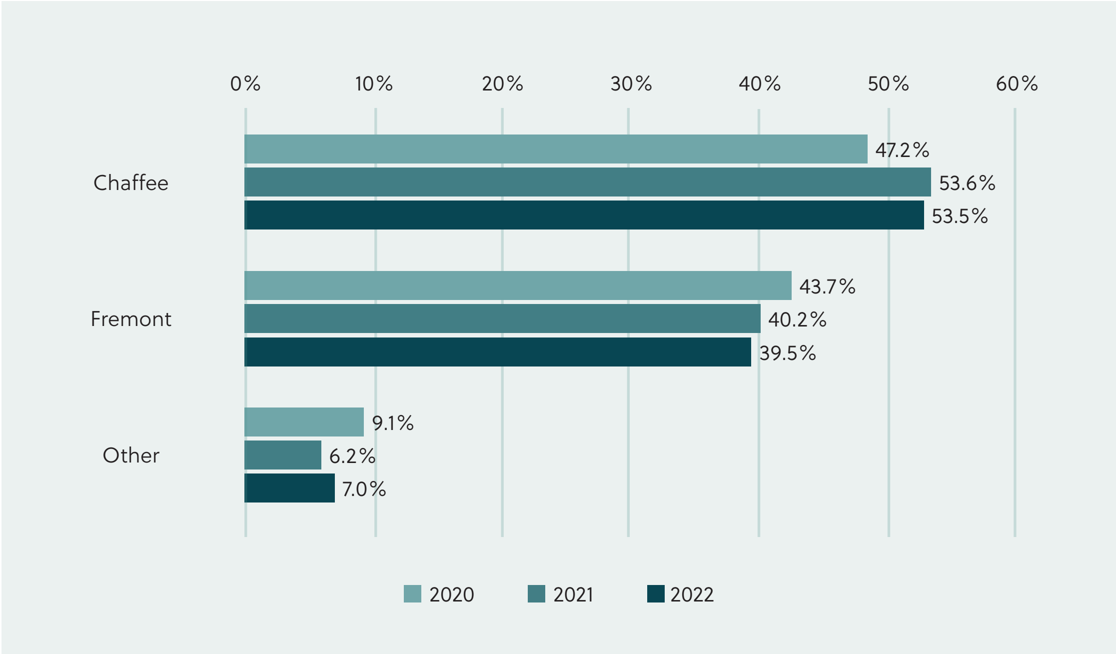
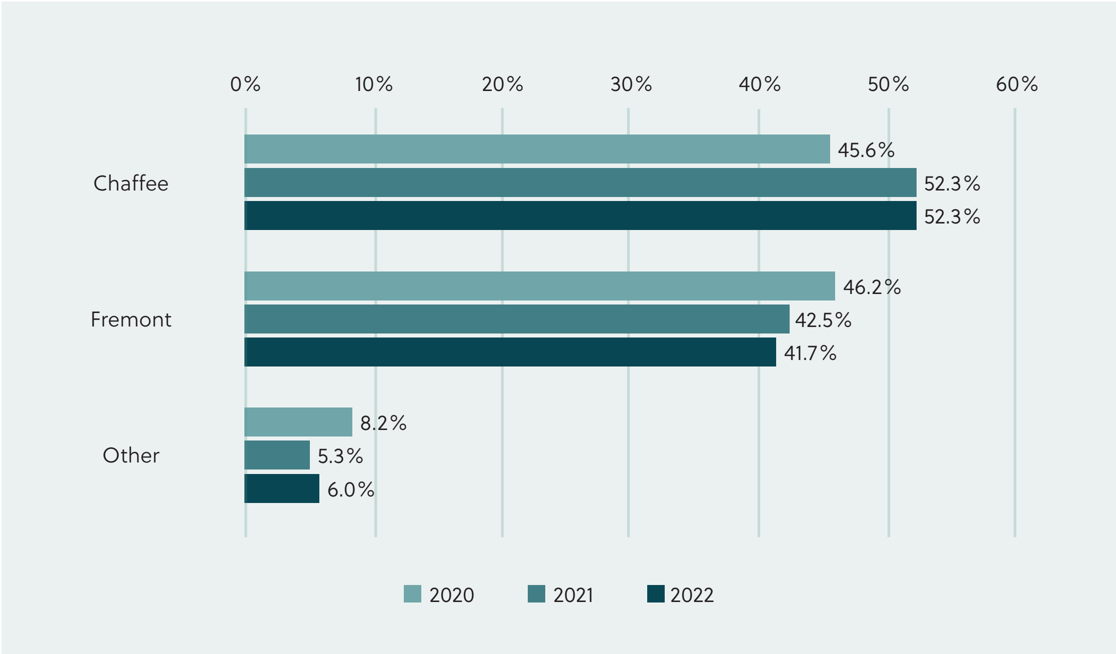


CHART III

Market Share by Visitors



The number of visitors and the corresponding revenues are calculated based on the headquarters of the outfitter's facility.[10] Notably, over the past three years Fremont County's share of both visitors and revenues in the region have been transitioning to Chaffee County and the surrounding other counties. Additionally, outfitters in Fremont County tend to generate fewer dollars per trip, on average, than Chaffee County and the other counties. This is likely due to Chaffee and the other counties having more expensive transportation charges and/or more angler trips (which are more expensive per person on average) and/or more full day trips than offered in Fremont County

There are also some interesting and significant differences in direct expenditures and economic contributions between Fremont and Chaffee counties. Table IV below details the direct expenditures noted on Table I by county; again, where the surrounding counties are split between Chaffee and Fremont by participation area.

[10] One outfitter in particular, River Runners, has two headquarters, one in Chaffee and one in Fremont. As such, their revenues are split proportionate to their level of business: 65% in Chaffee and 35% in Fremont.

TABLE IV

Direct Expenditures by Year, Category, and County ($ in millions)

	2020	2021	2022
Outfitter Trips			
Chaffee	$7.5	$13.4	$11.3
Fremont	$7.5	$9.0	$7.6
Food			
Chaffee	$2.25	$5.80	$4.40
Fremont	$2.25	$3.80	$3.00
Lodging			
Chaffee	$3.0	$5.2	$4.0
Fremont	$3.0	$3.4	$2.6
Gasoline			
Chaffee		$1.7	$1.6
Fremont		$1.1	$1.0
Onsite Retail Sales			
Chaffee	$0.75	$1.3	$1.1
Fremont	$0.75	$0.9	$0.8
Photography			
Chaffee	$0.5	$1.0	$0.7
Fremont	$0.5	$0.6	$0.5
Total			
Chaffee	$14.0	$28.4	$23.1
Fremont	$14.0	$18.8	$15.5

As discussed earlier in this report, visitors and revenues to the region as a whole are split approximately 60-40 between Chaffee and Fremont Counties, respectively, in both 2021 and 2022. As direct expenditures are largely tied to the number of visitors in each county and the survey data noted no major price differentials in lodging, food, or gas across the counties, there is a similar split in each component of direct expenditures.

To analyze each county's contribution to the previously identified three main industries, we have again utilized 2021 as a representative year. Tables V and VI below show Chaffee and Fremont Counties' respective contributions to those three main industries:

TABLE V

Chaffee County Industry Impacts ($ in millions)

Industry	Industry Total Output	Economic Contribution	% of Total Output
Amusement and Recreation	$27.5	$13.5	49.0%
Restaurants and Other Food	$107.4	$6.7	6.2%
Hotels and Motels	$34.3	$5.1	14.9%

TABLE VI

Fremont County Industry Impacts ($ in millions)

Industry	Industry Total Output	Economic Contribution	% of Total Output
Amusement and Recreation	$15	$8.9	59.7%
Restaurants and Other Food	$112	$4.3	3.8%
Hotels and Motels	$11.1	$3.2	28.3%

Clearly, commercial rafting on the Arkansas river is important to both counties, particularly in their "Amusement and Recreation" industry where it makes up a significant portion of industry total output.

The outfitter attraction in Fremont County represents nearly sixty percent (59.7%) of the revenues generated in the "Amusement and Recreation" industry and nearly thirty percent (28.3%) of the revenues generated in the "Hotels and Motels" industry. Outfitter trips make up a smaller, but still significant, percentage of the "Amusement and Recreation" industry in Chaffee County (49%) and approximately half as much as Fremont in the "Hotel and Motel" industry (14.9%).

Chaffee County, however, is more reliant on outfitter attraction in the "Restaurants and Other Food" industry as they represented approximately six percent (6.2%) of industry total output versus Fremont County's approximately four percent (3.8%). It is important to note, this food contribution reflects only one meal and snack per person for just one day of a typical four (4) day visit on the river, with these summer visitors spending similar food monies the other three (3) days, suggesting the overall summer visitor contribution to each county is likely four (4) times that represented by outfitter trips alone.

These differences are likely explained by the off-summer season (i.e., non-summer) attractions to both regions and their respective populations. Chaffee County offers much more for tourists in the off-season than Fremont County, such as skiing, snowmobiling, etc. This difference explains why Fremont is likely more reliant on outfitter operations within the "Amusement and Recreation" and "Hotels and Motels" industries, as outfitter operations are a main attraction for tourists visiting the area. On the other hand, Chaffee County has a much smaller population than Fremont County (approximately half), which would explain why it is more reliant on outfitter operations in the "Restaurants and Other Food" section, as tourists visiting would have a larger impact on food and drink sales in Chaffee County than Fremont County.

All the expected key industry sectors play an important role in generating economic and fiscal benefits to the communities along the Arkansas River corridor—due to the infusion of monies from the decision to take a commercial whitewater rafting, kayaking, or fishing trip.

Again, and importantly, the economic value identified in this study reflects just one day of visitor expenditures for commercial whitewater rafting, kayaking, or fishing expeditions. That is, unlike impact or valuation studies that focus on one-time events (e.g., the Olympics), outfitters on the Arkansas River make ongoing contributions to the businesses in their communities, surrounding communities and the state of Colorado annually.

Other Economic Benefits

Private Recreational Boating

Not included in the initial study are the benefits accruing to the communities from private recreational boating and fishing on the Arkansas River corridor. Colorado Parks and Wildlife (CPW), the recreation manager for the Arkansas Headwaters Recreation Area (AHRA) has a key role in monitoring river flows, important to the outdoor recreational industry, and in the management and operations of park access and sustainability. A study funded back in the early 2000s by the Colorado Water Conservation Board noted the upper Arkansas River to be the most boated whitewater river in the country with over 200,000 commercial rafting guests and approximately 60,000 private boaters per year.[11]

Some of the private boaters (rafters and kayakers) are likely tourists, coming from afar with their own gear and staying in the AHRA park, but many are likely on a day trip given the proximity of the Arkansas River to Colorado's heavily populated Front Range cities. Naturally, these visitors contribute additional economic value, beyond the millions identified in the previous section, to the communities in Chaffee, Fremont, and surrounding counties.

For this follow up report, AHRA provided data collected on weekend days and holidays during the 2020 boating season regarding the number of boaters (rafters and kayakers) along four stretches of the upper Arkansas River. A tabulation of the data is provided in Table VII below:

TABLE VII

Number of Private Boaters on Weekends and Holidays During the 2022 Boating Season

Section	Number of people
Section 1e - Numbers Site to Railroad Bridge	2,715
Section 2b - Fisherman's Bridge to Stone Bridge	6,530
Section 4b - Texas Creek to Parkdale	855
Section 5 - Parkdale to Canon City	1,242
Total	11,342

[11] *PEPO Workgroup Arkansas River Basin. The Voluntary Flow Management Program on the Upper Arkansas River. https://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/Admin/Publications/VFMPInformationalBrochure.pdf*

Using this limited data, this study:

- estimated a minimum of 20,000 private boaters during the 2021 season, substantially below the early 2000s estimate of 60,000
- expected each visitor would purchase one meal at an average cost of $25 per meal;
- and each vessel (be it raft or kayak) would purchase three-quarters of a tank of gas for an average cost of $45

As the analysis did not consider a park fee entrance nor any overnight stay driven by the private boater on a day visit, the total direct expenditures by these visitors amounted to some $965,700, with a resulting output value of $1.2 million, when considering the local economy has approximately a 1.3 multiplier.

The Importance of Water Flow

Water flow on the Arkansas River is critical to the operations of all boaters, commercial or private, whitewater or floating, and low water flow limits or potentially can eliminate the ability to use a river for rafting, kayaking and even fishing. However, water flow, is a complicated issue as it is intertwined with water rights laws, and, likely unbeknownst to many, water flow is not simply the chance of nature, but can and is managed to meet “senior”, “junior” and “beneficial” priority use appropriations. According to a study by Public Education, Participation, and Outreach workgroup (PEPO), funded by the Colorado Water Conservation Board, outdoor recreational use of water is a low priority “beneficial use” but given its in-stream non-consumptive attributes it has had the advantage of sustainability over the years, although not without difficulties.

Several decades ago, local, state, and federal organizations joined together to form the Voluntary Flow Management Program (VFMP), designed to maximize the “beneficial” uses of water on the Arkansas River. The VFMP is credited with extending and helping to stabilize the outdoor boating season on the Arkansas River, which, over the years, has translated into a flourishing outdoor recreation economy, enriching the communities along the Arkansas River corridor.

Achieving flow objectives not only depends upon water availability and water management’s ability to move or store water when and where it is needed, but also requires a “balancing” between the needs of different constituencies, with fisheries in need of low flows and outdoor recreational activity needing greater water flows. Fortunately, because of seasonal differences in needs, much of this can and has been accomplished over the years, although additional predictability in the water flow over the summer season would provide increased benefits to outfitter trip visitors, outfitters, and their communities, for reasons discussed below.

This follow-up study obtained annual water flow data from U.S. Geological Survey’s (USGS) website and tracked this data to the annual AROA visitors on the Arkansas River corridor to evaluate the impact of water flow. Using standard statistical tools finds, not surprisingly, a strong relationship between water flows and rafting visitors. This relationship can be quickly appreciated and depicted in Chart IV below:

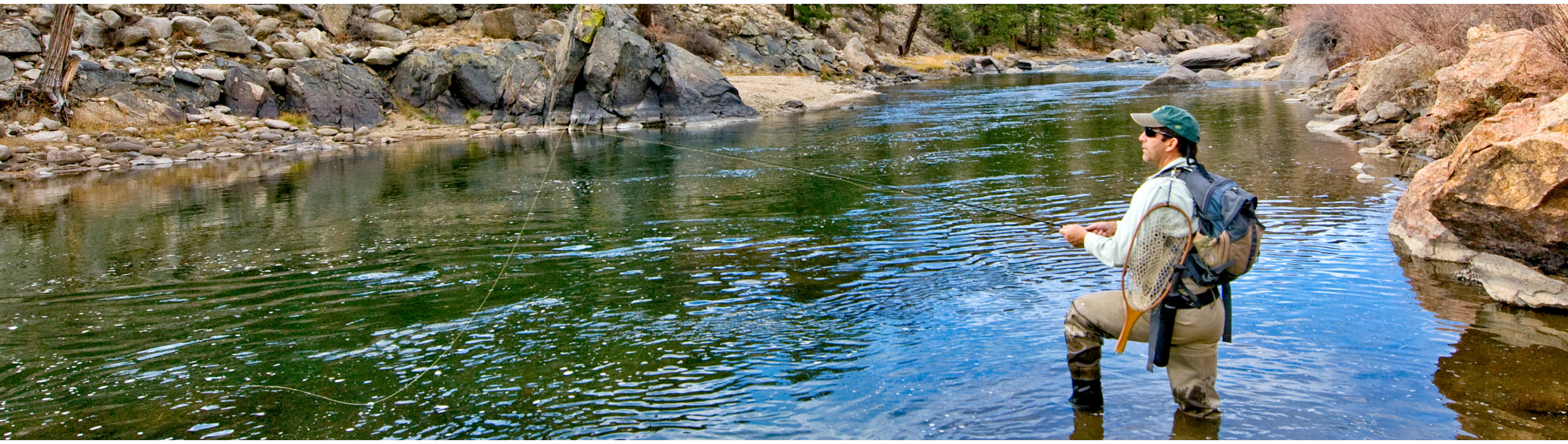


TABLE VII

Waterflow and Boaters

Clearly, in low water flow years, such as 2002 and 2012, rafting visitors are substantially lower, not only reducing revenues to the outfitters, but these lost revenues and their associated multiplier effect also negatively impact the economic well-being in their communities. Low water flows have additional negative consequences as further research, described below, finds it increases the costs of doing business as low water flows require fewer people per raft, which pressures outfitters to increase prices to visitors, which further dampens visitor numbers, and the negative cycle continues.

In addition to annual water flow data, this follow-up study received data providing the daily number of clients and boats for every day of the 2022 rafting season from AHRA as depicted in Chart V below:

CHART V

Waterflow, Total People, and People Per Boat

Analysis of this data reveals, holding constant the total number of boaters per day, when water flows are below 700 cubic feet per second (CFS), the average number of clients per boat was approximately one person fewer than when the CFS was above 700.[12] Thus, in down water years, not only are there fewer visitors, but a greater number of boats and guides per visitor is required due to the low water flow.

Such a difference amounts to an estimated twenty percent (20%) impact on company revenues while not impacting or very slightly impacting their expenses. As the price elasticity of whitewater rafting (and other recreational activities) is estimated by most studies to be approximately one,[13] or "unit elastic"—i.e., if the price increases by ten percent (10%) the quantity demanded (number of visitors) is expected to decrease by ten percent (10%).

Consequently, when water flows are under 700 CFS, it is estimated the cost of doing business is approximately twenty percent (20%) higher than when water flows are over 700 CFS. Thus, with higher water flows, outfitters can keep prices down, as costs are down, allowing for increases in demand (visitors), which provides economic benefits to the visitor, the Arkansas River corridor communities, and the outfitter.

[12] *i.e., a standard linear regression where the outcome variable is people per boat, the variable of interest is CFS, and total boaters per day is used as a control variable.*

[13] *Rosenberger, Randall S., and T. D. Stanley. "Publication Selection of Recreation Demand Price Elasticities: A Meta-Analysis." (2009).*

Qualitative Benefits

Participants on commercial rafting trips enjoy the benefits of a natural resource without consuming it and, as noted earlier in the initial study and in this follow-up report, rafting is on the surface of the river and water loss is minimal. This important qualitative benefit is crucial in a changing climate as the water from the Arkansas River is increasingly vital to other area industries including farms and household consumption. This also implies the commercial rafting industry on the Arkansas River can continue to provide resources and benefits to surrounding communities so long as the water continues to flow.

In addition to the purely economic returns that flow to a community from all the outdoor recreation opportunities in and around the Arkansas River corridor or the Pikes Peak Wonders region, be it whitewater rafting, kayaking, fishing, or other such outdoor recreation activities, are the many qualitative (intangible) benefits providing additional value to the local communities.

The most notable qualitative benefits of outdoor recreation are the use of a natural and limited resource without depleting its availability and its minimal, if any, impact on environmental concerns surrounding air quality, while other benefits include:

- the well-documented positive impacts to mental and physical health, not only improving quality of life but also reducing health costs, etc.
- a key component of the community infrastructure for attracting desired new businesses or enhancing property values for the area
- increased civic pride and community engagement
- expanded opportunities for special events

The Arkansas River Valley offers beautiful landscapes, clean air and water, quiet small-town atmospheres, fantastic recreational opportunities, etc. where visitors can find a retreat and recharge, from often hectic or burdensome responsibilities, and enjoy a bit of peace and tranquility. Medical professionals are in full agreement that outdoor leisure activities help people manage their mental and physical health and enhance their overall wellbeing. Such outdoor activities, leading to improved health, can also lead to lower health care costs in the long run, for that individual, and society.

Access to outdoor recreation can also be leveraged to attract new businesses and employees, as outdoor gear manufacturers have incentive to locate in these areas and attract employees interested in working and playing in an outdoor environment. Indeed, even if sectors are unrelated to the outdoors, market data suggests access to outdoor recreation opportunities are important factors when deciding where to locate a new business. This likely leads to an increase in property value and tax revenues in the area.

The whitewater rafting sector and the outdoor recreation industry in general have a positive impact on the quality of life to its communities as they provide a sense of civic pride, which can lead to more engagement. Community participation lends itself to a better understanding of community needs and desires, to assist its leaders in determining a balance in their efforts to encourage economic activity but also maintain healthy public lands and quality outdoor experiences.

The amalgamation of outdoor recreation activities such as whitewater rafting, kayaking, camping, biking, zip-lining, scenic tours, etc. are a catalyst for increased events and exposure such as spring, summer or fall festivals, weddings, family reunions, etc. Such events can be coordinated around the high summer season and media exposure and promotion utilized to fill existing capacities and/or expand the opportunities for other area businesses.

Properties near outdoor recreational facilities allow for easier access but also likely leads to an increase in property value and property tax revenues in the area. That is, as more people move closer to outdoor recreational areas, then support businesses will be attracted to the area, which will require infrastructure development, employees, etc. all of which leads to additional economic value and benefits.

Industry Background and Summary Statistics

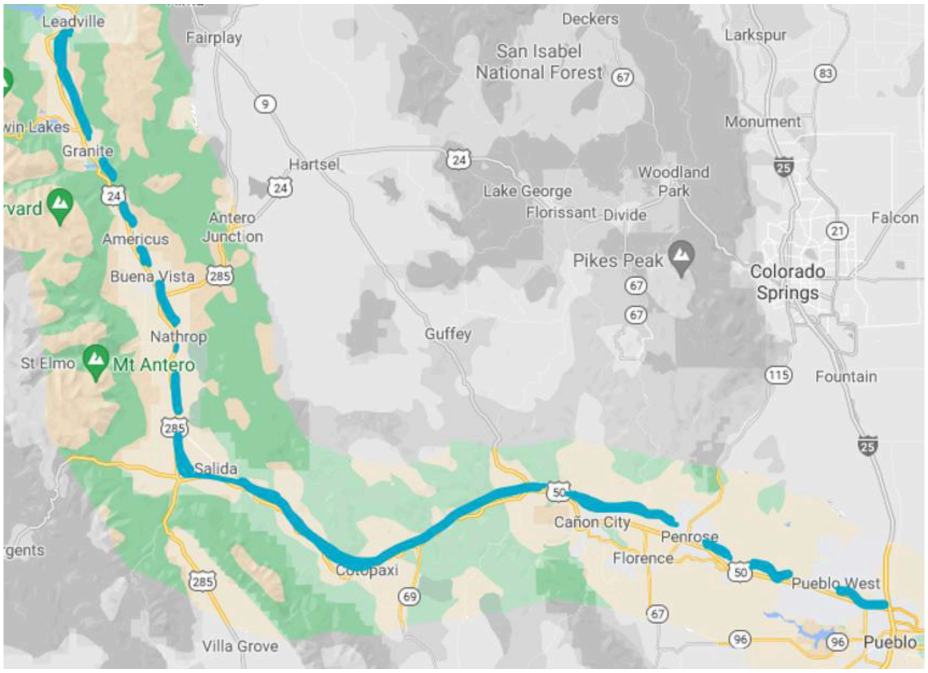
Geography

The section of the Arkansas River servicing the rafting, kayaking, fishing, etc. encompasses a 152-mile stretch located within Lake, Chaffee, Fremont, and Pueblo counties (i.e., from Leadville to Pueblo) and is within the confines of the Arkansas Headwaters Recreation Area (AHRA), one of forty-two Colorado recreation areas managed by Colorado Parks and Wildlife (CPW).

AHRA is recognized as one of the nation's most popular whitewater rafting and kayaking locations, the most commercially rafted river in the U.S., in addition to providing world-class angling. Below is a map outlining the Arkansas River corridor within the Pikes Peak Wonders region.

FIGURE 2

Arkansas River Corridor and Pikes Peak Wonders Region



Governance

CPW has a cooperative partnership with the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) and governs many different aspects of the Arkansas River corridor, including recreation facilities and river access sites, commercial launch windows and outfitter permits, and the regulation of boating (private and commercial) capacities. CPW is headquartered in Salida, Colorado and in addition to oversight of AHRA, an outdoor recreational area for visitors, the focus of the professional staff is on improving environmental practices through research and technology.

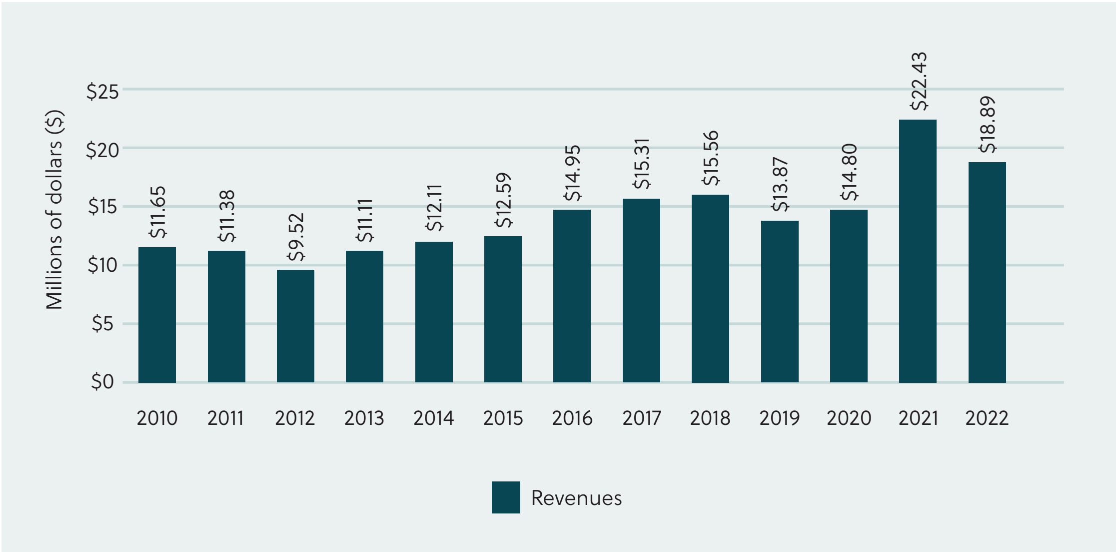
The Arkansas River Outfitters Association

The Arkansas River Outfitters Association (AROA) consists of professionals offering outdoor recreation on one of the most popular rivers for rafting in the United States, Colorado's Arkansas River. Approximately two-thirds of the commercial outfitters on the Arkansas River, permitted through CPW, are members of AROA; however, AROA members account for some 90% of both visitors taking boating trips, including fishing trips, and associated revenues. AROA's members offer a wide range of whitewater experiences for all ages and adrenaline levels throughout the summer season, from late April to early September, and provide safe service and protocols for a memorable adventure, whether it is a rafting, kayaking, or fishing expedition.

Another interesting characteristic of this sector of outdoor recreation is its growth in popularity, measured by annual revenues generated. As noted below, in Chart VI, revenues increase from a low of $9.5 million in 2012 to a new peak of $22.4 million in 2021, then falling slightly in 2022 though remaining above the long-run average and trend. The large increase in 2021 (some $7.6 million or 51.4%) is likely attributable to the COVID-19 pandemic, as pent-up demand from the first year of the pandemic was likely reflected in the following year as pandemic restrictions eased and consumers travelled and recreated more. The decrease in 2022 was likely an easing of this pent-up demand but also inflationary issues peaked that year, though it should again be noted 2022 revenues were well above the long-run average and trend, indicating some real growth in outfitter trip demand.

CHART VI

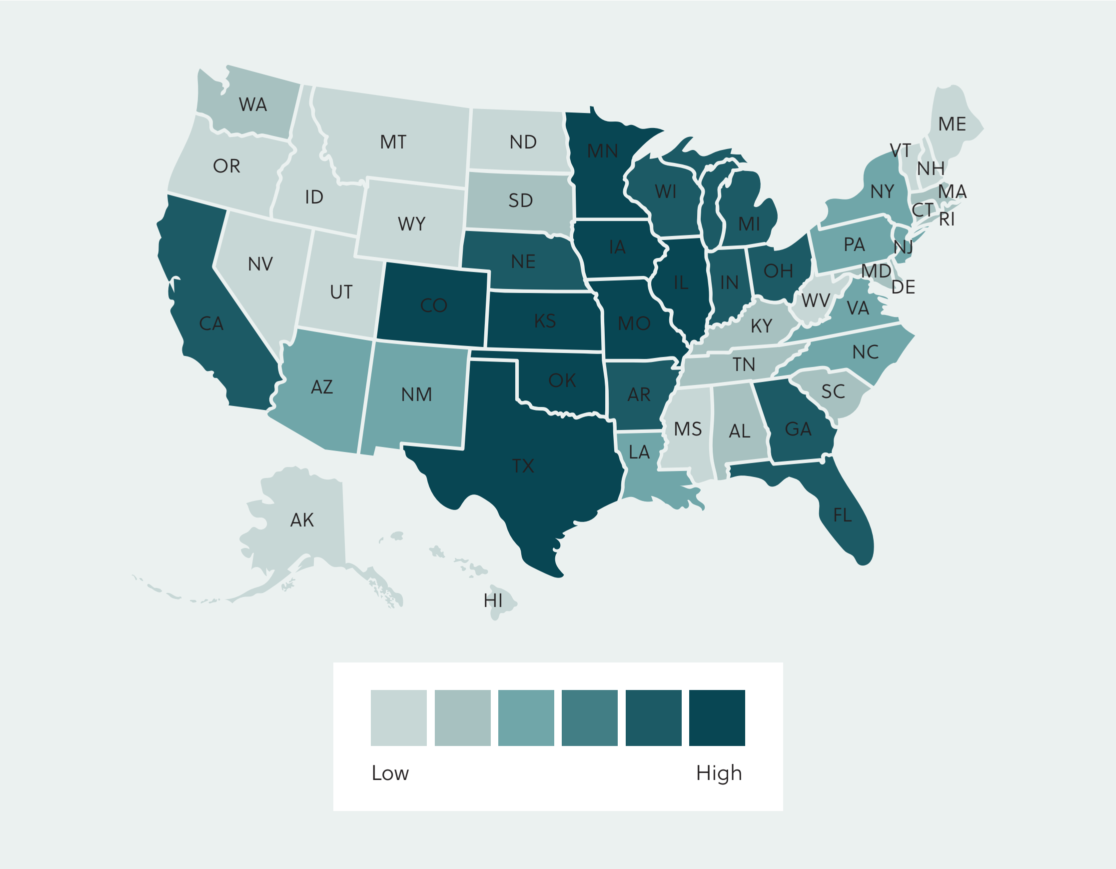
Revenues by Year



Demographics

An estimated seventy-five percent (75%) of visitor trips on the Arkansas River travelled from outside of Colorado (i.e., out-of-staters) with the heaviest influx out of the Midwest, traveling from Minnesota down to Texas with the Northern Midwest and populous states of California and Florida drawing many visitors as well, as noted on the map below. This distribution is quite consistent with the out-of-state visitor trend for the state of Colorado and may simply suggest those summer visitors travel to various attractions across the state on their stay in Colorado.[14] The map below offers a visual understanding of the geographic regions of travelers attracted to this area. Although all visitors, both out-of-state and in-state provide benefits to these communities, the out-of-state visitors offer additional benefits to the state, as the monies these visitors spend are extra "infusions" to the overall state economy (e.g., employment, output, etc.). In-state visitors, however, simply shift which regions or counties benefit from the attractions – that noted, outfitters clearly attract economic and fiscal benefits to their communities.

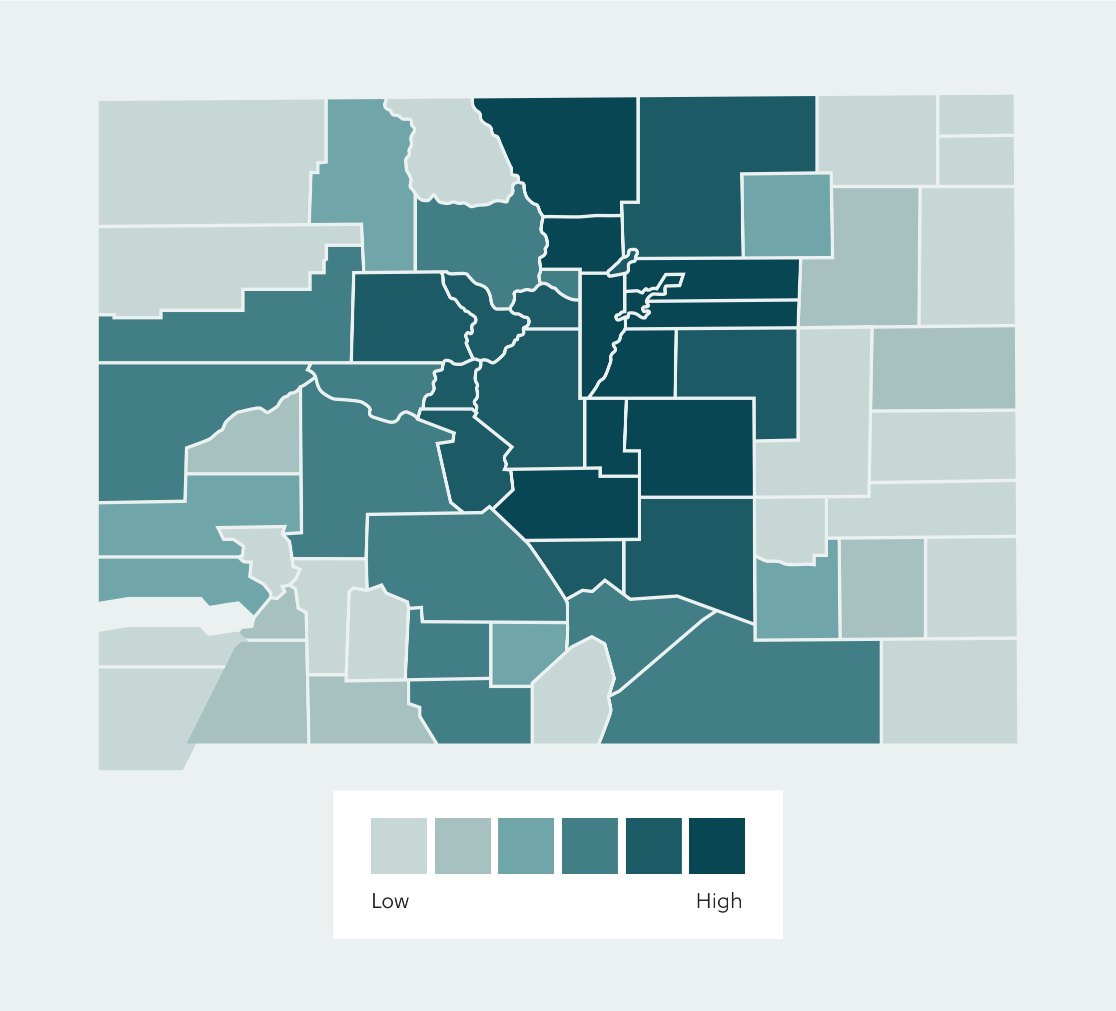
Visitors by State, 2020



[14] *See Longwoods International Colorado Travel Year 2019 report.*

The remaining 25% of rafting visitors taking an outfitter trip reside in Colorado. Indeed, these monies and their multiplier effect matter as well, especially to the local communities as these attractions keep the expenditures within the state but redistribute monies to the communities along the Arkansas River corridor, adding value to their communities and limiting "leaks" out of the state. Not surprising, the county map of Colorado, noted below, finds a heavy concentration of visitors coming from the Front Range communities. Specifically, over 90% of visitors come from the Front Range with half travelling from the Denver metropolitan area.

Visitors from Colorado by County, 2020



Visitors purchasing an outfitter trip are also required to pay a "user fee" to AHRA which helps support the recreation area and water resources. Further, as noted throughout this report, these attractions also generate the need for hotel/camping accommodations, food, retail sales, gas, photography, etc. for the local businesses.

Appendix A – The Multiplier

The "multiplier", i.e., the monies derived from the initial expenditure, are measured using the well-known and well-accepted input-output IMPLAN model. The IMPLAN model, first developed by the U.S. Forest Service many decades ago but substantially refined over the years, provides the basic conceptual framework and mathematical processes required to track the economic and physical data moving across businesses and households. IMPLAN software is used by many major government and private sector companies including The U.S. Department of Treasury, Amazon, Mayo Clinic, National Park Services, etc.

IMPLAN recognizes each direct expenditure in its respective industry is unique and therefore triggers a unique cycle of secondary expenditures (indirect and induced effects) and as such, each direct expenditure can result in a different multiplier.[15]

IMPLAN, once provided with the initial expenditures (the direct effect) by category, tracks the flow of dollars through an economy and estimates the magnitude of subsequent rounds of expenditures (the indirect effect), and expenditures by employees (the induced effect). The summation of these three measures (the direct, indirect, and induced effects) is referred to as the total effect and the multiplier effect is calculated by dividing the total effect by the direct effect.[16]

For example, each outfitter pays its employees and vendors, an indirect effect, then its employees and vendors use these monies to purchase food, shelter, gas, personal needs, or the vendor's wages and supplies, etc. (the induced effect).

There are different multipliers for different industries and expenditures as expenditures on lodging trigger different business-to-business transactions that differ from the expenditures on outfitter trips. Revenues garnered from lodging must be spent not only on staff wages but on a unique set of supplies, real estate, etc. Because the outfitter/outdoor recreation industry has different expenditure burdens/business-to-business transactions from the hotel industry, the multiplier effect associated with each respective industry is therefore expected to be different. IMPLAN captures this in its model. More Information regarding the history and technical details of IMPLAN can be found at implan.com.

[15] *Input-output models, such as IMPLAN, are designed to show the interdependencies between different sectors of an economy – showing how an output of one industry may become an input for another. This is accomplished through a Social Accounting Matrix (SAM) framework that captures all industrial and institutional (including household and governmental) transactions in a local economy. The SAM traces the flow of dollars from purchasers to producers while also accounting for taxes paid by households and business.*

[16] *The direct, indirect, and induced effects resulting from monies paid by visitors/tourists to outfitter operations where these expenditures are noted on the IMPLAN data tables in Appendix A.*

The initial transactions or expenditures, by category, are incorporated into the IMPLAN model which determines where the monies flow and then tracks the subsequent transactions and ultimately identifies the associated employment, labor income, value-added and economic output to the counties and the corresponding tax effects, and the impacts on other industry sectors in the counties, as discussed in the text of this follow-up report.

As discussed above, the benefits from visitors to these outfitter operations reach well beyond their own pocketbook as monies paid to the outfitters are then used to pay employees, rents, utilities, supplies, etc.[17] The graphic on the following page demonstrates how these monies flow and permeate other economic sectors, creating the "multiplier effect".

[17] *When an outfitter spends some of the money received by a visitor to purchase new rafts, supplies, etc. but the purchase was from an out-of-state vendor, those dollars are not included in the calculation of the multiplier for the respective counties or the state. Clearly the dollars spent across state lines also generate economic activity, but not for the local communities nor the state of Colorado, and therefore, are not included in the computation of the multiplier. As such, the multiplier effect to the state and its regions and localities is even greater than identified in this report.*

THE MULTIPLIER AT WORK

1 Upon choosing a rafting, kayaking, or fishing trip with an outfitter, the visitor purchases a ticket and also pays a 5.25% user fee. The user fee supports the local parks and wildlife and a water conservation fund while the ticket monies go to outfitter operations to compensate their guides and staff, purchase rafts and other supplies, pay rents and utilities, etc.

2 The recipient of these monies (i.e., the outfitter employees and vendors, etc.) then spend the monies on their own businesses and household needs (payroll, supplies, services, food, utilities, etc.) as well as on taxes and other fees.

3 Businesses, governments, and/or employees providing goods and services purchased by outfitters then see their existing inventory fall or ability to provide services affected and purchase new inventories and/or hire additional employees, etc.

4 Payees of this round of money (retail outlets, service providers, manufacturers of rafts, etc.) and their employees then use this income to purchase their own goods and services, in turn creating more business income and wages.

And the cycle continues...

Appendix B – IMPLAN Results Summary

FIGURE 1.1

2021, Economic Indicators by Impact, Regional

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	494.49	$16,393,818.54	$26,280,218.09	$43,018,149.39
2 - Indirect	68.92	$2,092,517.88	$3,467,024.91	$9,895,649.48
3- Induced	53.73	$2,045,589.53	$4,568,326.57	$8,326,767.79
Totals	617.15	$20,531,925.95	$34,315,569.57	$61,240,566.67

FIGURE 1.2

2022, Economic Indicators by Imact, Regional

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	399	$13,333,701.05	$21,276,029.19	$34,705,402.13
2 - Indirect	55.07	$1,681,189.47	$2,788,582.99	$7,969,551.74
3- Induced	43.42	$1,659,498.75	$3,705,826.90	$6,760,127.12
Totals	497.5	$16,674,389.27	$27,770,439.08	$49,435,080.99

FIGURE 2.1

2021, Tax Results, Regional

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
1 - Direct	$1,105,387.04	$2,503,670.08	$1,076,499.13	$3,662,855.75	$2,720,828.05	$11,069,240.05
2 - Indirect	$41,587.35	$93,316.52	$37,702.38	$177,950.14	$419,195.59	$769,751.97
3- Induced	$80,087.77	$178,296.69	$69,866.06	$294,921.91	$426,775.94	$1,049,948.38
Totals	$1,227,062.16	$2,775,283.29	$1,184,067.57	$4,135,727.80	$3,566,799.59	$12,888,940.41

FIGURE 2.2

2022, Tax Results, Regional

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
1 - Direct	$923,980.84	$2,092,770.49	$899,921.37	$3,051,352.62	$2,188,120.89	$9,156,146.19
2 - Indirect	$33,423.78	$74,968.33	$30,224.46	$143,060.77	$337,178.55	$618,855.89
3- Induced	$65,046.88	$144,805.66	$56,729.78	$239,526.58	$346,630.77	$852,739.68
Totals	$1,022,451.50	$2,312,544.47	$986,875.61	$3,433,939.97	$2,871,930.21	$10,627,741.76

FIGURE 3.1

2021, Economic Indicators by Impact, Chaffee

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	286.18	$10,447,991.39	$16,385,794.36	$26,148,292.18
2 - Indirect	39.63	$1,330,773.15	$2,245,155.65	$6,036,742.56
3- Induced	35.65	$1,359,887.98	$3,045,633.15	$5,559,855.76
Totals	361.46	$13,138,652.51	$21,676,583.16	$37,744,890.50

FIGURE 3.2

2022, Economic Indicators by Impact, Chaffee

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	231.01	$8,497,416.87	$13,258,111.48	$21,094,679.99
2 - Indirect	31.81	$1,071,473.47	$1,809,659.14	$4,880,137.70
3- Induced	28.82	$1,103,259.91	$2,470,736.20	$4,514,748.63
Totals	291.64	$10,672,150.25	$17,538,506.82	$30,489,566.31

FIGURE 4.1

2021, Tax Results, Chaffee County

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
1 - Direct	$680,106.48	$1,406,648.49	$325,871.97	$2,136,336.66	$2,198,897.90	$6,747,861.50
2 - Indirect	$28,223.10	$58,738.50	$14,055.81	$114,516.70	$286,348.18	$501,882.28
3- Induced	$55,854.51	$115,725.76	$27,060.10	$195,176.70	$311,493.75	$705,310.82
Totals	$764,184.09	$1,581,112.75	$366,987.88	$2,446,030.06	$2,796,739.83	$7,955,054.60

FIGURE 4.2

2022, Tax Results, Chaffee County

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
1 - Direct	$568,307.41	$1,175,325.37	$272,164.86	$1,778,538.66	$1,781,770.48	$5,576,106.78
2 - Indirect	$22,743.67	$47,334.76	$11,326.98	$92,307.22	$230,688.00	$404,400.62
3- Induced	$45,376.50	$94,016.21	$21,983.75	$158,562.42	$253,056.04	$572,994.92
Totals	$636,427.59	$1,316,676.33	$305,475.60	$2,029,408.30	$2,265,514.51	$6,553,502.33

FIGURE 5.1

2021, Economic Indicators by Impact, Fremont County

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	208.31	$5,945,827.15	$9,894,423.73	$16,869,857.21
2 - Indirect	29.29	$761,744.74	$1,221,869.26	$3,858,906.93
3- Induced	18.09	$685,701.55	$1,522,693.42	$2,766,912.03
Totals	255.69	$7,393,273.44	$12,638,986.41	$23,495,676.17

FIGURE 5.2

2022, Economic Indicators by Impact, Fremont

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	167.99	$4,836,284.18	$8,017,917.72	$13,610,722.14
2 - Indirect	23.26	$609,716.00	$978,923.85	$3,089,414.05
3- Induced	14.61	$556,238.84	$1,235,090.70	$2,245,378.49
Totals	205.85	$6,002,239.02	$10,231,932.27	$18,945,514.68

FIGURE 6.1

2021, Tax Results, Fremont County

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
1 - Direct	$425,280.56	$1,097,021.59	$750,627.16	$1,526,519.09	$521,930.15	$4,321,378.55
2 - Indirect	$13,364.25	$34,578.02	$23,646.57	$63,433.44	$132,847.41	$267,869.70
3- Induced	$24,233.26	$62,570.93	$42,805.96	$99,745.22	$115,282.19	$344,637.56
Totals	$462,878.07	$1,194,170.54	$817,079.69	$1,689,697.75	$770,059.76	$4,933,885.80

FIGURE 6.2

2022, Tax Results, Fremont County

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
1 - Direct	$355,673.42	$917,445.11	$627,756.50	$1,272,813.96	$406,350.41	$3,580,039.41
2 - Indirect	$10,680.10	$27,633.57	$18,897.48	$50,753.55	$106,490.56	$214,455.26
3- Induced	$19,670.38	$50,789.46	$34,746.03	$80,964.17	$93,574.73	$279,744.76
Totals	$386,023.91	$995,868.14	$681,400.01	$1,404,531.67	$606,415.69	$4,074,239.43

Appendix C – End Notes/ Bibliography

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Survey Resources

Search inquiry for: Nightly hotel prices for a group of three people in June/July 2023 in Canon City, Buena Vista, and Salida, Colorado.

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Telephone interviews with Arkansas River Outfitters Association members

Telephone interview with Tom Waters and John Kreski, Colorado Parks and Wildlife

Customer zip code data from various outfitters

Retail revenue information from various outfitters

2022 Private Boat Counts from Arkansas Headwaters Recreation Area

Appendix D – About the Authors

Pacey Economics, Inc.

Pacey Economics, Inc., located in Boulder, Colorado, has over 35 years of providing consulting services and analyses on an array of economic, public policy, and business issues. We are a small boutique firm, focused on providing economic analyses for state agencies and private or publicly held companies; in addition, we offer economic reports or opinions and expert witness testimony in legal matters. Over the past decades, Pacey Economics, Inc. has been awarded many government contracts through a number of different agencies to forecast, analyze, and evaluate programs and legislative changes. These agencies include Colorado Department of Education (DOE), Colorado Public Employee Retirement Association (PERA), and Corporation for Public Broadcasting (CPB).

Patricia L. Pacey, Ph.D.

Dr. Pacey is President of Pacey Economics, Inc. and Principal Investigator on this project. In addition to her diverse experience testifying as an expert witness, Dr. Pacey has conducted several education funding studies, cost-of-living and economic impact analyses, and for nearly two decades she assisted Boulder Municipal Employee's Association in their wage and benefit contract negotiations, an ongoing relationship her colleague now leads on her behalf. She received her Ph.D. in economics and a Bachelor of Arts in mathematics from the University of Florida, both with honors. She held academic positions with the University of Colorado before forming her own firm, Pacey Economics, Inc., in the early 1980s. Prior to moving to Colorado in the late 1970s, she was an associate for the Congressional Budget Office.

Jeffrey E. Nehls, M.A.

Mr. Nehls has been with Pacey Economics, Inc. since 2009 and was a key contributor to the value analysis. In addition to his expert testimony experience, Mr. Nehls develops databases, designs studies and reports, and conducts quantitative and qualitative research for public policy projects. Mr. Nehls obtained a bachelor's degree in 2007 from University of Puget Sound, Tacoma, with a major in economics and minor in mathematics and a master's degree in economics from University of Colorado Denver in May 2015. Mr. Nehls is a member of several local and national professional organizations and has taught as an adjunct economics professor at Front Range Community College.

Jake M. Zieba, B.A.

Mr. Zieba joined Pacey Economics, Inc. in summer 2022. He is fresh out of college with a bachelor's degree in economics from University of California, Santa Barbara. While in school, Jake acquired solid training and skills in R and Excel and has already demonstrated his ability to manage data, data analyses, and most importantly, critical thinking in addressing the tasks assigned to him. In addition to his research assistance, Mr. Zieba provides supplemental analysis and case support to the expert witnesses at Pacey Economics, Inc. Mr. Zieba was a key contributor to the value analysis.