Recreation Needs of Mountain Bikers at the Whiskey Run Trails in Bandon, Oregon

A Final Report from a 2021 Survey

(February 2022)

Oregon State University Research Team

Dr. Ian E. Munanura

Mr. Javier T. Parada

Mr. Miles Phillips

Dr. Randal Rosenberger

OREGON SOUTH COAST REGIONAL TOURISM NETWORK

Oregon State University College of Forestry

SOUTHERN OREGON COAST

Acknowledgments

The Oregon State University team of researchers prepared this summary report for the Oregon Southcoast Regional Tourism Network (ORSTN) and Travel Southern Oregon Coast (TSOC), the sponsors of the mountain biking research project at Whiskey Run in Bandon, Oregon. This project to conduct research involving human subjects was approved by the Institutional Review Board from the Office of Sponsored Programs and Research Compliance at Oregon State University.

The authors thank Ms. Julie Miller and other stakeholders at ORSTN and TSOC for their support and insightful suggestions throughout this research project. We are grateful to Dr. Ladan Ghahramani for constructive suggestions that contributed to improving the survey instrument. We are also indebted to Mr. Miles Phillips, a member of the Oregon State University (OSU) research team behind this project, for introducing the rest of the OSU team to TSOC and ORSTN and facilitating the contract for this research project. We are grateful to Mr. John Sweet and Mr. Miles Phillips for their insights and facilitation during fieldwork. We finally thank the many respondents for their time and input.

All photos are were captured by Ian Munanura, Javier Parada, and Miles Phillips.

Corresponding Author

Dr. Ian E. Munanura

Ian.munanura@oregonstate.edu or (541-737-4271)

Suggested citation

Munanura* E.I., Parada T.J., Phillips M., & Rosenberger, R. (2022). *Recreation Needs of Mountain Bikers at Whiskey Run in Bandon, Oregon: a Final Report from a 2021 Survey*. Prepared for the Travel Southern Oregon Coast. Corvallis, OR: Oregon State University.

Table of Contents

Contents

Executive Summary

Objectives

This project presents findings from a survey of 409 mountain bikers, including 257 bikers who have been to Whiskey Run and 152 who have not. The survey was conducted in the fall of 2021 by a research team from the College of Forestry at OSU led by Dr. Ian Munanura, an assistant professor of nature-based tourism. The study's main aim was to help Coos County and its collaborators, including TSOC and ORSTN, understand the recreation needs of mountain bikers at Whiskey Run.

Specifically, the project aimed to accomplish four overall goals:

1. Identify the most important recreation facilities to mountain bikers at Whiskey Run.
2. Identify the level of support for selected recreation services at Whiskey Run.
3. Identify the level of support for new recreation management actions aimed to enhance mountain biking experience at Whiskey Run.
4. Identify the level of willingness to contribute resources toward trails maintenance costs

Mr. John Sweet, Coos County Commissioner and the OSU research team during fieldwork

Data collection

To address these research project goals, we designed and administered a questionnaire to mountain bikers using two survey approaches: a) intercepting mountain bikers on-site and b) seeking online responses from mountain biking groups across the state of Oregon and beyond.

The on-site respondents were afforded the option of completing the survey on paper or online. We compared the responses of mountain bikers who have been to the Whiskey Run biking trails and those who have not to understand whether mountain bikers who have not been to Whiskey Run have unique recreation needs and there is a potential market growth opportunity for the Whiskey Run biking trails. Additionally, considering that mountain biking is a highly specialized recreation activity, we compared the responses across recreation skill levels (e.g., beginners, novice, intermediate, and expert bikers). According to the recreation specialization theory, an increase in recreation skill level is positively associated with recreation attributes influencing recreation participation, behavior, and motivation (Ewert & Hollenhorst, 1994; Lee et al., 2007). Therefore, in this report, we summarize the main findings based on the recreation attributes of mountain bikers at Whiskey Run and also the attributes of Whiskey Run as a recreation site. These findings serve as scientific baseline data to enable Coos County recreation managers to formulate and advance defensible recreation management decisions.

Summary of findings

Demographic characteristics of respondents

- Gender distribution: Out of 409 respondents who completed the survey, about 74% were men and 25%women. The results show more women bikers among bikers who have been to the Whiskey Run trails (female respondents are 30.7%) than among bikers who have not (female respondents are 14.8%). These statistics indicate that female bikers represent a potential growth area for marketing the Whiskey Run biking trails.
- Age: Results show that most of the respondents are within the young (48.8%; 18 to 44 years) and adult (43.5%; 45 to 65 years) working-age brackets. Therefore, for the development and delivery of a promotion and marketing strategy for the Whiskey Run trails, the management should target the young (e.g., by showcasing the thrills of challenging

mountain biking experiences) and adult (e.g., by showing safe and family-oriented biking adventure experiences offered at the Whiskey Run trails) working-age groups.

- Origin: Results show that the origin of visitors varies. About 21% of respondents are from Coos County, 18% from Willamette Valley, 13% from Central Oregon, and about 26% from out of state, particularly Washington State and California. Considering the respondents who have been to Whiskey Run trails, the results show that about 31% are from Coos County, 18% are from out of state (e.g., Washington and California), 16% are from Willamette Valley, and about 12% are from Central Oregon. These six locations (Coos County, Willamente Valley, Central Oregon, Washington State and California represent the geographical areas of market growth for mountain bikers at the Whiskey Run trails. They should be the focus of marketing and promotion for the Whiskey Run trails system.
- Race, income, and education: Overall, the respondents are white (about 86%), highly educated (about 69% have a four-year college degree or advanced graduate degrees), and affluent (about 53% earn $100,000 and more per year). These results confirm that a typical mountain biker to the Whiskey Run trails is more likely to be white, highly educated, and affluent. This information indicates that the Whiskey Run trails can attract and sustain a high-end market segment of mountain bikers and would fit well with the quality of recreation experience set by the Bandon Dunes Golf Resort. Therefore, this report recommends that the Whiskey Run trails be developed and marketed as a high-end biking destination if the quality services suggested in this report are developed and maintained. The demographic information also reveals the potential for market growth among other racial groups, particularly the Latino and mixed racial groups of bikers. Developing these biker markets depends on forming strategic alliances with Latino and other race-based mountain biking groups and advocates to promote the Whiskey Run trails among underrepresented groups of people in Coos County, Washington state, Willamette Valley, and Central Oregon.

Individual recreation attributes of mountain bikers recreating at the Whiskey Run trails

- Source of information about Whiskey Run: The results show that most bikers using the Whiskey Run trails learn about the trail system through word of mouth (43.2%) and that most (76.8%) travel to the Whiskey Run area purposely for mountain biking. Therefore, the

unique trails and biking experiences clearly attract bikers to Whiskey Run. The management should emphasize more the uniqueness of trails at Whiskey Run in promotional materials (both print and online) and trail development.

- Skill level of bikers using Whiskey Run: Most bikers attracted to the Whiskey Run trails (82.6%) are skilled (intermediate and expert bikers). Therefore, efforts to enhance and maintain quality recreation experiences at the Whiskey Run trails should focus on addressing the needs of the skilled mountain bikers, which this report outlines.
- Origin of bikers using Whiskey Run: The data shows that a substantial number of bikers (about 30%) at the Whiskey Run trails are local (Coos County residents) or come from nearby areas within a distance of about 50 miles or less (12.1%). Most of the bikers going to the Whiskey Run trails (37.4%) come from outside the Coos County region and travel about 101 to 300 miles. The bikers outside the Coos County region appear skilled compared to local bikers. Therefore the marketing and promotion of the Whiskey Run trails among local mountain bikers should focus on promoting it for novice bikers within a 50-mile radius. In contrast, the marketing efforts outside Coos Bay could focus on skilled bikers in areas within a radius of 300 miles.
- Mode of travel for bikers using Whiskey Run: Results show that most bikers (88.6%) travel to the Whiskey Run trails by car. This finding shows the need for resources to expand and maintain parking spaces at trailheads. At the same time, the growth of mountain biking bears the risk of exceeding the carrying capacity of parking spaces and the emergence of associated issues such as visitor use conflict. The recommended strategy of zoning trail and trail use by skill level would help manage the visitor use of the Whiskey Run trails and mitigate visitor use conflict.
- Recreation behavior of bikers using Whiskey Run: Most bikers recreate in groups of three to five people (40%) and mountain bike for about three to four hours per day, which indicates that Whiskey Run is arguably a family mountain biking destination. This attribute should be emphasized in trail development (e.g., by addressing safety issues and concerns) and in promoting Whiskey Run (e.g., by highlighting that Whiskey Run offers a family-oriented, fun, and safe biking experience).
- Riders' satisfaction with experience at Whiskey Run: Overall, mountain bikers very much enjoyed their experience at Whiskey Run (i.e., an average rating of 4.5 out of 5).

Particularly, the bikers expressed that the Whiskey Run trails meet their expectations of biking in nature (average rating of 6.27 out of 7), and the trail experience offered is somewhat congruent with their bicycling recreation goals (average rating of 5.92 out of 7). Bikers report high positive feeling outcomes after riding at Whiskey Run (average rating of 4.04 out of 5). Hence, the likelihood of recommending Whiskey Run to other bikers (average rating 4.6 out of 5) and returning to recreate (average rating of 4.18 out of 5) was high among mountain bikers at Whiskey Run. These results instill confidence in recreation managers that they are developing and providing a desirable and satisfactory mountain biking experience at the Whiskey Run trails.

Recreation attributes of the Whiskey Run trails

- Bikers' perception of the importance of recreation facilities at Whiskey Run: Results presented in the report identify two essential recreation facilities for mountain bikers at Whiskey Run: the expanded parking space at trailheads (average rating of 4.76 out of 5) and the installation of more clear directional signs within trails (average rating of 4.54 out of 5). The report also reveals about four recreation facilities that are important to mountain bikers: providing directional signs to trails (average rating of 4.28 out of 5), installing information signage (average rating of 4.14 out of 5), providing trash cans (average rating of 4.19 out of 5), and installing pit toilets at trailheads (average rating of 4.02 out of five). These recreation facilities need prioritization, considering that all users desire them.
- Variation in the perceived importance of recreation facilities by the skill level of bikers: The results also exhibit variation in the perceived importance of a few recreation facilities based on the skill level of recreation bicycling. For example, the perceived importance of pit latrines is significantly higher among beginners than more experienced biking groups, which also indicates the necessity of pit latrines. In contrast, the desire for camping services is significantly higher among more experienced biking groups (expert and intermediary) than less experienced ones (e.g., novice). Considering that experienced bikers account for over 80% of the bikers who recreate at the Whiskey Run trails, camping services are highly recommended to enhance the recreation experiences of the market segment most attracted to Whiskey Run. Additionally, this report suggests that all trailhead parking spaces at the Whiskey Run trails have pit latrines.

- Support for recreation services at Whiskey Run: The report identifies recreation services at Whiskey Run, which are perceived to be most desired to bikers. The most-supported recreation services include creating restrooms at trailheads, tent campgrounds with bathrooms at trailheads, and a recreational vehicle park/camping area, which would likely boost bicycling recreation at the Whiskey Run trails, especially among experienced bikers. These recreation services are recommended for development.
- Influence of biking skill level in support for recreation services: Particularly, support for restrooms at trailheads is highly desirable across all four skill-level groups of bikers. Therefore, this report recommends installing bathrooms at all trailheads of the Whiskey Run trails. The report also shows that highly skilled bikers support services such as information kiosks, recreational vehicle park/camping areas, and tent campgrounds with bathrooms at trailheads much more than the inexperienced bikers do. Therefore, considering that experienced bikers constitute a significant portion (80%) of the Whiskey Run trails users, the installation of information kiosks at all trailheads is recommended. Additionally, a camping facility (whether a tent campground or recreational vehicle park with bathrooms) should be developed not too far from the trailheads but out of sight from the parking area to minimize perceived crowding and visitor use conflict issues (Manning, 1999).
- Support for new recreation management actions: Some of the new recreation management actions have support among the visitor and non-visitor respondents. The data also shows that this support increases with biking skill level. Therefore, the skill level should serve as a basis for prioritizing new recreation management actions within the context of activities most likely to increase the recreational visits of bikers to Whiskey Run. Considering both the level of support for each recreation management action and the likelihood of positively impacting recreation behavior, the following top ten recreation management actions are recommended to attract more unskilled riders to Whiskey Run to enhance their recreation experiences:
    1. Provide easy, smooth, and beginner-friendly trails (i.e., green circle).
    2. Improve maintenance or upkeep of trails in this area.
    3. Provide directional trails (e.g., uphill only, downhill only).
    4. Provide somewhat challenging trails for intermediate users (i.e., blue square).
    5. Expand the trails to increase the miles of available trails.

6. Diversify the type of trails available to bikers.
7. Provide more facilities or services in this area (trash cans and restrooms).
8. Provide very challenging, difficult, and technical trails (i.e., black diamond).
9. Provide a mountain biking skills park.
10. Provide primitive trails with many natural features of varying difficulty.

- Similarly, the report identifies the top ten recreation management actions, presented in the order of priority below, that have the most potential to attract and enhance the experiences of skilled bikers at Whiskey Run:
    1. Expand the trails to increase the miles of available trails.
    2. Provide somewhat challenging trails for intermediate users (i.e., blue square).
    3. Diversify the types of trails available to bikers.
    4. Provide very challenging, difficult, and technical trails (i.e., black diamond).
    5. Provide directional trails (e.g., uphill only, downhill only).
    6. Improve maintenance or upkeep of trails in this area.
    7. Provide primitive trails with many natural features of varying difficulty.
    8. Provide a mountain biking skills park.
    9. Provide more facilities or services in this area (trash cans and restrooms).
    10. Provide extremely challenging, difficult, and technical trails (i.e., double black diamond).
- Zoning use of trails and facilities by skill level: The report suggests that the trails and facilities used by unskilled bikers be separated from those used by the skilled, considering a) the uniqueness of recreation needs of unskilled bikers compared to skilled ones, b) the potential for recreation conflict resulting from mixed skill level use, and c) the need to maintain high-quality standards of bicycling recreation. Zoning the location of trails, trailheads, and parking by skill level will help the management minimize recreation use conflict and sustain the quality and uniqueness of rides at Whiskey Run. The report suggests that the above recreation management actions for both skilled and unskilled riders receive regular monitoring and active management from Whiskey Run recreation managers.
- Alternative sources of trail maintenance resources: The report shows that mountain bikers support all three alternative sources of trail maintenance resources. For example, bikers are willing to volunteer in trail maintenance activities (average rating of 4.33 out of 5), donate

voluntarily to a trail maintenance fund (average rating of 4.21 out of 5), and support endowment funds created for trail maintenance (average rating of 4.12 out of 5). Results also show that highly skilled bikers are more likely to volunteer time for trail maintenance than less-skilled bikers are. Beginners are less likely to support all three alternative sources of trail maintenance resources. Most of those who are likely to donate would find an annual donation of $50 reasonable. Therefore, the management can create a volunteer trail maintenance program to engage and mobilize skilled bikers to participate in trail maintenance. Additionally, the management should start a $50 donation campaign for trail maintenance online and a link accessible to riders on-site at Whiskey Run. Pursuit of the alternative trail maintenance resources suggested above would be more likely to succeed if they target skilled bikers (e.g., through high-skilled rider groups).

Way forward

- Control the growth of biking and pay attention to enhancing the quality of recreational biking experience: In summary, the suggestions outlined above carry the risk of accelerating the growth of mountain biking and the associated adverse effects (e.g., overcrowding and visitor use conflict). To mitigate that risk, this report suggests, in the short-term, separating unskilled trails and related facilities (e.g., parking, toilets) from skilled trails as a short-term solution.
- Long-term solution: A long-term solution requires complementing the trail use zoning by skill level with regular monitoring of the visitor carrying capacity of trails and potential conflict issues associated with uncontrolled growth in mountain biking at Whiskey Run. Therefore, soon, a study is needed to determine the level of recreational bicycling the Whiskey Run trails can withstand before the desired quality of recreation is compromised. Such a study would help set physical, social, and facility capacity standards (limits of acceptable growth in biking) for Whiskey Run. The study would also create monitoring indicators or instruments that would enable the Whiskey Run management to regularly monitor, detect, and mitigate activities, events, and situations likely to violate the set recreational carrying capacity standards of the Whiskey Run trails.
  Answering this question is crucial: *What is the carrying carrying capacity of Whiskey Run trails? (in more specific terms- what is the level at which the physical, social, and facility*

carrying capacity is exceeded to adversely affect the mountain biking experience at Whiskey Run trails?)

- The vision behind the short-term and long-term solutions suggested: Integrating both solutions is important because Whiskey Run is near one of the top-quality tourism destinations in the country (Bandon Dunes Golf Resort). Therefore, any tourism and recreation attraction in Bandon, including Whiskey Run, will benefit from high-quality standards. Sustaining the image of Whiskey Run as a top mountain biking destination in Oregon requires understanding quality goals and creating active monitoring and management activities to mitigate potential biking growth risks. The outlined recommendations in this report provide a foundation for the Whiskey Run management to start the process of setting a recreation vision linking the Whiskey Run trails to Bandon Dunes Golf Resort in terms of the quality of recreation experiences offered. Such a strategic alliance would also help create recreation management and promotion alliances (i.e., offering trail use as an added activity for golfers and having rental mountain bikes at the Golf-resort). This recommended recreation vision presents an opportunity to set a high-quality bar for the recreation experience at the Whiskey Run trails among the many competing mountain biking destinations in Oregon.

1.0 Introduction

The south coast is gaining prominence as a leading tourism and recreation destination in Oregon. Coos County, one of Oregon's south coast counties, is critical to the growth of Oregon's tourism and recreation sector. Tourism earnings and tax revenue in Coos County, for example, are growing at an annual rate of 6.6 and 2.6%, respectively. On this note, the Whiskey Run mountain biking trails, a top tourist attraction, have the potential to create a more significant socio-economic impact in Coos County by advancing tourism growth, job creation, and community vitality.

Mountain biking is emerging as a popular outdoor recreation activity worldwide and in the United States, including Oregon (Newsome et al., 2016; Runyan, 2012). Most rural towns and communities are turning to mountain biking to revitalize struggling rural economies (Buning & Lamont, 2021). Therefore, it is not surprising that the Whiskey Run mountain biking system is emerging as one of the leading recreation attractions in Oregon's coastal region. To understand and gain from such a popular tourism and recreation attraction in Coos County, the County Commissioners, working with collaborators from TSOC and ORSTN, seek to understand and address the recreation needs of mountain bikers at Whiskey Run. Coos County's vision is to provide mountain bikers with exceptional quality services to position the Whiskey Run trails as the top mountain biking attraction in Oregon, which would benefit the residents of the county.

Therefore, this research project examined the recreation needs of mountain bikers at Whiskey Run. Specifically, the project aimed to accomplish four overall goals:

1. Identify the most important recreation facilities to mountain bikers at Whiskey Run.
2. Identify the level of support for selected recreation services at Whiskey Run.
3. Identify the level of support for new recreation management actions aimed to enhance mountain biking experience at Whiskey Run.
4. Identify the level of willingness to contribute resources toward trails maintenance costs

To address the project goals, we designed and administered a questionnaire to mountain bikers using two survey approaches: a) intercepting mountain bikers on-site and b) seeking online responses from mountain biking groups across the state of Oregon. The onsite respondents had the

option of completing the survey on paper or online. We compared the responses of mountain bikers who have been to the Whiskey Run biking trails and those who have not to understand the unique recreation needs of mountain bikers who have not been to Whiskey Run and a potential market growth opportunity for the Whiskey Run trails. In this report, we summarize the main findings. These findings serve as scientific baseline data to enable Coos County recreation managers to formulate and advance defensible recreation management policies and decisions.

Ian Munanura and Javier Parada, OSU researchers at research site/Whiskey Run trailhead

Ian Munanura (OSU Corvallis Campus) and Miles Phillips (OSU Extension Oregon South Coast tourism specialist) at research site

2.0 Methods

Data for this research project was obtained onsite (*i.e., in-person survey delivery*) and online. In October 2021, the research conducted onsite surveys at the Whiskey Run biking trails. On each survey day, the OSU survey team asked mountain bikers at the trail entrance or exit points to complete the survey on paper or online using a link provided to the Qualtrics version of the survey. Throughout October and November, the OSU research team sought responses from mountain bikers across the state of Oregon through known mountain biker groups (*see Appendix 6.1 for some of the mountain biking groups who helped distribute the survey*). All respondents were informed about the project's purpose and were aware that responding to the survey was voluntary.

The OSU team designed the questionnaire (*see Appendix 6.2*) with TSOC and Travel Oregon (i.e., Dr. Ladan Ghahramani). The first part of the questionnaire (*i.e., questions 1 through 17*) and the demographic information section at the end (*i.e., questions 45–51*) included questions aimed at generating descriptive information about mountain bikers who typically recreate at the Whiskey Run biking trails. The second part of the questionnaire had questions aimed at understanding the most desirable recreation facilities and services at the Whiskey Run biking trails. Questions in the second part aimed to assess the influence of recreation needs on the recreation of the mountain bikers at Whiskey Run, the willingness of mountain bikers to contribute toward maintenance costs, and the support for management actions perceived to enhance the mountain biking experience (*i.e., questions 18 through 29*). The third part of the questionnaire included questions aimed at understanding factors critical to the positive mental evaluation of the mountain biking experience at the Whiskey Run trails and, therefore, likely to lead to repeat visits and word-of-mouth recommendations *(i.e., questions 30 through 44*).

Four hundred thirty-three (433) people responded to the survey, and the research team removed 24 response cases for incomplete responses. Therefore, this report presents responses from 409 participants, representing 257 respondents (62.8%) who have recreated at the Whiskey Run biking trails and 152 respondents (37.2%) who have not. To understand the opinions of bikers who have been to the Whiskey Run trails and those who have not, we compared the responses to questions not specific to the Whiskey Run trails and associated experiences. For example, we compared answers

to questions seeking to understand the desired recreation experiences and their impact on recreation behavior (*i.e., questions 18 through 44*).

In this report, responses are presented in percentages and provide evidence of statistical differences in responses between mountain bikers who have been to Whiskey Run and those who have not. The research team conducted data analysis in Statistical Package for Social Sciences (SPSS) software package 27. Specifically, the team used crosstabulations and inferential statistical analysis tools in SPSS to understand the differences in opinions based on biking skill level and prior visit experience. Additionally, the research conducted scale reliability tests for composite variables measured through proxy indicators before comparing composite variables across both groups of mountain bikers. More details on the scale reliability analyses conducted are provided in Appendix 6.4.

Source: http://bandon.com/ride-whiskey-run-mountain-bike-trails/

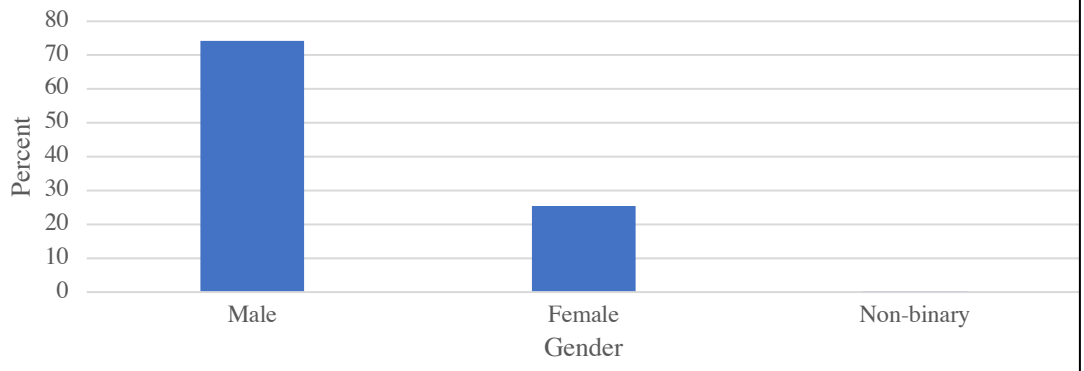
3.0 Findings

3.1 Respondent Characteristics

Four hundred nine respondents completed the survey, and about 74% were men, 25% were women, and those identifying as non-binary were less than 1% (*see Figure 1*). The gender distribution across visitor and nonvisitor respondents shows that the gender ratio significantly differs (*the chi-square difference test was significant at 95% confidence level, see Table 1-A in Appendix 6.4*). The results in Table 1-A in Appendix 6.4 show more female bikers among riders who have been to Whiskey Run (*female respondents are 30.7%*) than among those who have not (*female respondents are 14.8%*), indicating a potential area of growth that merits active management and support.

The literature identifies this gender gap in mountain biking and suggests that deliberate efforts are needed to make such a male-dominated recreation activity more inclusive (Hill & Gomez, 2020). The literature also shows more psychological benefits to female mountain bikers than men (Hill & Gomez, 2020). Other destinations in Oregon, such as Bend, host female-specific mountain bike clinics to attract the female market (*i.e., Ladies Allride organized by the Liv and Sram brands*). Local bike shops are an excellent resource for managing this kind of event, as they have direct contact with brands that may be interested in supporting events. More prominent brands can help by offering sponsorship and gifts or even bringing a well-known athlete to lead the event.

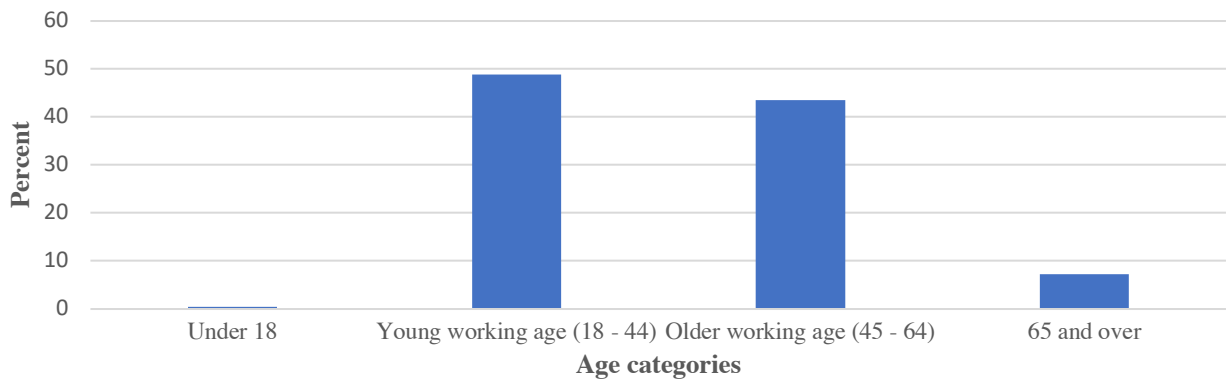
Figure 1: Gender distribution of all respondents (visitors and nonvsitors)



The data indicates that most respondents are within the young working-age group of 18 to 44 years (48.8 %) and the adult working-age bracket of 45 to 64 (43.5%, *see Figure 2*). As shown in Table 1-B in the appendix, the age distribution across both current and future markets does not differ statistically (*chi-square difference test was not significant at 95% confidence level, see Table 1-B in the appendix*). These results indicate that young and older working adults are the age groups more likely to visit the Whiskey Run biking trails. Therefore, for the development and promotion of the Whiskey Run trails, the management should direct their attention to the young working age (18 to 44, e.g., *by showcasing the thrills of challenging mountain biking experiences*) and the adult working-age group (45 to 65, e.g., *by showing safe and family-oriented biking adventure experiences offered at the Whiskey Run trails*).

Additionally, considering the desire to maintain the high quality of the tourism and recreation theme set by the Bandon Dunes Golf Resort, the 65 and over age group, which is likely to have resources and time to spend on mountain biking, represents a market growth opportunity for the Whiskey Run biking trails. Therefore, the recreation management at Whiskey Run is advised to include this market segment in the trail system's management and development (*e.g., developing easy, smooth, and safe trails for the 65 and over age group*) and promoting them through strategic marketing alliances with Bandon Dunes Golf Resort. A few competing destinations offer such customized and targeted trail systems (*e.g., Bend, as shown through the Bend trails website: www.bendtrails.org*). Tailored and targeted trails would offer Whiskey Run a competitive advantage over many other biking destinations. To aid the planning of recreation rides for mountain bikers, current Whiskey Run users should be encouraged to leave comments about the specific trails and their characteristics on online apps such as Trailforks or MTBProject.

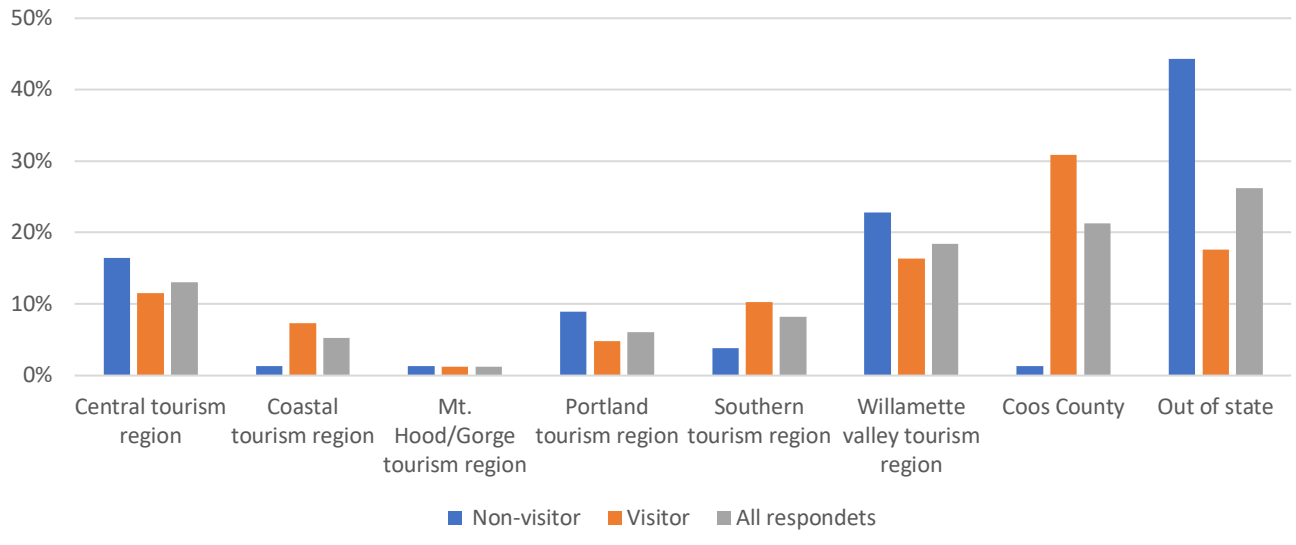
Figure 2: Age distribution of all respondents (visitors and nonvisitors)



We examined the origin of respondents to understand the place where the Whiskey Run trail riders currently live and the regions of potential market growth. The results, presented in Figure 3, show that most visitor and non-visitor respondents are from out of state regions such as Washington State and California (*about 26%*), the Coos County area (*about 21%*), the Willamette Valley area (*about 18%*), and Central Oregon (*about 13%*). Considering only the respondents who have been to Whiskey Run trails, the results show that about 31% are from Coos County, 18% are from out of state (e.*g., Washington and California*), 16% are from Willamette Valley, and about 12% are from Central Oregon.

Therefore, these regions (Coos County, Willamette Valley, Central Oregon, Washington State, and California) represent the geographical areas of market growth for mountain bikers at the Whiskey Run trails. Comparing the location distribution across the current and future markets for the Whiskey Run trails reveals no statistically significant difference (*chi-square difference test was not significant at 55% confidence level, see Table 1-C in the appendix*). These group difference test results show that recreation managers at Whiskey Run would be well served by focusing communication and marketing resources toward these five regions to maintain the current market segment and attract new mountain bikers to the Whiskey Run trails.

Figure 3: Geograpical regions representing the location of all respondents (visitors and nonvisitors).



Finally, Table 1 below summarizes respondents' race, income, and education attributes. Overall, the respondents are white (about 86%), highly educated (about 69% have a four-year college degree or advanced graduate degrees), and affluent (*about 53% earn $100,000 and more per year*). When compared across current and future market segments, the results show no statistically significant differences in race, ($\chi 2 = 8.519, p > .05$), education (($\chi 2 = 7.37$, $p > .05$), and affluence ($\chi 2 = 7.45$, $p > .05$). These results confirm that a typical mountain biker to the Whiskey Run trails is more likely to be white, highly educated, and affluent.

Two conclusions are drawn from these results. First, the demographics of mountain bikers show that Whiskey Run is attracting a high-end tourism and recreation market segment attuned to the quality recreation experience set by the Bandon Dunes Golf Resort. Therefore, the Whiskey Run trails could be developed and marketed as a high-end biking destination if the quality services suggested in this report are developed and maintained. Second, these demographics suggest a potential for market growth among other racial groups, particularly the Latino and mixed racial groups of bikers. To develop these markets, the management of the Whiskey Run trails system could form strategic alliances with the Latino and other race-based mountain biking groups (*i.e., Brooke Goudy and her "A space for all" initiative": https://yeticycles.com/stories/a-space-for-all-brook-goudy*). These groups could help link the Whiskey Run trails to underrepresented bikers in locations where most riders reside (*e.g., Coos County, Washington State, Willamette Valley, and Central Oregon*).

Table 1: Demographic information of all visitor and non-visitor respondents to the mountain bikers' survey

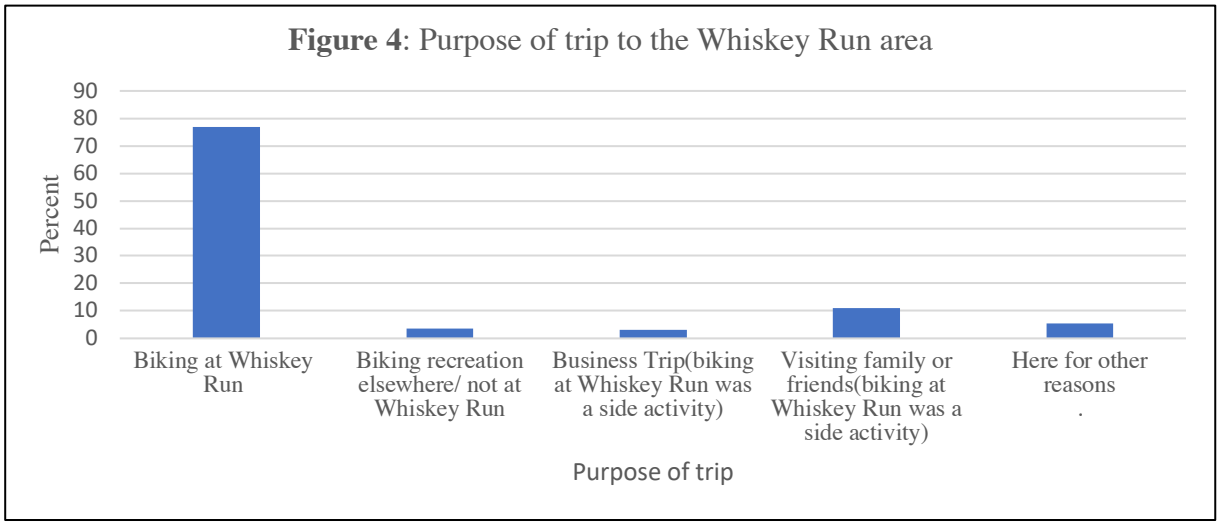
Demographic Information of respondents	**Frequency**	**Valid Percent**
Race (n = 264)		
White (Caucasian)	228	86.4%
Hispanic or Latino	15	5.7
Asian	1	0.4
Other race	11	4.2
Native American or Alaskan native	5	1.9
Native Hawaiian or Pacific Islander	4	1.5
Income (n = 250)		
Under $25,000	7	2.8
$25,000 to $49,999	26	10.4
$50,000 to $74,999	44	17.5
$75,000 to $99,999	40	15.9
$100,000 to $149,999	57	22.7
$150,000 to $199,999	42	16.7
$200,000 to $249,999	15	6
$250,000 or more	20	8
Education (n = 259)		
Less than a high school diploma	1	0.4
9th to 12th grade, but no diploma received	1	0.4
High school diploma or GED	11	4.2
Some college, but no degree received	40	15.4
Associate degree or 2-year technical school	27	10.4
4-year college degree (e.g., a bachelor's degree)	94	36.2
Graduate degree beyond 4-year college degree (e.g., master's degree)	86	33.1

3.2 Recreation Attributes of Mountain Bikers at the Whiskey Run Trails

Respondents were asked about their individual recreation attributes shaping their recreation experience and behavior at the Whiskey Run trails. Particularly, respondents were asked about the purpose of their trip to the Whiskey Run area, from where and how far they traveled to recreate there, how they learned about it, how they traveled to the Whiskey Run trails, how often they recreate there in a year and in each season (winter, fall, spring, and summer), how many people often travel for a biking event at the Whiskey Run trails, how many hours bikers typically recreate there, and what their skill level in bicycling for recreation is. According to the recreation attributes framework, most of these questions represent individual recreation attributes (Ewert & Hollenhorst, 1994). The latter question (i.e., skill level) was aimed at finding out whether recreation attributes determining recreation participation, experience, and behavior (Lee et al., 2007) differ by level of recreation skill. According to recreation specialization theory, an increase in recreation skill level is positively associated with recreation attributes influencing recreation participation, behavior, and motivation (Ewert & Hollenhorst, 1994; Lee et al., 2007). Mountain biking is a highly specialized recreation activity. Thus, understanding individual recreation attributes across diverse skill levels is essential. The level of recreation skill is arguably responsible for bikers' participation, experience, and motivation at the Whiskey Run trails. This information would inform the recreation management of the need for differential recreation programing for bikers of diverse levels of specialization at the Whiskey Run trails. For example, novice bikers may have different recreation needs compared to expert bikers (Symmonds, 2000)

3.2.1: Purpose of the trip to the Whiskey Run area

The data shows that most bikers at the Whiskey Run trails (76.8%) travel to the Whiskey Run area specifically for mountain biking (*see Figure 4 and Table 2-A in Appendix 6.5*). When compared across skill levels, the results (Table 2) do not statistically differ in responses from bikers of different skill levels ($\chi 2 = 18.08, p > .05$). Together, the results show that the unique experience trails offer attracts bikers to Whiskey Run. In other words, the level of skill in recreation biking does not influence the purpose of a trip to the Whiskey Run trails. Therefore, future investment in the development of trails and marketing for their use ought to be focused on addressing the quality recreation needs of intermediate and expert bikers who are most attracted to the Whiskey Run trails (*82.6% of bikers to the Whiskey Run trails are either intermediate or expert bikers—see Figure 5 and Table 2-G in Appendix 6.5*).



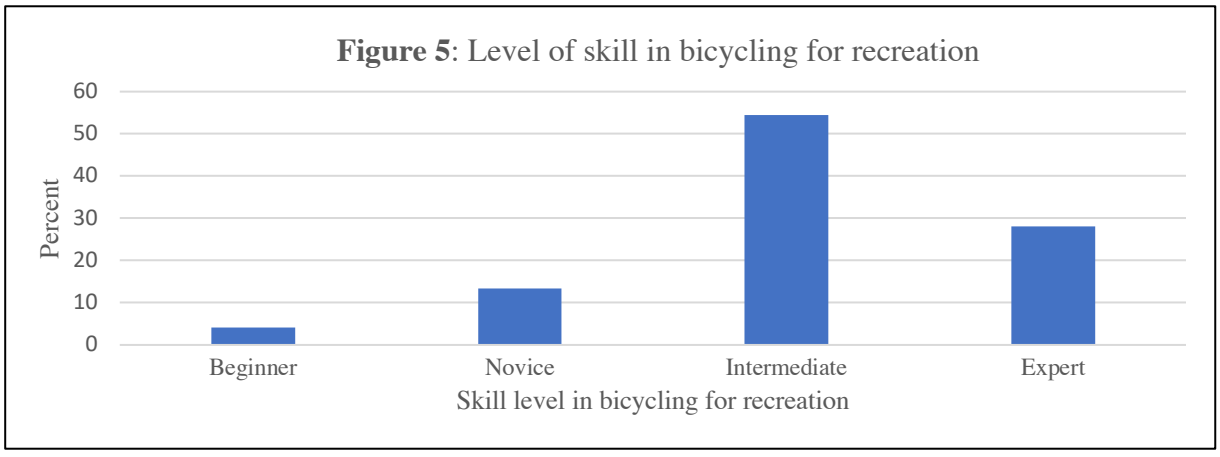


Table 2: Purpose of the trip categorized according to the skill level of bikers

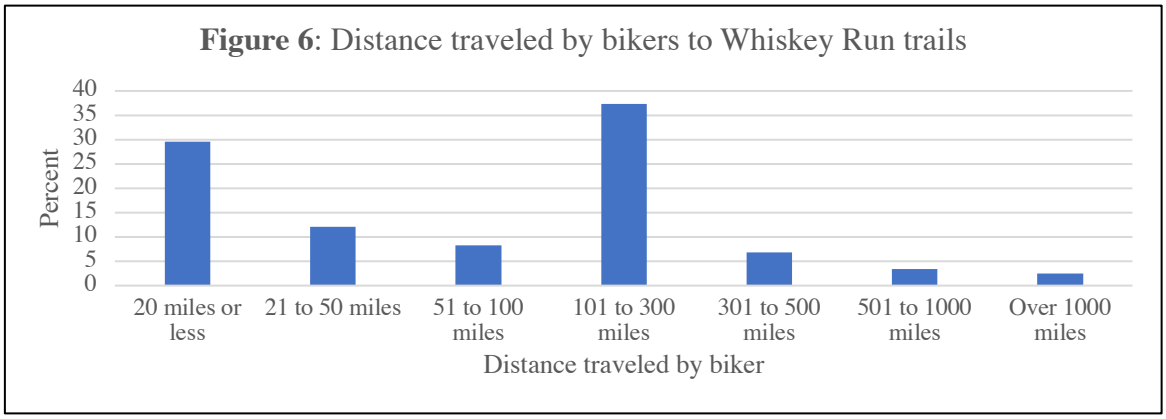
Purpose of the trip to the Whiskey Run area	Skill level in bicycling for recreation				
	Beginner (n = 7)	**Novice** (n = 36)	**Intermediate** (n = 118)	**Expert** (n = 59)	**Total** (n = 220)
Primarily for biking recreation here	57.1%	88.9%	76.3%	72.9%	76.8%
Primarily for biking recreation elsewhere	0.0%	5.6%	4.2%	1.7%	3.6%
Primarily for business	0.0%	2.8%	1.7%	6.8%	3.2%
Primarily for visiting family or friends	42.9%	0.0%	11.0%	13.6%	10.9%
Other reasons	0.0%	2.8%	6.8%	5.1%	5.5%

Note: Chi-square = 18.08, df = 12, p-value = 0.113; n = sample size.

3.2.2: Distance traveled by bikers to recreate at the Whiskey Run trails

The data shows that a substantial number of bikers at the Whiskey Run trails are local (*Coos County residents*) or come from nearby areas and travel a distance of about 50 miles or less (*41.7%, see Figure 6 and Table 2-B in Appendix 6.5*). Most of the bikers from outside the Coos County region travel a distance of about 101 to 300 miles (see Figure 6). When compared across skill levels, the results (*Table 3*) demonstrate a significant statistical difference in responses ($\chi 2 = 32.38, p < .05$). In other words, the level of biking skill influences the distance bikers travel to recreate at the Whiskey Run trails. Highly skilled riders are more likely to visit from distant regions; thus, Whiskey Run trails' marketing and promotion efforts in such locations should pay more attention to skilled biker groups.

Most of the bikers from nearby areas (within 50 miles) are predominantly less specialized (*i.e., beginners or novices*). In contrast, travelers from distant locations (*over 100 miles—especially in Central Oregon, Willamette Valley, and out-of-state regions—see Figure 7*) are predominantly intermediate or expert bikers. Together, these results demonstrate the effectiveness of the current strategy to develop and promote difficult and easy rides. Difficult trails cater to distant bikers' (*intermediate/experts*) markets, while easy trails cater to the needs of local riders (*beginners/novices*). Therefore, efforts to develop and market Whiskey Trails in Coos Bay should focus on novice recreation attributes (*i.e., the experience of biking on easy trails*). In contrast, distant marketing efforts should focus on showcasing the thrills of biking on difficult trails, which arguably appeal to intermediate and expert bikers. As noted later on in the report, zoning trails by skill level (*skilled bikers trail zone and unskilled bikers trails zone*) would be a worthwhile strategy.



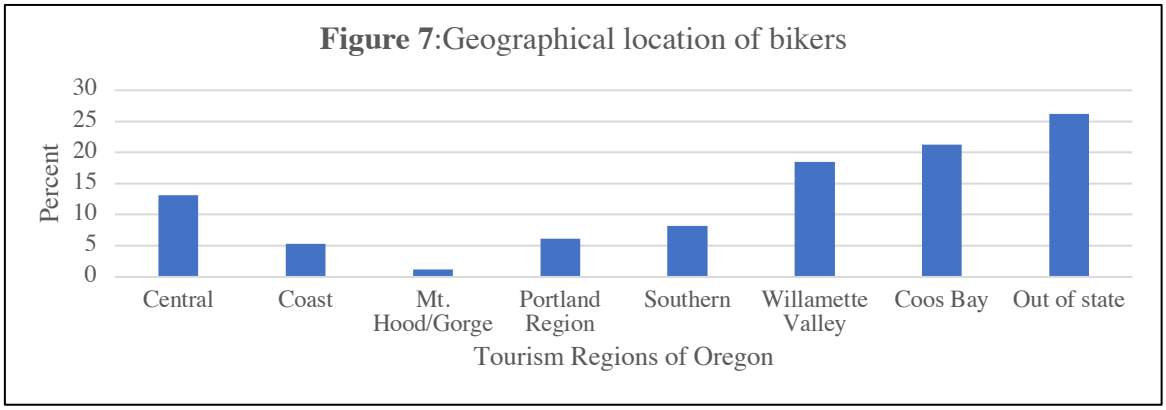


Table 3: Distance traveled by bikers to the Whiskey Run trails

	Skill level in bicycling for recreation				
Distance traveled by bikers to the Whiskey Run trails	**Beginner (n = 6)**	**Novice (n = 32)**	**Intermediate (n = 114)**	**Expert (n = 54)**	**Total (n = 206)**
20 miles or less	16.7%	50.0%	28.1%	22.2%	29.6%
21 to 50 miles	33.3%	28.1%	6.1%	13.0%	12.1%
51 to 100 miles	16.7%	3.1%	10.5%	5.6%	8.3%
101 to 300 miles	16.7%	15.6%	40.4%	46.3%	37.4%
301 to 500 miles	16.7%	0.0%	7.9%	7.4%	6.8%
501 to 1000 miles	0.0%	0.0%	4.4%	3.7%	3.4%
Over 1000 miles	0.0%	3.1%	2.6%	1.9%	2.4%

Note: Chi-square = 32.38, df = 18, p-value = 0.02, Cramer's V (effect size) = .23; n = sample size.

3.2.3: Source of information for bikers at the Whiskey Run trails

The data shows that most bikers learn about the Whiskey Run trails from word-of-mouth recommendations (43.2%), as shown in Figure 4 and Table 2-C in the appendix. Results also show that about 21% of them learn about the Whiskey Run trails from the Internet. The results (*Table 4*) show no statistical difference in responses from bikers when compared across skill levels ($\chi 2 = 17.91, p > .05$). In other words, the level of skill in recreation biking does not influence how one learns about the Whiskey Run trails. Together, the results show that efforts to promote the Whiskey Run trails should concentrate on maintaining the high quality of recreation experiences for bikers, which arguably enhances word-of-mouth recommendations. Additionally, focusing on promotion and marketing efforts online, for example, targeting online biking groups, is likely to promote the Whiskey Run trails. Using Facebook accounts of popular biking groups to promote the Whiskey Run trails in locations where most mountain bikers come from (*e.g., Willamette Valley, Central Oregon, Washington state, and California)* could be beneficial. For example, the Whatcom Mountain Bike Coalition (in Washington) Facebook page has over 6,000 followers. Popular YouTubers (*e.g., BCPOV, BKXC, Berm Peak, Jordan Boostmaster, and Van Girl Yuka*) could also promote the Whiskey Run trails. BKXC, in particular, uploaded a video riding the Whiskey Run trails, which currently has 49,593 views and has a variety of positive comments from the community, such as, "*…[Whiskey Run] is a great trail system. Plus, they allow e-bikes that make trails more useful for all riders. If you can make your system anything like Whiskey Run, you will be in luck*". Other mountain bikers read these comments. They are crucial for Whiskey Run, considering word-of-mouth is the primary source of information for Whiskey Run bikers, as depicted in Table 4 below.

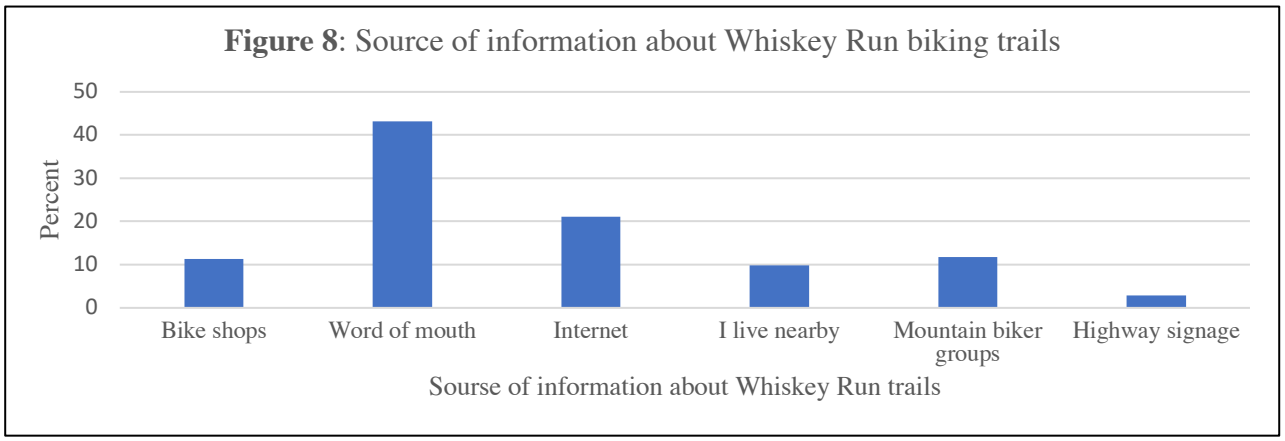


Table 4: Source of information about the Whiskey Run biking trails

Source of information about the Whiskey Run biking trails	Skill level in bicycling for recreation: Beginner (n = 7)	Novice (n = 33)	Intermediate (n = 114)	Expert (n = 57)	Total (n = 213)
Bike shops	0.0%	6.1%	14.9%	8.5%	11.3%
Word of mouth	85.7%	51.5%	39.5%	40.7%	43.2%
Internet	14.3%	9.1%	21.9%	27.1%	21.1%
I live nearby	0.0%	21.2%	8.8%	6.8%	9.9%
Mountain biker groups	0.0%	9.1%	12.3%	13.6%	11.7%
Highway signage	0.0%	3.0%	2.6%	3.4%	2.8%

Note: Chi-square = 17.91, df = 15, p-value = 0.27; n = sample size.

3.2.4: Mode of travel for bikers to the Whiskey Run trails

The data shows that most bikers drive cars to the Whiskey Run trails (*88.6%, see Figure 9 and Table 2-D in appendix 6.5*). The results (Table 5) show no statistical difference in responses from bikers when compared across skill levels. ($\chi 2 = 8.57$, $p > .05$). In other words, the level of skill in recreation biking does not influence how people travel to the Whiskey Run trails. These results show that car parking is likely to remain the most-needed major facility for bikers at Whiskey Run.

Considering that word of mouth is how most bikers learn about the Whiskey Run trails (*see Figure 8*), expanding and adding value to parking spaces at Whiskey Run trailheads is arguably worthwhile. Elsewhere, parking spaces are typically areas of potential recreation conflict in visitor use (Manning, 1999). Therefore, the management could separate parking locations for camping vans and recreational vehicles to minimize potential recreation conflict among bikers of divergent recreation interests.

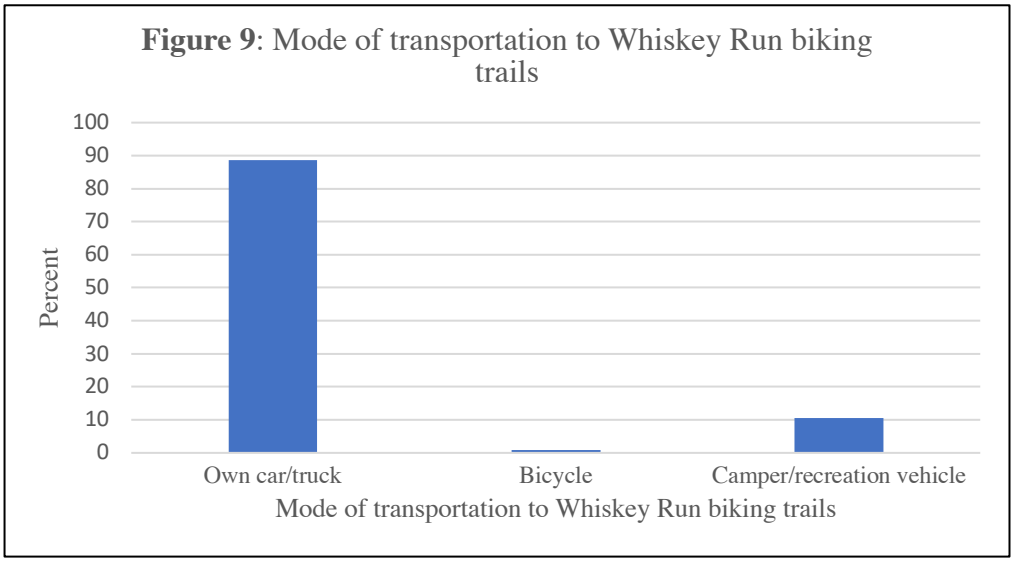


Table 5: Source of information about the Whiskey Run biking trails

Model of transportation to the Whiskey Run biking trails today	Skill level in bicycling for recreation				Total (n = 219)
	Beginner (n = 7)	Novice (n = 36)	Intermediate (n = 117)	Expert (n = 57)	
Own car/truck	100.0%	100.0%	86.3%	84.7%	88.60%
Bicycle	0.0%	0.0%	1.7%	0.0%	0.90%
Camper/recreational vehicle	0.0%	0.0%	12.0%	15.3%	10.50%

Note: Chi-square = 8.57, df = 6, p-value = 0.2; n = sample size.

3.2.5: Time bikers spend recreating at the Whiskey Run trails

The data shows that most bikers spend between two to four hours recreating at the Whiskey Run trails (43.6% *see Figure 10 and Table 2-E in appendix* 6.5). Whiskey Run also attracts a substantial number of bikers who spend between one and two hours (35.4%) and those who recreate for five or more hours (21%). The results (*Table 6*) show a significant statistical difference in responses from bikers when compared across skill levels ($\chi 2 = 19.51, p < .05$). In other words, the level of skill in recreation biking influences how much time bikers recreate at the Whiskey Run trails. According to Table 6, most novice bikers (66.7%) spend between one and two hours recreating at Whiskey Run, whereas most intermediate (43.1%) and expert bikers (55.1%) spend between three and four hours. These results show that the recreation behavior and needs of novice bikers' (*who tend to be local bikers within a radius of 50 miles, as shown in Table 3*) differ from intermediate and expert bikers. Novice bikers at Whiskey Run prefer shorter (*at most 2 hours*) rides and less difficult trails, whereas intermediate bikers prefer difficult trails and longer rides (*at least 3 hours*). Recreation management at the Whiskey Run trails system should emphasize both available miles of trails and difficulty in developing signage and promotion materials for the Whiskey Run trails.

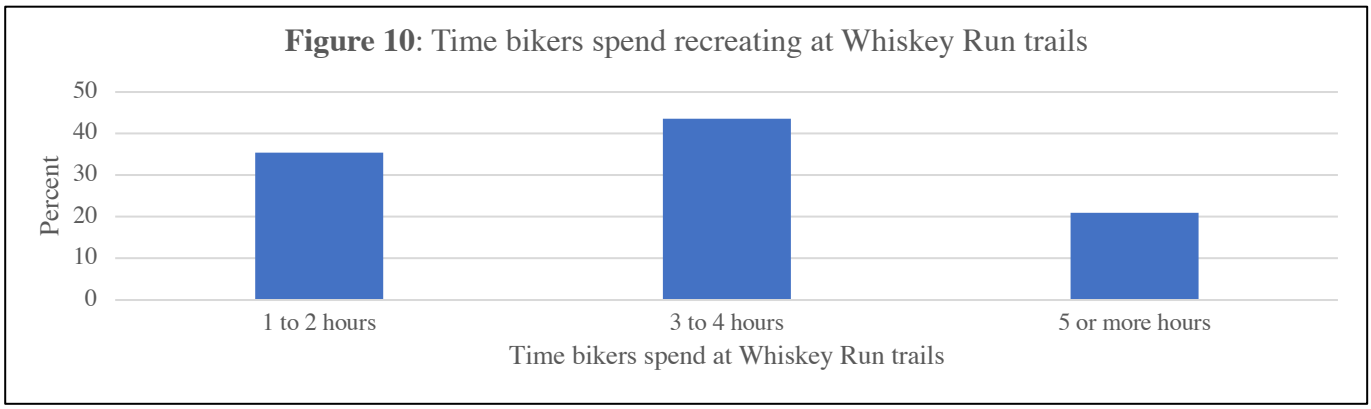


Table 6: Time bikers spend at the Whiskey Run biking trails

Time bikers spend at the Whiskey Run trails	Skill level in bicycling for recreation									
	Beginner (n = 7)		**Novice** (n = 30)		**Intermediate** (n = 109)		**Expert** (n = 49)		**Total** (n = 195)	
1 to 2 hours	3	42.9%	20	66.7%	34	31.2%	12	24.5%	69	35.4%
3 to 4 hours	2	28.6%	9	30.0%	47	43.1%	27	55.1%	85	43.6%
5 or more hours	2	28.6%	1	3.3%	28	25.7%	10	20.4%	41	21.0%

Note: chi-square = 19.51, df = 6, p-value = 0.03, Cramer's V (effect size) = 0.22; n = sample size.

3.2.6: Group size of bikers recreating at the Whiskey Run trails

The data shows that most bikers at the Whiskey Run trails recreate in groups of three to five people (40%) and groups of two (*30.7%, see Figure 11 and Table 2-F in appendix 6.5)*. Additionally, lone bikers account for about 26% of the bikers recreating at the Whiskey Run trails. The results (Table 7) show no statistical difference in responses from bikers when compared across skill levels ($\chi 2 = 10.72, p > .05$). In other words, the level of skill in recreation biking does not influence the group size of bikers recreating at the Whiskey Run trails.

These results indicate that the Whiskey Run trails arguably attract family bikers ranging from novice to expert. Therefore, considering the importance of word of mouth as a source of information for the Whiskey Run trails, recreation management should prioritize family-oriented recreation infrastructure/services (e.g., picnic benches, first aid kits) and riding experiences, such as the green-rated trails and accompanying lessons that the Whistler Bike Park offers for children and adults new to the sport (*see https://www.whistlerblackcomb.com/explore-the-resort/activities-and-events/whistler-mountain-bike-park/bike-school/kids-3-12/daily-group-lessons.aspx*).

It is advisable to emphasize the development and availability of such family-oriented biking recreation services and experiences on all signage and promotional materials for the Whiskey Run trails. The literature supports this suggestion by indicating the diverse motivations for mountain biking including solitude, skill development, and socialization (Schuett, 1997). The later recreation motivation for mountain bikers is attuned to the family-oriented rides suggested in this report for Whiskey Run.

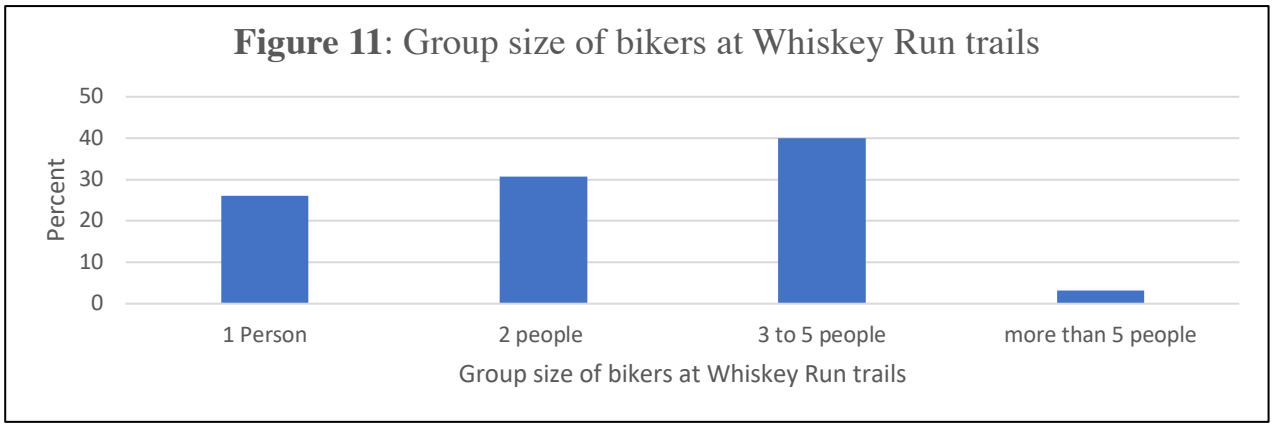


Table 7: Group size of bikers recreating at the Whiskey Run trails

Group size of bikers recreating at the Whiskey Run trails	Skill level in bicycling for recreation: Beginner (n = 7)	Novice (n = 35)	Intermediate (n = 114)	Expert (n = 59)	Total (n = 215)
1 person	0.0%	22.9%	24.6%	33.9%	26.0%
2 people	14.3%	25.7%	35.1%	27.1%	30.7%
3 to 5 people	85.7%	45.7%	37.7%	35.6%	40.0%
More than 5 people	0.0%	5.7%	2.6%	3.4%	3.3%

Note: Chi-square = 10.72, df = 9, p-value = 0.29; n = sample size.

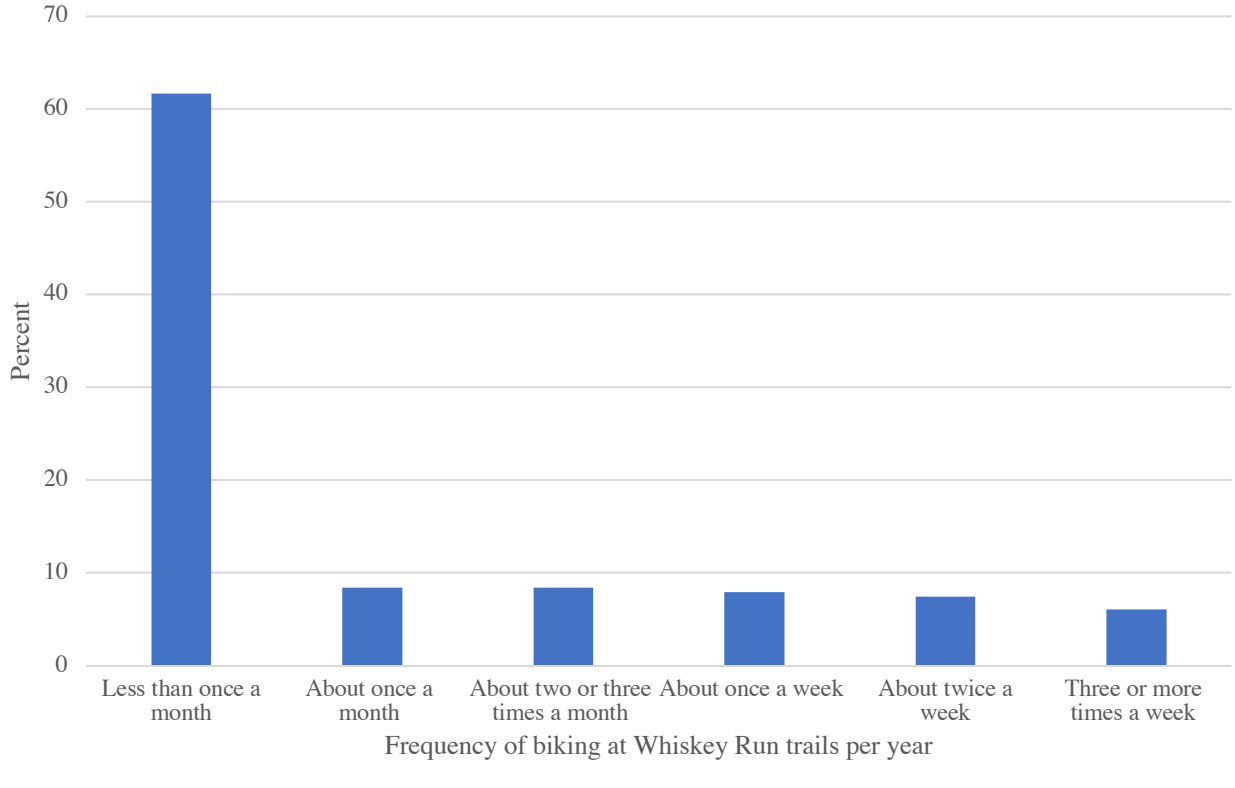
3.2.7: Frequency of biking visits to the Whiskey Run trails

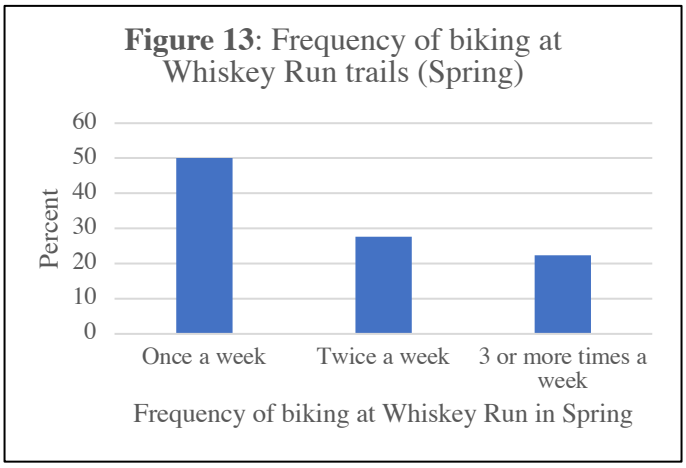
The data in Figure 12 and Table 8 suggests that most bikers at the Whiskey Run trails (61.5%) recreate less than once a month in a year (*i.e., about less than 12 times a year*). Additionally, most bikers recreate at the Whiskey Run trails (about once a week) in the fall, winter, spring, and summer seasons, as shown in Figures 13 to 16. In the summer, however, frequent visits of three or more times a week are typical compared to other seasons. When compared across skill levels, the results (Table 8) indicate no statistical difference in responses from bikers ($\chi 2 = 21.51$, $p > .05$).

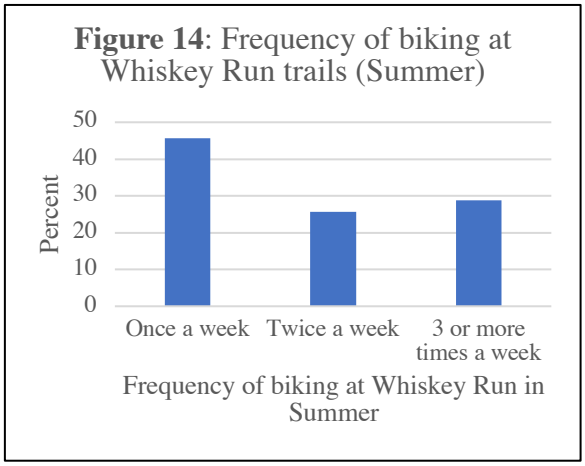
Similarly, the frequency of use in spring, winter, fall, and summer does not statistically differ based on skill level (*see details in Tables 2-K, 2-L, 2-M, and 2-N in Appendix 6.5*). In other words, the level of skill in recreation biking does not influence the frequency of bikers recreating at the Whiskey Run trails at any time of the year. These results indicate that bikers at the Whiskey Run trails arguably recreate during weekends and holidays regardless of skill level. The results presented

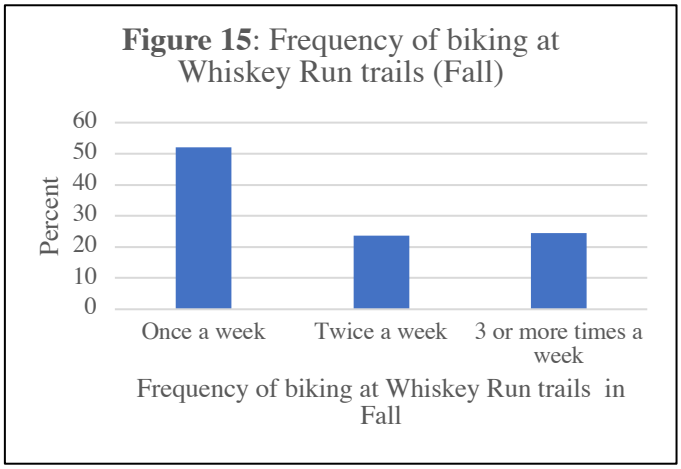
earlier in Figure 6, showing that most users travel between 100 and 300 miles, justify the results confirming the Whiskey Run trails to be a weekend and holiday destination for most mountain bikers. Therefore, the management of the Whiskey Run trails should plan to intensify trail servicing (*e.g., cleaning toilets, emptying trash cans*) during the weekend and holiday periods when use is most likely to be high. Trail maintenance activities (e.g., trail signage installations, new trail development, trail infrastructure repair) are arguably best conducted during weekdays when use is likely to be less. Trail maintenance could also be done during weekends with open invitations to the community to volunteer for trail build days. Trail build days can serve as an opportunity for the community to come together, and it is not uncommon for these events to culminate in barbecues/beverages. Such events illustrate the value of mountain biking in creating socio-psychological benefits for communities (*e.g., using biking events to enhance community bonding, cohesion, and sense of place;* Hagen & Boyes, 2016; Hill & Gomez, 2020).

Figure 12: Frequency of biking at Whiskey Run biking trails per year









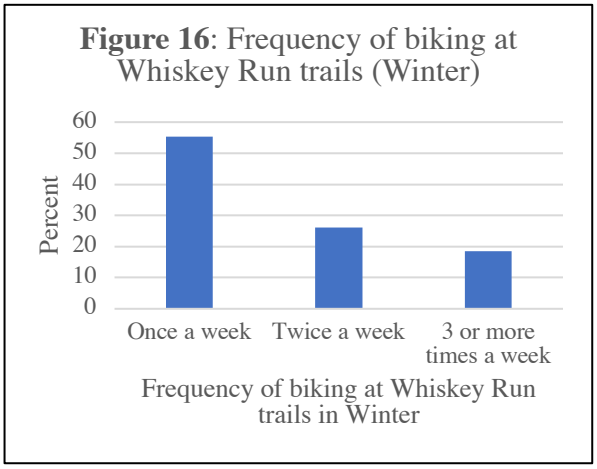


Table 8: Frequency of biking on the Whiskey Run trails in a year

	Skill level in bicycling for recreation				
Frequency of biking on the Whiskey Run trails in a year	**Beginner (n = 7)**	**Novice (n = 35)**	**Intermediate (n = 112)**	**Expert (n = 59)**	**Total (n = 213)**
Less than once a month (less than 12 times per year)	100.0%	48.6%	62.50%	62.70%	61.50%
About once a month (12 to 18 times per year)	0.0%	11.4%	8.00%	8.50%	8.50%
About two or three times a month (19 to 45 times per year)	0.0%	22.9%	8.00%	1.70%	8.50%
About once a week (46 to 80 times per year)	0.0%	8.6%	8.90%	6.80%	8.00%
About twice a week (81 to 130 times per year)	0.0%	2.0%	8.00%	10.20%	7.50%
Three or more times a week (over 130 times per year)	0.0%	5.7%	4.50%	10.20%	6.10%

Note: Chi-square = 21.51, df = 15, p-value = 0.12; n = sample size.

3.2.8: Satisfaction with biking experience at the Whiskey Run trails

Satisfaction with the biking experience at the Whiskey Run trails system is an important goal for both mountain bikers and the management. According to Mannell (1999), satisfaction in recreation is congruent to recreation expectations and experience. In this report, we view the satisfaction of the biking experience within the context of bikers' recreation expectations and perceived recreation experiences. Additionally, we also consider the importance attributed to mountain biking recreation. The recreation literature suggests that satisfaction with recreation is only meaningful to the management if they understand the importance of the evaluated recreation experience to a recreationist (Pierce et al., 2001). Therefore, this report assesses the perceived level of satisfaction with the biking experience at the Whiskey Run trails, along with biking recreation expectations, importance, and desired recreation experience outcomes.

According to Figure 17, respondents rated the satisfaction with recreation experience highly (*overall satisfaction rating score of 4.52, where 1 is low and 5 is high. See Table 2-O for satisfaction scale in Appendix 6.5*). When compared across varying skill levels of bikers, the data shows no statistical difference in how satisfied bikers are with the recreation experience at the Whiskey Run trails (*see Table 9*). However, the comparative results of rating for the importance of biking recreation show a significant statistical difference in responses by skill level ($F = 4.43$, $p < .001$). For example, Figure 18 illustrates that biking for recreation is more important (*rating score of 6.54, where 1 is low, and 7 is high*) to experts than novice bikers (*rating score of 5.66*). Additionally, according to the cognitive appraisal theory (Lazarus, 1991), the satisfaction in bicycling recreation is likely a function of recreation goal congruence and the magnitude of positive emotions evoked in people by their recreation experiences. The results presented in Table 9 demonstrate that the biking experience at the Whiskey Run trails satisfies the desires and expectations of all bikers regardless of the skill level and that post-recreation feelings are very positive among all types of bikers.

Together, these results show that the recreation experience and services offered to bikers at the Whiskey Run trails are satisfactory and highly appreciated by bikers who consider mountain biking to be of utmost importance. These results instill confidence in recreation managers that they are developing and providing a desirable, satisfactory mountain biking experience at the Whiskey Run

trails. The suggestions made elsewhere in the report to improve the quality of the recreation experience at the Whiskey Run trails would enhance the current satisfactory experience of biking for recreation.

Figure 17: Satisfaction with biking at Whiskey Run trails

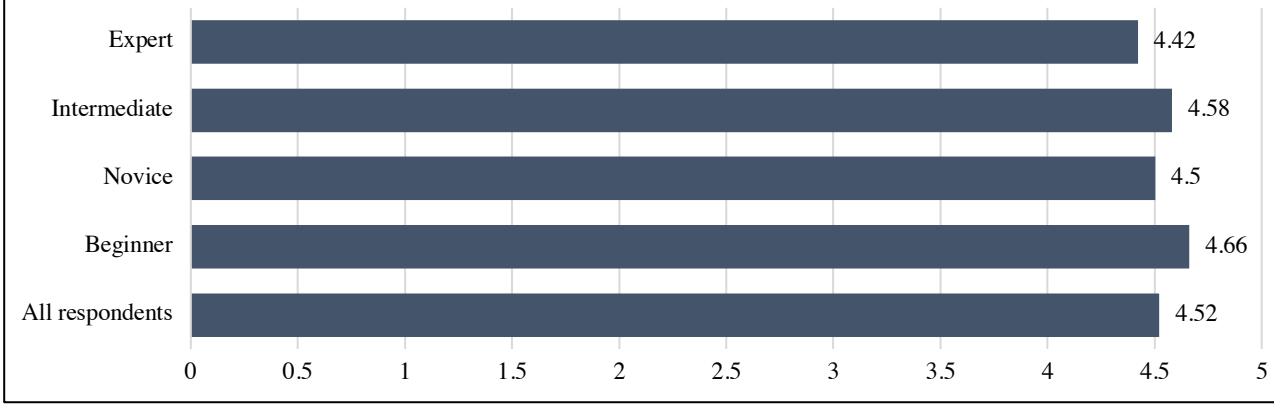
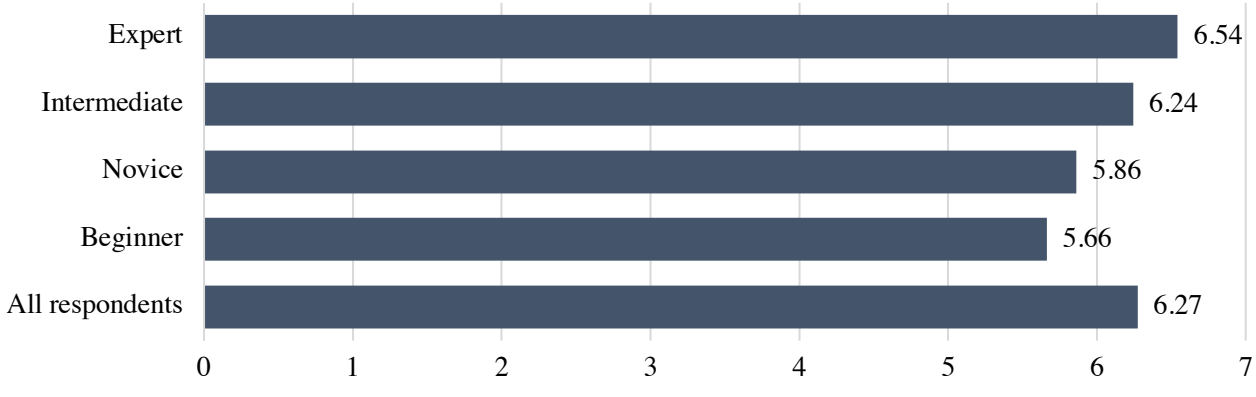


Figure: 18: Importance of biking in nature trails



Satisfaction with bicycling recreation experiences	All respondents	Skill level in bicycling for recreation						
		Beginner	Novice	Intermediate	Expert	F	p	Eta (η)
Importance of biking in nature[1]	6.27	5.66	5.82	6.24	6.54	4.43	0.00	0.23
Satisfaction with biking experience at the Whiskey Run trails[2]	4.52	4.66	4.50	4.58	4.42	1.65	0.18	N/A
Bicycling recreation goal congruence[3]	5.92	5.45	5.73	6.02	5.88	1.19	0.32	N/A
Positive emotional feeling outcomes[4]	4.04	4.00	3.89	4.11	3.98	1.02	0.39	N/A

Note: [1] *7-point importance scale (1= low importance, 7 = high importance);* [2] *5-point agreement scale (1 = strong disagreement, 5 = strong agreement);* [3] *7-point congruence scale (1 = lowest level of goal incongruence, 7 highest level of goal congruence):* [4] *5-point scale feelings occurrence scale (1 = never, 5 = always).*

3.2.9: Potential of bikers to revisit or recommend biking at the Whiskey Run trails

The results presented earlier (*see Figure 8*) indicate that word-of-mouth recommendation is the primary source of information for bikers about the Whiskey Run trails. Therefore, while Figure 17 illustrates highly satisfactory biking experiences, it is also essential for recreation managers to understand the extent to which bikers are likely to revisit and recommend the Whiskey Run trails to other bikers. As the results in Table 10 show, all bikers at the Whiskey Run trails agree with the statement that they are likely to revisit the trails (mean = 4.18, SD = 0.64). Similarly, as shown in Table 11, the likelihood of recommending the trails to other bikers is high (mean = 4.6, SD = 0.7). When compared across varied bicycling skill levels, results do not reflect a statistical difference ($F = 1.31$, $p > .05$). These results indicate that regardless of skill level, bikers at the trails value the quality of recreation experiences and are more likely to revisit.

Group difference results show a significant but minor difference in responses about the likelihood of recommendation by skill level ($F = 2.96$, $p < .05$, eta = .22). The post-hoc test shows that the difference in the likelihood of recommendation is between beginners (mean = 3.8, SD =1.64) and intermediate bikers (mean = 4.7, SD = 0.7; mean difference of -.9 with a standard error of .31 is significant at the 95% confidence level). In other words, intermediate bikers are more likely to recommend the Whiskey Run trails compared to beginners. Therefore, these results show that the appeal of the trail for recreation remains secure, considering that a) intermediate bikers found to be most likely to recommend the Whiskey Run trails are the most frequent recreators here (*see Figure 5*), and b) word-of-mouth recommendation is how most bikers learn about the trails (see Figure 8). According to these findings, to maintain the appeal of the trails, the management arguably needs to closely attend to the recreation needs of intermediate and expert bikers, who appear to be the major segments of the mountain bikers' market for the trails.

Table 10: Likelihood of revisiting the Whiskey Run trails for bicycling recreation

Skill level in bicycling for recreation	N	Mean	Std. Deviation	95% Confidence Interval for Mean		F-Statistic	Sig.
				Lower Bound	Upper Bound		
Beginner	5	4.16	0.09	4.05	4.27	1.31	0.28
Novice	27	4.40	0.52	4.20	4.60		
Intermediate	97	4.16	0.68	4.02	4.30		
Expert	47	4.11	0.64	3.92	4.30		
All respondents	176	4.18	0.64	4.09	4.28		

Note: Means are based on a 5-point agreement scale, where 1 = strongly disagree with the likelihood of revisiting and 5 = strongly agree with the likelihood of revisiting

Table 11: Likelihood of recommending the Whiskey Run trails for bicycling recreation

Skill level in bicycling for recreation	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Statistical Test of Group Difference		
				Lower Bound	Upper Bound	F-Statistic	Sig.	Effect size (eta)
Beginner	5	3.8	1.64	1.76	5.84	2.96	0.03	.22
Novice	26	4.6	0.6	4.4	4.8			
Intermediate	97	4.7	0.6	4.6	4.8			
Expert	45	4.6	0.8	4.3	4.8			
All respondents	173	4.6	0.7	4.5	4.7			

Note: Means are based on a 5-point agreement scale, where 1 = strongly disagree about the likelihood of recommending and 5 = strongly agree about the likelihood of recommending

3.3 Recreation Attributes of the Whiskey Run Trails

Respondents were asked for opinions on Whiskey Run's recreation attributes. Notably, they were asked how they feel about the available recreation facilities and service at the Whiskey Run trails to determine the most critical needs that the management can prioritize. Survey participants responded by indicating

1) the most important recreation facilities,
2) the extent to which they support important recreation services (e.*g., food and lodging*),
3) the mode of increase in biking recreation at the Whiskey Run trails from each of the suggested services,
4) the level of support for alternative funding for trails maintenance costs,
5) the level of support for various trail management actions currently under consideration, and
6) the likely increase in biking recreation at the Whiskey Run trails from the most-supported management actions.

According to the recreation attributes framework, these questions represent site-based recreation attributes (Ewert & Hollenhorst, 1994). According to the recreation specialization theory, an increase in recreation skill level is positively associated with site-based recreation attributes influencing recreation participation, behavior, and motivation (Ewert & Hollenhorst, 1994; Lee et al., 2007). Considering that mountain biking is a highly specialized recreation activity, this study aimed to understand the extent to which the opinions of bikers regarding site-based attributes (*e.g., recreation facilities and services*) differ by skill level (Lee et al., 2007). Similarly, about 37% of the sample of 409 respondents in this study have not recreated at the Whiskey Run trails.

Therefore, before comparing respondents' opinions by skill level, we compared responses between bikers who have been and those who have not been to the Whiskey Run trails to exclude potential bias in opinions of those who have not experienced the rated site-based recreation attributes. In the following subsections, we summarize the opinions of mountain bikers regarding the selected site-based recreation attributes. This information is likely to guide the management in investing resources in recreation facilities and services with the most potential to increase riding and enhance the recreation experience at Whiskey Run.

3.3.1 Perceived importance of mountain biking recreation facilities

Figure 19 (*see Table 3-A for details*) shows two very important recreation facilities to mountain bikers: the expanded parking space at trailheads (mean = 4.76, SD = 0.50; response scale ranged between 1 for not important and 5 for very important) and installation of more and clear directional signs within trails (mean = 4.54, SD = 0.77). The data also reveals four recreation facilities important to mountain bikers: providing directional signs to trails (mean =4.28, SD = 0.99), installing information signage (mean = 4.14, SD = 0.98), providing trash cans (mean = 4.19, SD =1.08), and installing pit toilets (mean = 4.02, SD = 1.11). Notable is the finding that the camping facility is somewhat important to mountain bikers (mean = 3.39, SD = 1.43). When compared across bikers who have been to the Whiskey Run trails and those who have not, the results do not differ statistically for most facilities. The only two statistically significant differences in opinion about shuttle service and directional signs to the trails were too negligible to raise concern for bias associated with combining the responses of bikers who have been to Whiskey Run and those who have not (*see Table 3-A in Appendix 6.6 for details*).

Additionally, respondents' opinions regarding the importance of recreation facilities were compared by recreation bicycling skill level (*beginner, novice, intermediate, and expert*). Figure 20 (see Table 3-B in Appendix 6.6 for details) shows a significant relationship between the skill level and the perceived importance of the following recreation facilities: pit toilets, rinse stations, bike racks with electric charging stations, bike racks without electric charging stations, bike rental and repair service, lodging services, camping services, directional signs within trails, and directional signs to trails. However, the strength of these relationships ranged from minimal (effect size = 0.15) to typical (effect size = .25), suggesting that some of these differences in opinions are unimportant (Vaske, 2008).

A closer look at where the difference in opinions about facilities is across four groups of bikers, using Tamhene's post-hoc tests, reveals several differences (see Figure 20). For example, the perceived importance of pit latrines is higher among beginner bikers (mean = 4.71, where 5 is a maximum score of importance) compared to experts (mean = 3.88; mean difference = .84, $p < .01$ that is, the mean difference of .84 is statistically significant at the 99% confidence level). Similarly,

the perceived importance of rinse stations is higher among beginners (mean = 3.43) compared to expert bikers (mean = 2.21; mean difference = 1.22, $p < .05$). The importance of bike racks with electric charging stations is also relatively higher (mean = 2.79) compared to novice bikers (mean = 1.57; mean difference = 1.45, $p < .01$). The importance of bike racks without electric charging stations is higher among beginners (means = 3.15) compared to expert bikers (mean = 2.01; mean difference = 1.14, $p < .05$). The perceived importance of bike rental and repair services is higher among beginners (mean = 3.07) compared to intermediary bikers (mean = 2.06; mean difference = 1.01, $p < .05$). Finally, the perceived importance of camping services is higher among the expert bikers (mean = 3.88) compared to novice bikers (mean = 2.73; mean difference = 1.13, $p < .001$), and the expert's desire for camping services is higher compared to intermediate bikers' (mean = 3.32; mean difference = .53, $p < .01$).

Together, the above group difference results (*summarized in Figure 20 for simplicity*) reveal two key pieces of information. First, recreation facilities, including the expansion of vehicle parking spaces, provision of trash cans, installation of information signs for guidelines, and installation of directional signs within the trails and also at the trail entrance, at Whiskey Run are highly desirable across all four skill level groups of bikers. These facilities should be prioritized, considering that all users desire them. Second, a few recreation facility needs vary based on the skill level of recreation bicycling. For example, the perceived importance of pit latrines is significantly higher among beginners than more experienced biking groups, who also indicate pit latrines to be important.

In contrast, the desire for camping services is significantly higher among more experienced biking groups (expert and intermediary) than the less experienced (e.g., novice). Considering that experienced bikers account for over 80% of bikers who recreate at the Whiskey Run trails, providing camping services is highly recommended to enhance the recreation experiences of the market segment most attracted to Whiskey Run. Additionally, all trailhead parking spaces at the Whiskey Run trails should be equipped with pit latrines. Based on the findings presented, these infrastructure development suggestions are likely to create, enhance, and sustain high-quality recreation experiences for both skilled and unskilled mountain bikers.

Figure 19: Perceived importance of recreation facilities at Whiskey Run trails
(3 = Neutral, 4 = Important, 5 = Very Important)

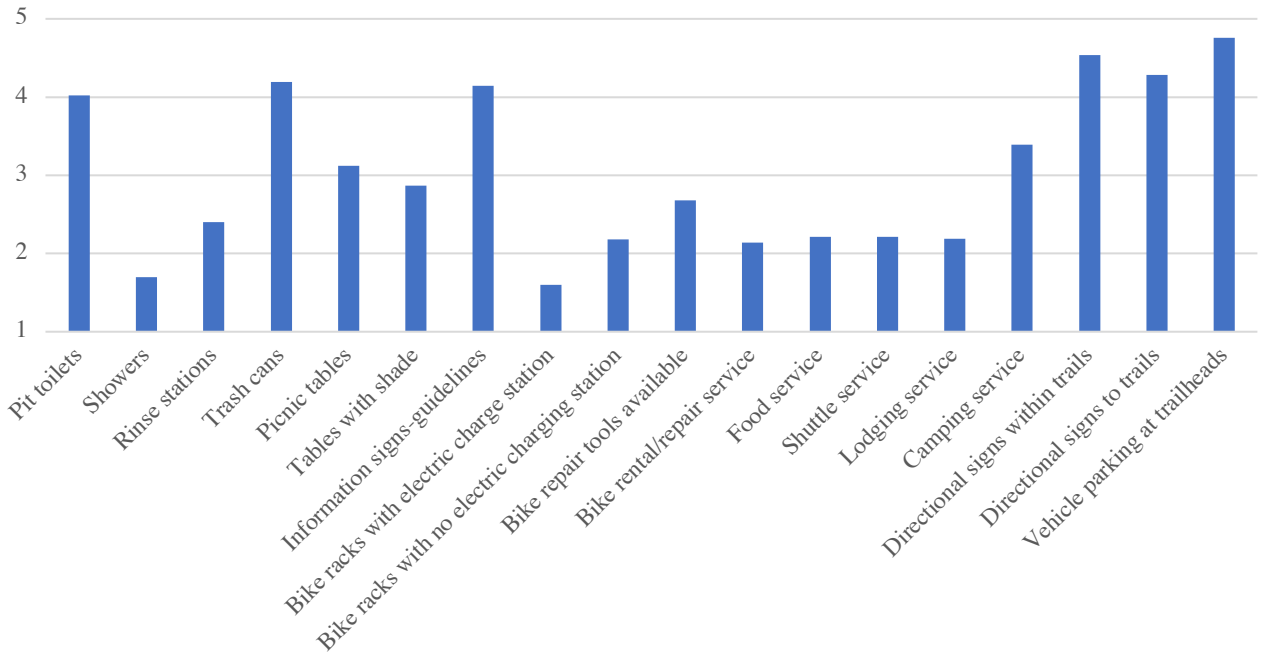
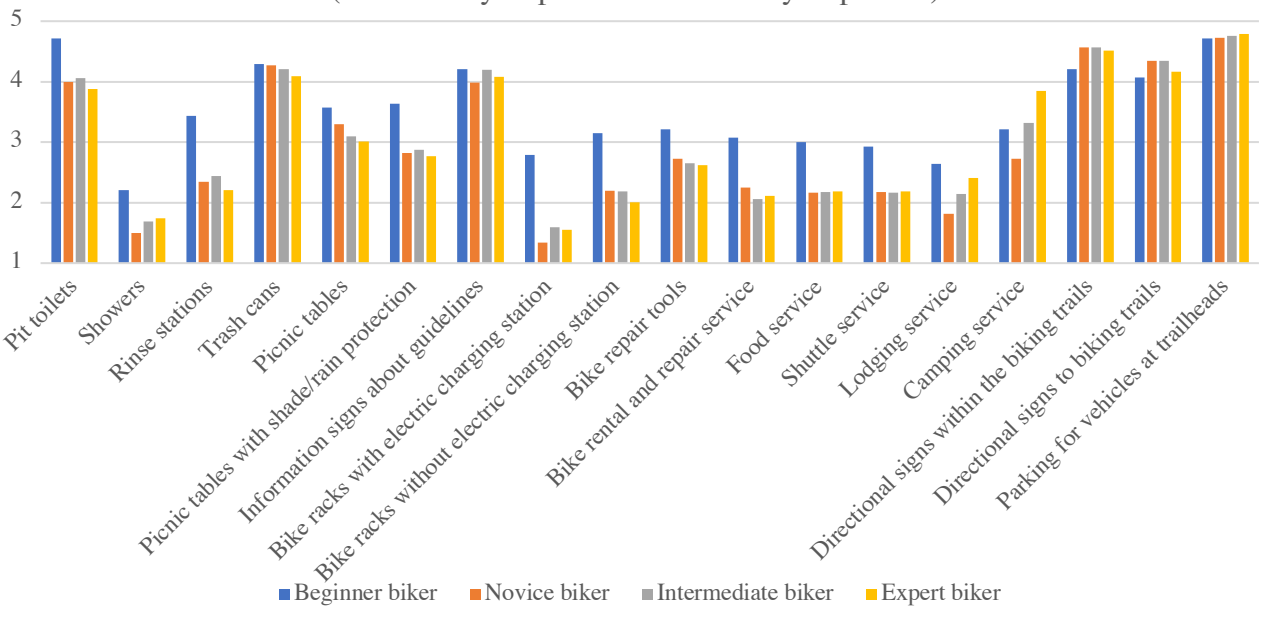


Figure 20: Comparison of perceived importance of facilities by skill level
(1 = not very important and 5 = very important)



3.3.2 Perceived support for information, lodging, and food services

The results presented in Figure 21 (*see Table 3-C in the appendix for details*) show strong support for restrooms at trailheads (mean = 4.47; maximum score is 5), information kiosks (mean = 4.01), recreational vehicle parks, camping areas (mean = 3.88), and a tent campground with bathrooms at trailheads (mean = 3.78). When compared across bikers who have been to the Whiskey Run trails and those who have not, the results show no statistical difference for most services and negligible differences in three services (i.e., Cohen's d effect sizes ranging from 0.25 to 0.27): restrooms at trailheads, tent campground with bathrooms at trailheads, and lodging services. The opinion about information kiosks had only one moderately statistically significant difference ($t = 4.83$, $p < .001$, effect size of 0.53). A moderate effect size result indicates that, as expected, bikers who have been to the Whiskey Run trails are moderately less concerned about information services (Mean = 3.80) compared to bikers who have not (mean = 4.22; *See Table 3-C in Appendix 6.6 for details*). Therefore, considering a moderate difference in support for services on the information kiosk, which is expected, and substantial support for the information kiosk in both groups, combining the opinions of all respondents is appropriate.

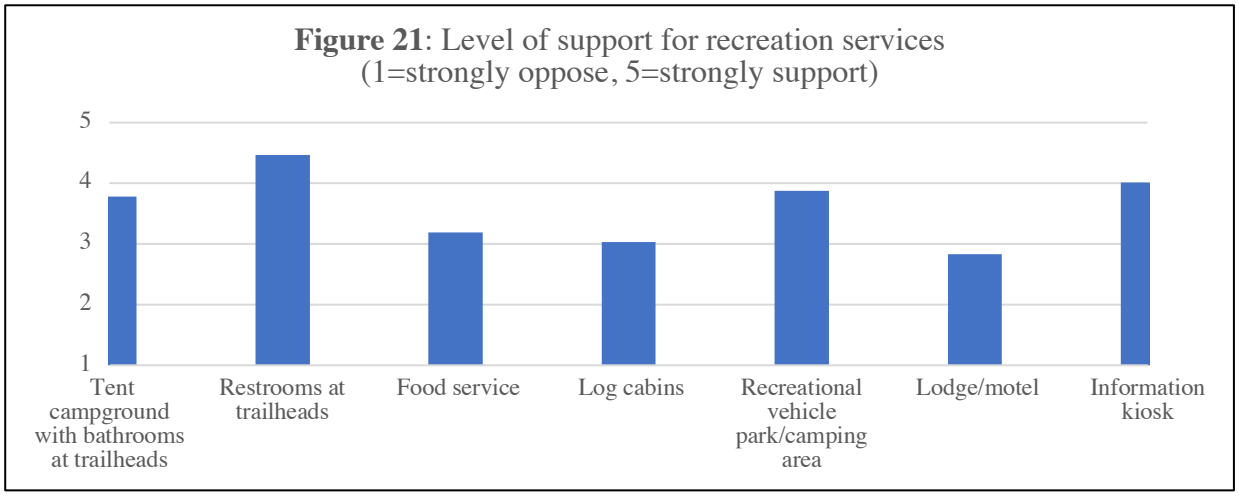


Figure 21: Level of support for recreation services (1=strongly oppose, 5=strongly support)

Additionally, respondents' opinions regarding the support for recreation services were compared by recreation bicycling skill level (beginner, novice, intermediate, and expert recreation bikers). Results in Figure 22 (*see Table 3-D in Appendix 6.6 for details*) show a significant relationship between the level of skills and the support of the following recreation services: information kiosks ($F = 3.75$, $p < .05$, effect size = .12), recreational vehicle parks/camping areas ($F = 3.34$ $p < .05$, effect size = .20), and tent campgrounds with bathrooms at trailheads ($F = 4.38$, $p < .05$, effect size

= .20). The effect sizes (Eta/η) above show that the differences are typical. The support for information kiosk, recreational park/camping area, and the tent campground at trailheads is less surprising and increases with an increase in skill level.

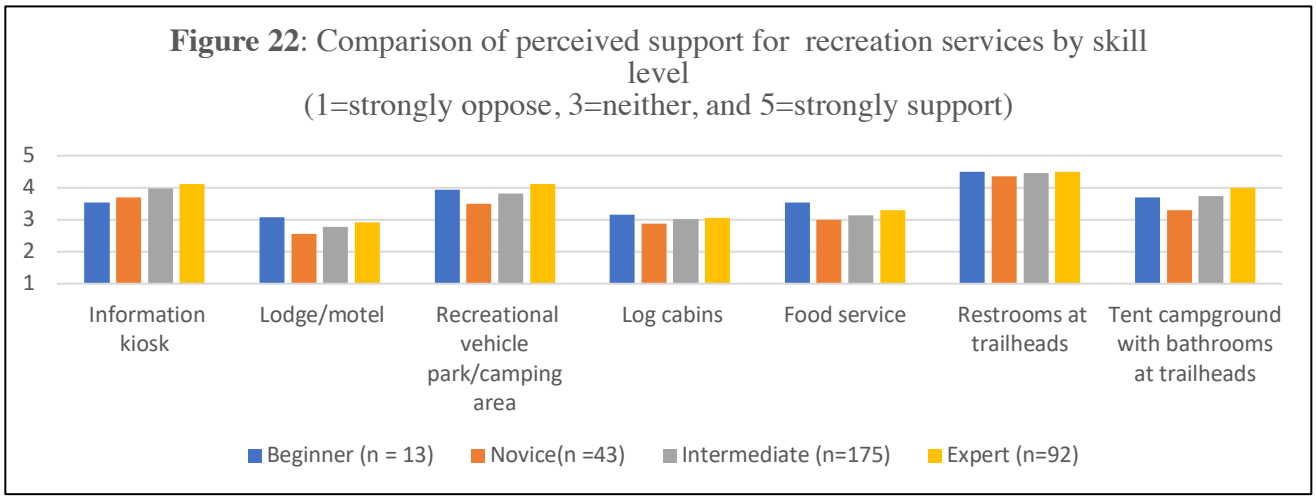


Figure 22: Comparison of perceived support for recreation services by skill level
(1=strongly oppose, 3=neither, and 5=strongly support)

Finally, we examined whether establishing the most-desired recreation services outlined above would increase bicycling recreation at the Whiskey Run trails. In other words, would the installation of the most-supported recreation services increase recreation bicycling at the trails? The results in Figure 23 (*see details in Table 3-E in Appendix 6.6*) show that the discussed recreation services, namely, creating restrooms at trailheads, tent campgrounds with bathrooms at trailheads, and recreational vehicle parks/camping areas, would likely slightly increase bicycling recreation at the trails, especially among experienced bikers. Notable, however, is the finding that beginner bikers are more sensitive to the availability of restrooms at trailheads (*see Figure 23*).

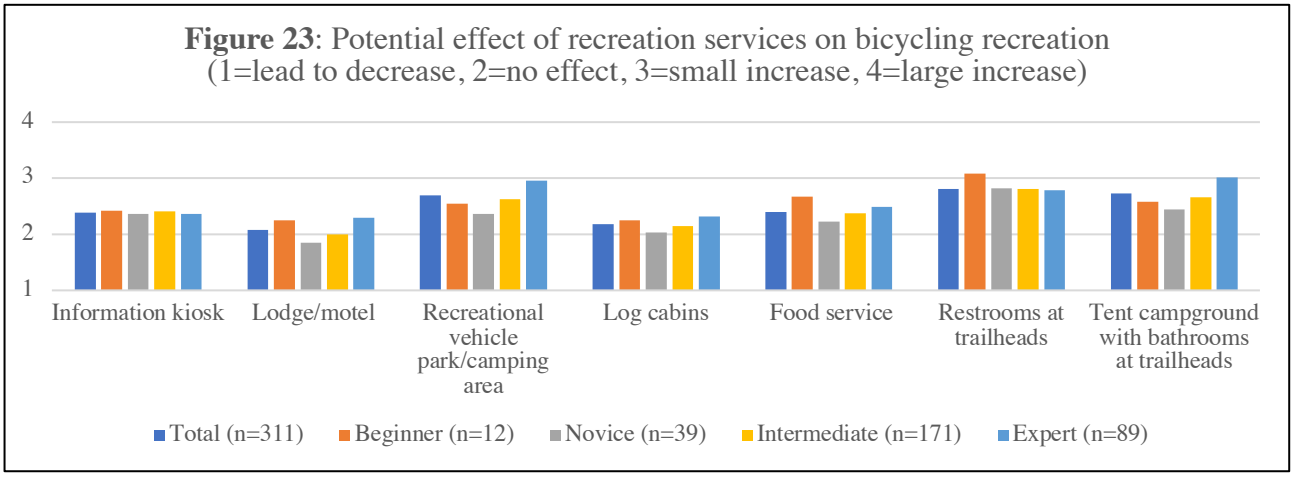


Figure 23: Potential effect of recreation services on bicycling recreation
(1=lead to decrease, 2=no effect, 3=small increase, 4=large increase)

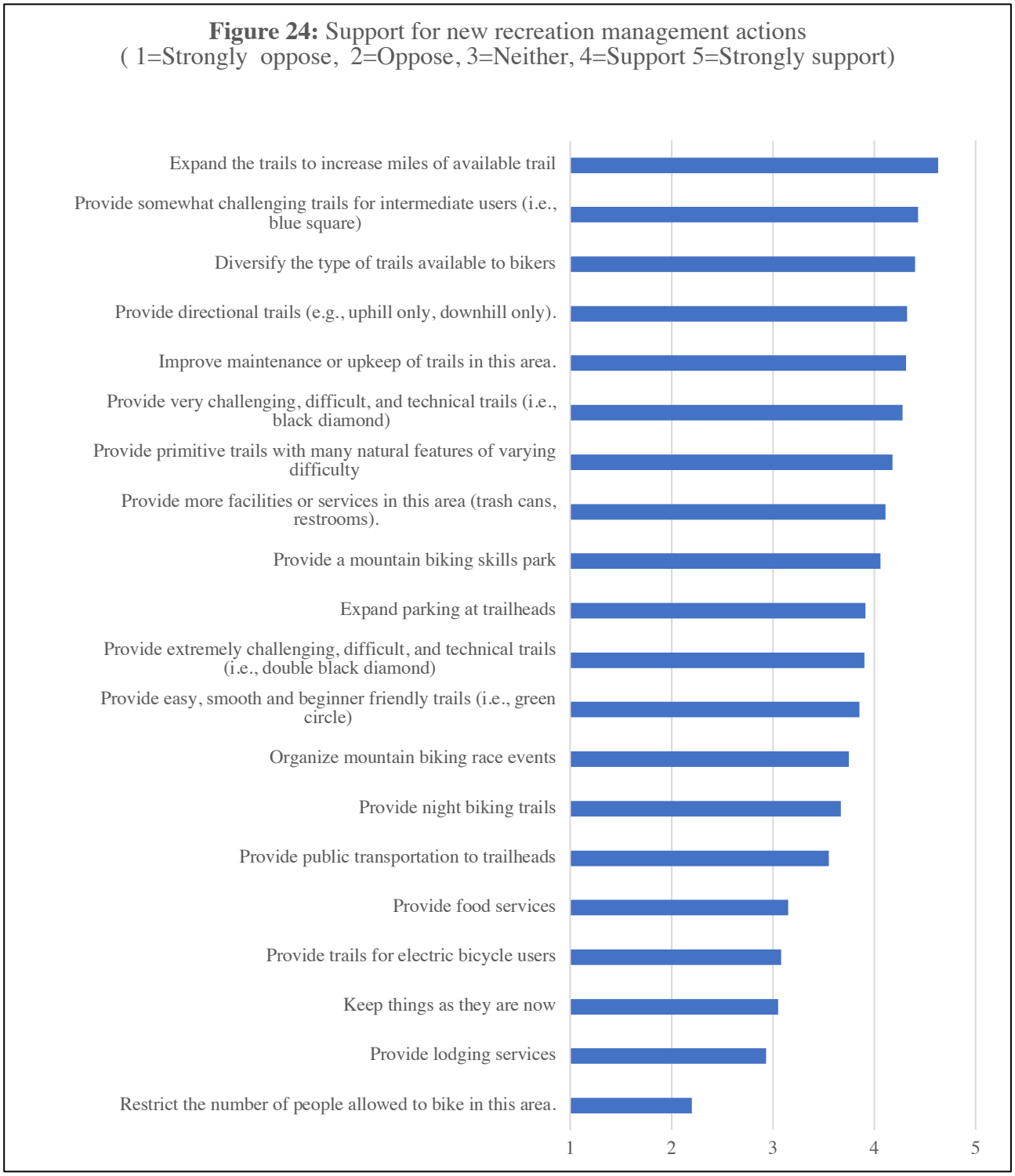
Together, the above group difference results (*shown in Table 3-D in Appendix 6.6 and summarized in Figure 22 above for simplicity*) reveal two key pieces of information. First, support for restrooms at trailheads is highly desirable across all four skill-level groups of bikers. Therefore, bathrooms should be installed at all trailheads of the Whiskey Run trails. Second, the comparison results show that highly skilled bikers support services such as information kiosks, recreational vehicle parks or camping areas, and tent campgrounds with bathrooms at trailheads much more than unskilled bikers do. Therefore, considering that experienced bikers form a significant portion (80%) of the Whiskey Run trail users (*see Figure 5*), installing information kiosks is recommended at all trailheads. A camping facility (whether a tent campground or recreational vehicle park with bathrooms) should be set up not too far from the trailheads but out of sight from the parking area at trailheads to minimize perceived crowding and visitor use conflict issues (Manning, 1999). Based on the findings presented, these recreation service recommendations are likely to increase recreation bicycling at the Whiskey Run trails and enhance recreation experiences for skilled and unskilled mountain bikers.

3.3.3 Level of support for new recreation management actions

Results presented in Figure 24 (*see Table 3-F in Appendix 6.6 for details*) show strong support for expanding the available trails at Whiskey Run to increase the mileage (mean = 4.63; *maximum score is 5*). The results also reveal moderate support for the following recreation management actions: providing somewhat challenging trails for intermediate users or blue square trails (mean = 4.43); diversifying the type of trails available to bikers (mean = 4.4); providing directional trails, for example, uphill only or downhill only trails (mean = 4.32); improving the maintenance or upkeep of trails (mean = 4.31); providing very challenging, difficult, and technical trails or black diamond trails (mean = 4.28); providing primitive trails with many natural features of varying difficulty (mean = 4.18); providing more facilities or services such as trash cans and restrooms (mean = 4.11); and providing a mountain biking skills park (mean = 4.06). When compared across bikers who have been to the Whiskey Run trails and those who have not, the results demonstrate no statistical difference for most recreation management actions. Where differences are evident (i.e., *expanding parking at trailheads and keeping things as they are, as shown in Table 3-F Appendix 6.6*), they are negligible (*i.e., small Cohen's d effect sizes of about 0.3*). Therefore, considering a small difference

in opinions on management actions that are less supported by most respondents, as shown in Figure 24, combining the opinions of all respondents is appropriate.

Figure 24: Support for new recreation management actions
(1=Strongly oppose, 2=Oppose, 3=Neither, 4=Support 5=Strongly support)



Furthermore, the support for recreation management actions was compared across recreation bicycling skill levels (beginner, novice, intermediate, and expert recreation bikers). The results, as presented in Figure 25 (*see Table 3-G in Appendix 6.6*), suggest a significant relationship between the level of skills and support for the following most-supported recreation management actions: expanding the trails to increase the miles of available trail ($F = 4.63$, $p < .001$, effect size $\eta = .26$), providing somewhat challenging trails for intermediate users or blue square trails ($F = 4.33$, $p < .05$, effect size $\eta = .21$), diversifying the type of trails available to bikers ($F = 2.66$, $p < .05$, effect size $\eta = .17$), providing very challenging, difficult, and technical trails or black diamond trails ($F = 12.43$, $p < .001$, effect size $\eta = .34$), providing primitive trails with many natural features of varying difficulty ($F = 8.99$, $p < .001$, effect size $\eta = .3$), and providing a mountain biking skills park ($F = 4.01$, $p < .05$, effect size $\eta = .2$). These results show that the management's action to expand trails to increase miles and provide primitive trails with many natural features would be supported across all skill levels, but most significantly among skilled bikers (expert and intermediary bikers). Similarly, the results in Figure 25 (*and Table 3-H in Appendix 6.6*) show that the level of support of all management actions outlined above is higher among skilled bikers than less-skilled bikers. The rest of the supported management actions (*e.g., providing more facilities, improving maintenance of trails, providing directional trails*) were equally supported by all bikers regardless of bicycling recreation skill level.

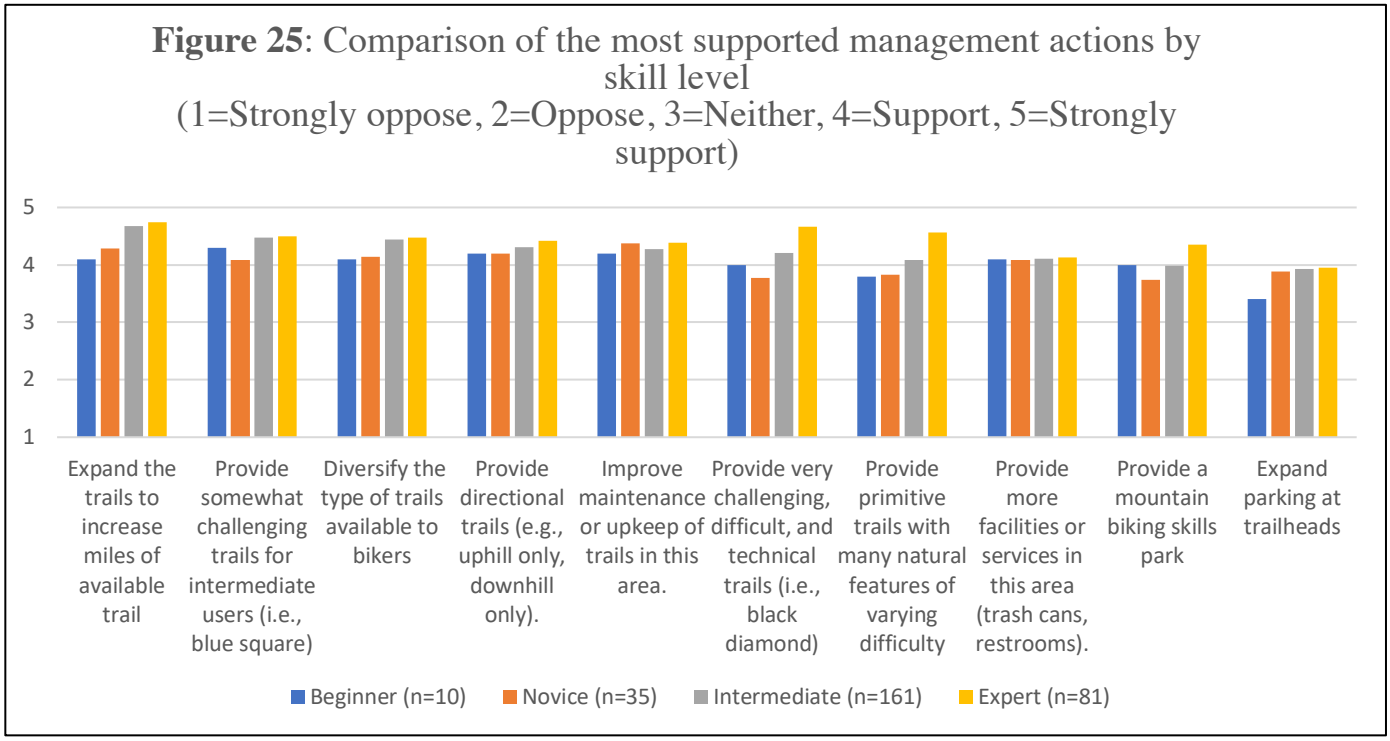


Figure 25: Comparison of the most supported management actions by skill level
(1=Strongly oppose, 2=Oppose, 3=Neither, 4=Support, 5=Strongly support)

Finally, we examined whether the proposed recreation management actions would increase bicycling recreation at the Whiskey Run trails. The results presented in Table 12 below show the following recreation management actions: expanding the trails to increase miles, diversifying the type of trails available to bikers, providing somewhat challenging trails for intermediate users or blue square trails, improving trail maintenance, providing difficult or black diamond trails, and providing primitive trails with more natural features are likely to lead to a some increase in bicycling for recreation at the Whiskey Run trails. Specifically, expanding trail miles, providing difficult trails, and providing primitive trails with natural features will likely increase recreation use among skilled bikers.

Table 12: Potential effect of top-ranked management actions on bicycling recreation

Top-ranked management actions		**Skill level in bicycling for recreation**						
	Total	Beginner	Novice	Intermediate	Expert	F	Sig.	Eta(η)
Expand the trails to increase miles	3.4	3.0[b]	3.2[b]	3.3[b]	3.6[a]	4.76	0.003	0.226
Provide somewhat challenging trails for intermediate users (known as blue square)	3.0	3.2	2.8	3.1	2.9	1.74	0.16	0.14
Diversify the type of trails available to bikers	3.2	3.0	3.0	3.2	3.3	2.16	0.09	0.15
Provide directional trails (e.g., uphill only, downhill only).	2.6	2.7	2.6	2.6	2.7	0.22	0.89	0.05
Improve maintenance or upkeep of trails in this area.	2.9	3.0	3.1	2.9	3.0	1.18	0.32	0.12
Provide very difficult and technical trails (known as black diamond)	2.9	2.6	2.4[b]	2.8[b]	3.3[a]	14.63	<.001	0.38
Provide primitive trails with many natural features of varying difficulty	2.9	2.6[b]	2.6[b]	2.9	3.2[a]	5.51	0.001	0.24
Provide more facilities or services in this area (trash cans, restrooms, picnic tables).	2.7	3.0	2.8	2.7	2.7	0.58	0.63	0.08
Provide a mountain biking skills park	2.8	2.8	2.8	2.8	2.9	0.23	0.87	0.05
Expand parking at trailheads	2.6	2.6	2.6	2.6	2.7	0.13	0.94	0.04

Note: *Means are based on a 4-point scale, where 1 = lead to decrease in bicycling at the Whiskey Run trails, 2 = no effect, 3 = lead to a small increase in bicycling at the trails, 4 = lead to a large increase in bicycling at the trails. Tamhane's post-hoc tests show that bicycling recreation among skilled bikers (e.g., expert bikers) is likely to increase at the trails compared to less-skilled bikers (e.g., novices) from management actions to expand trail miles (mean difference = .4, $p < .05$), providing difficult trails (mean difference = .95, $p < .001$), and providing primitive trails (mean difference = .58, $p < .001$). Means with superscript a are significantly higher than means with superscript b.*

Furthermore, support for and the effect of each management action for each skill level is examined considering that a) the above results are skewed toward the opinions of skilled bikers (*intermediate and expert*) who represent a large portion of the current market of bikers for the Whiskey Run trails and that b) the unskilled bikers (*beginners and novices*) represent a potential market growth

opportunity, especially among the local bikers. Figures 26 to 29 below reveal a nuanced support trend for management actions among skilled and unskilled bikers.

Figure 26: Support for new recreation management actions among the beginner bikers
(1=Strongly oppose, 2=Oppose, 3=Neither, 4=Support, 5=Stronly support)

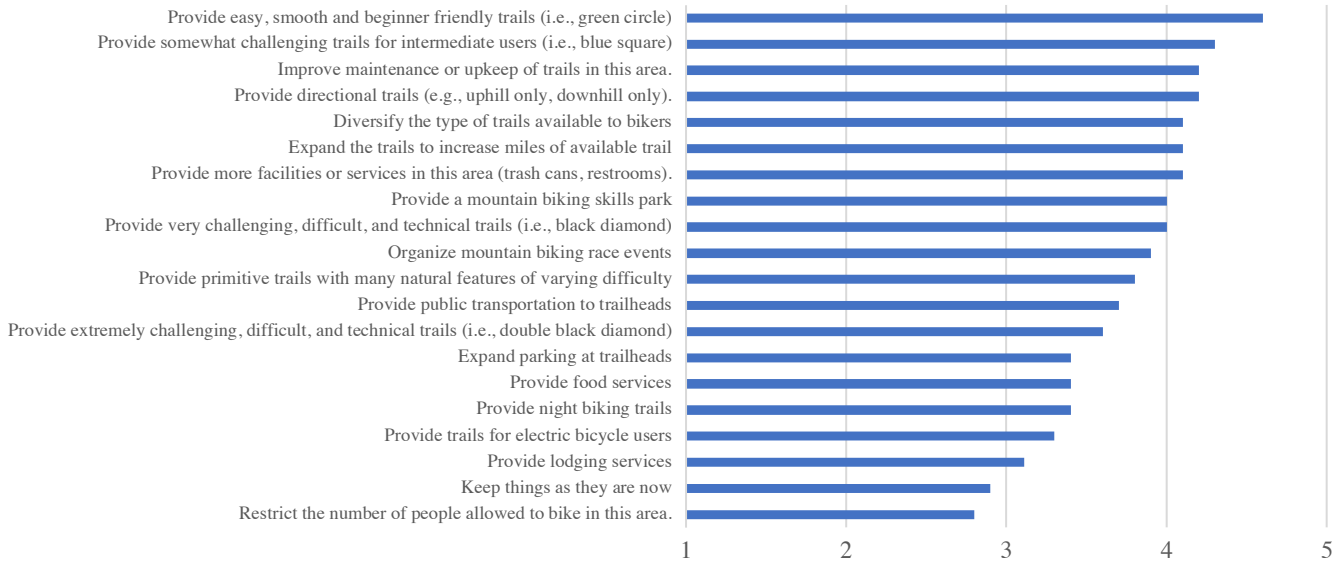


Figure 27: Support for new recreation management actions among the Novice bikers
(1=Strongly oppose, 2=Oppose, 3=Neither, 4=Support, 5=Stronly support)

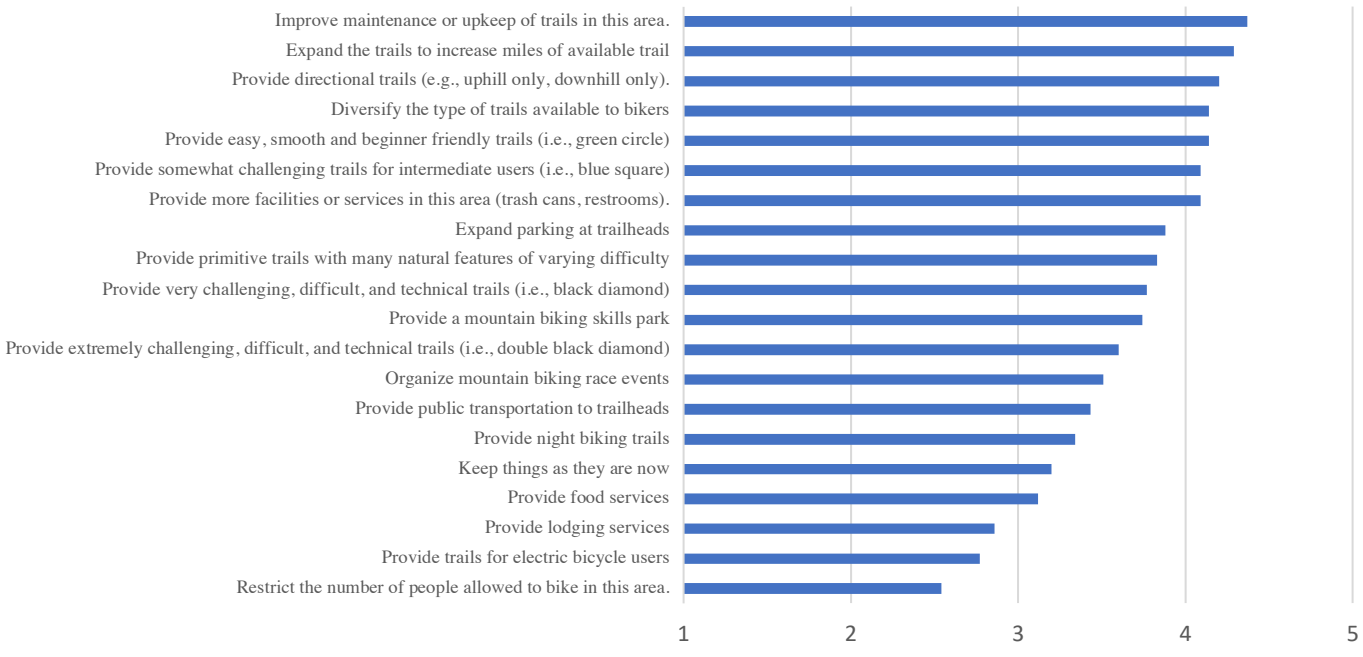


Figure 28: Support for new recreation management actions among the intermediate bikers
(1=Strongly oppose, 2=Oppose, 3=Neither, 4=Support, 5=Stronly support)

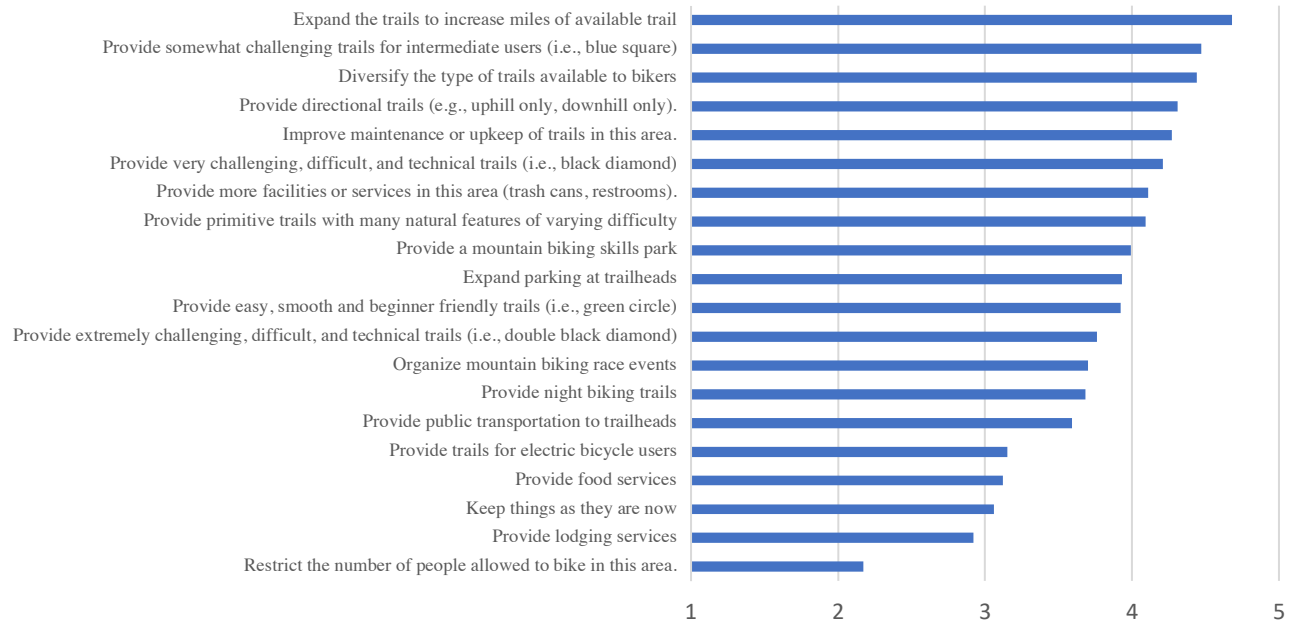
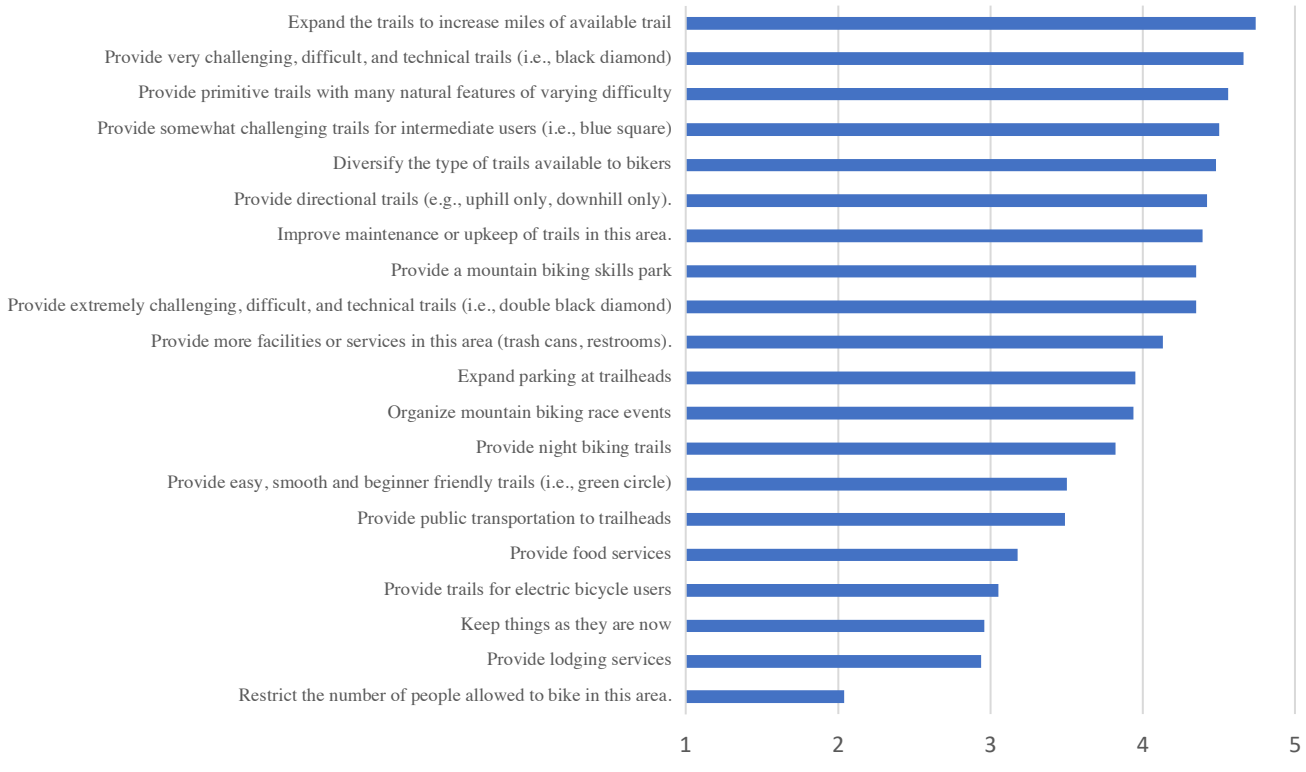


Figure 29: Support for new recreation management actions among the expert bikers
(1=Strongly oppose, 2=Oppose, 3=Neither, 4=Support, 5=Stronly support)



Together, these results reveal substantial key information. First, the most supported recreation management actions outlined above (e.g., expanding trails to increase miles and providing somewhat challenging trails) are most favored by skilled bikers (*e.g., intermediate and expert bikers*) than unskilled bikers (*e.g., beginners and novices*). Therefore, considering both skilled and unskilled markets is important when prioritizing recreation management. The former market represents an area of market growth potential. The latter represents areas at the Whiskey Run trails that most need to improve and maintain the quality of bicycling recreation. Second, considering each management action's effect on increasing bicycling recreation at the Whiskey Run helps determine the management action to prioritize. Therefore, the recommended top ten priority management actions, which are likely to increase bicycling recreation (and enhance the quality of recreation experience) among the unskilled bikers, are shown in Box 1 below (*see Table 3-I in the appendix for details*). For example, providing easy and smooth trails or green circle trails, improving maintenance of trails, and providing directional trails are top priority management actions specific to unskilled bikers. The preference for easy, smooth, and open trails with fewer obstacles among the less-skilled bikers is recognized in the literature (Symmonds & Hammitt, 2000). Although providing a mountain biking skills park is rated relatively low, having a "pump track" (*closed short circuit, ideally made from asphalt, where the rider must "pump" to maintain speed*) nested within a skills park has had good success in attracting novices and experts from both already represented communities, as well as underserved individuals (*e.g., Gateway Green bike park in Portland*). Skill parks close to the parking lot offer individuals a chance to warm up before entering the trails (*reducing the risk of injury*), as well as a place to spend time while waiting for other riders to arrive (*when parties drive separately*).

Box 1: Priority bicycling recreation management actions for unskilled bikers at Whiskey Run trails

1. Provide easy, smooth, and beginner friendly trails (i.e., green circle)
2. Improve maintenance or upkeep of trails in this area.
3. Provide directional trails (e.g., uphill only and downhill only).
4. Provide somewhat challenging trails for intermediate users (i.e., blue square)
5. Expand the trails to increase the miles of available trail
6. Diversify the type of trails available to bikers
7. Provide more facilities or services in this area (trash cans and restrooms).
8. Provide very challenging, difficult, and technical trails (i.e., black diamond)
9. Provide a mountain biking skills park
10. Provide primitive trails with many natural features of varying difficulty

Similarly, the recommended top ten priority recreation management actions likely to increase the level of use and experience of skilled bikers are presented in Box 2. In contrast to unskilled bikers' priority management actions, the top priority recreation management actions targeting skilled bikers include expanding trails to increase miles, providing somewhat challenging trails (blue square), diversifying the trails available, and providing challenging trails (black diamond; *see Table 3-J in Appendix 6.6*). For experienced groups of bikers seeking speed, excitement, and technical challenge, trails diversification should aim to integrate varied specialized rides (e.g., rides such as downhill, cross-country, free-ride, single-speed, endurance, and others; Hagen & Boyes, 2016).

Box 2: Priority bicycling recreation management actions for skilled bikers at the Whiskey Run trails

1. Expand the trails to increase the miles of available trails
2. Provide somewhat challenging trails for intermediate users (i.e., blue square)
3. Diversify the type of trails available to bikers
4. Provide very challenging, difficult, and technical trails (i.e., black diamond)
5. Provide directional trails (e.g., uphill only, downhill only).
6. Improve maintenance or upkeep of trails in this area.
7. Provide primitive trails with many natural features of varying difficulty
8. Provide a mountain biking skills park
9. Provide more facilities or services in this area (trash cans and restrooms).
10. Provide extremely challenging, difficult, and technical trails (i.e., double black diamond)

Therefore, the management of the Whiskey Run trails is encouraged to prioritize investment in the active programming of recreation management actions outlined in Boxes 1 and 2 above in the ranked order suggested for unskilled and skilled bikers, respectively. Considering a) the uniqueness of recreation needs of the unskilled compared to the skilled bikers (Symmonds & Hammitt, 2000), b) the potential for bicycling recreation to exceed recreation-carrying capacity resulting in visitor use conflict that adversely affects the quality of biking recreation (Manning, 1999, 2007), and c) the need for Whiskey Run to maintain the high-quality standards of bicycling recreation, it is recommended that trails for unskilled bikers be separated from those for the skilled. Zoning the location of trails, making trailheads, and parking by skill level will help the management to mitigate issues (e.g., use conflict) associated with exceeding the recreation-carrying capacity of the Whiskey Run trails, thus sustaining the quality and uniqueness of bicycling recreation that the Whiskey Run trails offer (Manning, 1999, 2007).

3.3.4 Potential sources of trail maintenance fees

Results presented in Figure 30 and Table 13 show that mountain bikers support all the three alternative sources of trail maintenance resources, including bikers offering to volunteer to help with trail maintenance (mean = 4.33), donating voluntarily to a trail maintenance fund (mean = 4.21), and supporting endowment funds created for trail maintenance (mean = 4.12). When compared across varied levels of recreation bicycling skills (e.g., beginners, novices, intermediates, and experts), the level of support for donations and endowment funds was relatively similar. In contrast, the level of support for volunteering time to help with trail maintenance was moderately higher among the most-skilled bikers (e.g., experts and intermediate bikers) compared to the less-skilled bikers (i.e., beginner bikers; $F = 4.93$, $p < .01$, effect size (η) = .22). Results also show that beginner bikers are less likely to support all three alternative sources of trail maintenance resources.

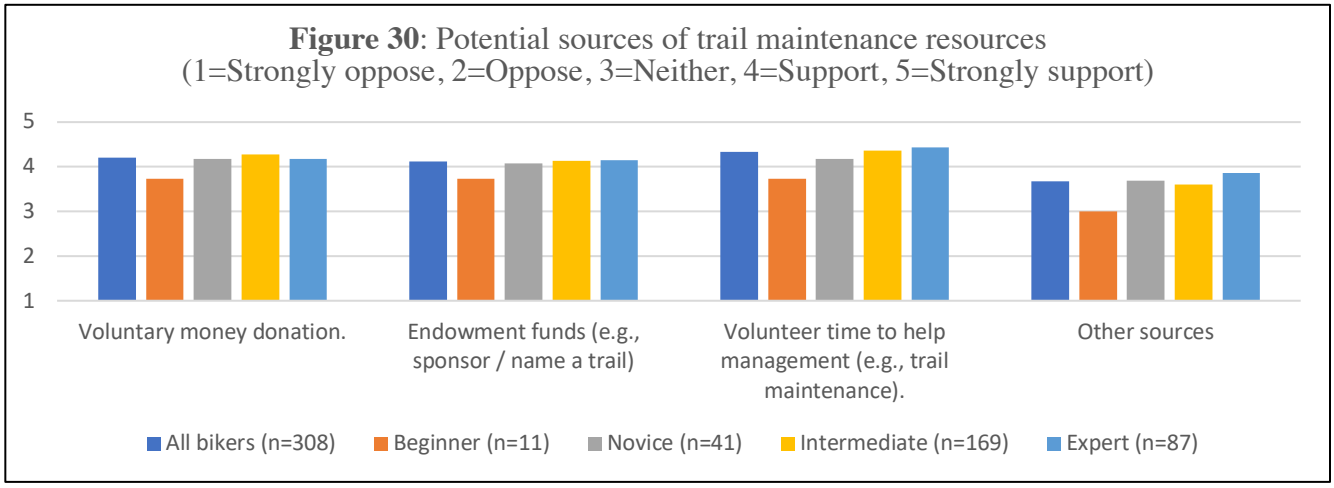


Table 13: Potential sources of trail maintenance resources

Potential sources of trail maintenance resources	Total (n = 308)	Skill level in bicycling for recreation: Beginner (n = 11)	Novice (n = 41)	Intermediate (n = 169)	Expert (n = 87)	F	Sig.	Eta (η)
Voluntary money donation.	4.21	3.73	4.17	4.27	4.17	1.84	0.14	0.13
Endowment funds (e.g., sponsor / name a trail)	4.12	3.73	4.07	4.14	4.15	1.08	0.36	0.10
Volunteer time to help management (e.g., trail maintenance).	4.33	3.73[b]	4.17	4.36[a]	4.43[a]	4.93	<.01	0.22
Other sources	3.68	3.00	3.69	3.60	3.86	0.81	0.49	0.15

Note: Cell entries are means based on a 5-point agreement scale, where 1 = strongly oppose and 5 =strongly support. Tamhane's post-hoc tests show that means for experts and intermediate bikers (with superscript a) are significantly higher than the means for beginner bikers (with superscript b)

Furthermore, respondents were questioned about the amount of money they would donate toward trail maintenance. According to Table 14, most bikers (34.6%) are likely to donate between $11 and $50. The amount bikers are willing to donate did not significantly differ across varying skill levels of bikers ($F = 0.77$, $p > .05$). Considering that about 30% of the respondents are willing to donate more than $50 a year, asking mountain bikers to donate $50 is reasonable. Additionally, respondents were asked about how frequently they are willing to donate, and most (about 83%) preferred annual donations (see Table 15). Similarly, the difference in donation frequency is not statistically significant among beginner, novice, intermediate, and expert bikers ($F = 1.17$, $p > .05$).

Table 14: Maximum amount mountain bikers are willing to donate toward trail maintenance

Donation amount options	Frequency	Percent	Valid Percent	Cumulative Percent
Would not donate	33	8.1	12.5	12.5
Donate between $1 and $10	63	15.4	24	36.5
Donate between $11 and $50	91	22.2	34.6	71.1
Donate between $51 and $100	51	12.5	19.4	90.5
Donate above $100	25	6.1	9.5	100
Total	**263**	**64.3**	**100**	
Missing	146	35.7		
Total	**409**	**100**		

Table 15: Preferred frequency of donating toward trail maintenance

Donation frequency options	Frequency	Percent	Valid Percent	Cumulative Percent
Donate once a year	125	30.6	83.3	83.3
Donate per use	25	6.1	16.7	100
Total	**150**	**36.7**	**100**	
Missing	259	63.3		
Total	**409**	**100**		

4.0 Conclusion

This report summarizes findings from the survey of mountain bikers, aiming to understand and address their recreation needs. Several insights into the perspective of mountain bikers and recreation sites emerged from this survey.

From the mountain bikers' perspective, the Whiskey Run trails clearly attract well-educated, affluent visitors who perceive themselves to be skilled mountain bikers. Most skilled mountain bikers come from the Central and Willamette valley regions of Oregon and out-of-state areas such as Washington state and California. Additionally, most skilled bikers learn about the Whiskey Run trails from word-of-mouth recommendations. Together, these attributes of mountain bikers to the Whiskey Run trails demonstrate the management of the importance of understanding and addressing the high-quality recreation needs of skilled mountain bikers, some of which are outlined in the recreation site attributes of Whiskey Run.

From the recreation site perspective, the report shows that the Whiskey Run trails attract family size groups (three–five people) who spend about four hours biking in trails. Overall, the report shows that both skilled and unskilled bikers at Whiskey Run are happy with their recreation bicycling experience. Particularly, skilled bikers are most happy with their experience, and considering how knowledgeable and sensitive they are to the quality of mountain biking, this finding supports the high-quality recreation experience the Whiskey Run trails offer. To enhance the quality of recreation experiences for bikers at Whiskey Run, essential recreation facilities and services (e.g., installation of directional signage and restroom at trailheads) are suggested in this report. Additionally, this report indicates that quality maintenance should focus on two important market segments of bikers, skilled and unskilled. The latter represents the current market that needs to be maintained, while the former represents a growth opportunity. This report suggests priority recreation management actions to attract and enhance the recreation experiences of the unskilled bikers' (e.g., development of easy and smooth trails) and the skilled bikers' market (e.g., increasing miles of available trails for intermediate and expert bicycling).

However, the suggested efforts to improve the recreation experience carry the risk of the Whiskey Run trails exceeding their recreation-carrying capacity due to brisk growth and the associated

recreation use conflict issues that adversely affect biking at Whiskey Run. This report suggests separating unskilled trails and related facilities (e.g., parking, toilets) from skilled trails as a short-term solution. A long-term solution, however, requires complementing the trail-use zoning by skill level with the regular monitoring of recreation use capacity of trails to ensure that the suggested improvements do not lead to the exceeding of physical capacity (i.e., amount of space available for skilled and unskilled rides on trails), social capacity (i.e., the maximum number of biker encounters one is willing to accept during a ride without compromising the quality of riding experience), and facility capacity (i.e., the maximum number of cars one is willing to accept at a trailhead parking area without compromising the quality of their experience) of the Whiskey Run trails (Manning, 2007).

Setting physical, social, and facility capacity goals or standards of bicycling recreation at Whiskey Run enables management to monitor and detect recreation-carrying capacity risks early before irreversible damage occurs and the quality of recreation is compromised (Manning, 2007). Therefore, it is suggested that a study be conducted soon to determine the biking-carrying capacity of the Whiskey Run trails (i.e., the level of recreational bicycling the trails can withstand while providing a sustainable quality of riding experience (Manning, 1999). This study would also create monitoring indicators and instruments to enable the trails to monitor the recreation use capacity and conflict issues. This is important because the Whiskey Run trails are adjacent to one of the highest quality tourism attractions in the country (Bandon Dunes Golf Resort), which sets the standards of quality of tourism and recreation opportunities offered in Bandon, Oregon. Once the quality monitoring program is established at the Whiskey Run trails, it would be strategic to promote the trails as a sister attraction to the Bandon Dunes Golf Resort.

The findings outlined in this report provide a foundation for the management to start the process of setting a recreation vision linking the Whiskey Run trails to the Bandon Dunes Golf Resort in terms of the quality of recreation experiences offered. Strategic alliances with the Bandon Dunes Golf Resort would also help create strategic recreation management and promotion partnerships (i.e., offering trail use as an added activity for golfers). This recreation vision presents an opportunity to set a high-quality bar of recreation experience for the trails among the many competing mountain biking destinations in Oregon.

5.0 References

Buning, R. J., & Lamont, M. (2021). Mountain bike tourism economic impacts: A critical analysis of academic and practitioner studies. *Tourism Economics*, *27*(3), 500–509.

Ewert, A., & Hollenhorst, S. (1994). Individual and setting attributes of the adventure recreation experience. *Leisure Sciences*, *16*(3), 177–191.

Hagen, S., & Boyes, M. (2016). Affective ride experiences on mountain bike terrain. *Journal of Outdoor Recreation and Tourism*, *15*, 89–98.

Hill, E., & Gómez, E. (2020). Perceived health outcomes of mountain bikers: A national demographic inquiry. *Journal of Park & Recreation Administration*, *38*(2).

Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist*, *46*(8), 819.

Lee, S. H., Graefe, A. R., & Li, C. L. (2007). The effects of specialization and gender on motivations and preferences for site attributes in paddling. *Leisure Sciences*, *29*(4), 355–373.

Mannell, R. C. (1999). Leisure experience and satisfaction. In E. L. Jackson and T. L. Burton (Eds.), *Leisure studies: Prospects for the twenty-first century* (pp. 235–251). Venture.

Manning, R. E. (1999). *Studies in outdoor recreation*. Oregon State University Press.

Manning, R. E. (2007). *Parks and carrying capacity: Commons without tragedy*. Island Press.

Newsome, D., Stender, K., Annear, R., & Smith, A. (2016). Park management response to mountain bike trail demand in South Western Australia. *Journal of Outdoor Recreation and Tourism*, *15*, 26–34.

Pierce, C. L., Manfredo, M. J., & Vaske, J. J. (2001). Social science theories in wildlife management. *Human Dimensions of Wildlife Management in North America*, 39–56.

Runyan, D. (2012). The economic significance of bicycle-related travel in Oregon. Prepared for Travel Oregon.

Symmonds, M. C., & Hammitt, W. E. (2000). Managing recreational trail environments for mountain bike user preferences. *Environmental Management*, *25*(5), 549–564.

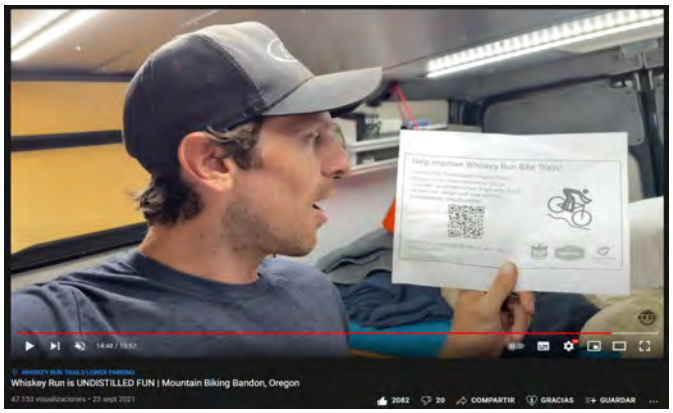
Vaske, J. J. (2008). Survey research and analysis: Applications in parks, recreation, and human dimensions. Venture Publishing Inc.

6.0 Appendices

6.1 Survey Distribution

The survey was distributed onsite at the Whiskey Run trails and through various organizations for online completion. Online survey administration was facilitated by about 29 mountain biking organizations in Oregon, California, Washington, and Idaho. A personal email was written to leaders of the 29 different biking organizations, and these personal contact efforts were followed up with social media (Facebook or Instagram) survey distribution messages. For example, the following organizations were contacted and agreed to facilitate the survey completion: BKXC YouTube Channel, Moe' Bike Shop, Itty Bitty Inn, Front Street Community Bike Works, South Coast Bicycles, Bandon Bicycle Works, Oregon Trails Coalition, Central Oregon Trail Alliance, Hood River Area Trail Stewards, Team Dirt, Wild Rivers Coast Mountain Bicycling Association, and Whatcom Mountain Bike Coalition.

One of the shops that agreed to support the distribution of the survey



Examples of social media distributions

Examples of onsite distributions

6.2 Survey Questionnaire (blank)

Mountain Bikers' Recreation Needs at Whiskey Run, Coos County, Oregon

Please return a completed survey to the researcher OR mail it using the envelope provided. You may also complete this survey online using the QR code provided below.

Participation is Voluntary and Responses are Anonymous

Thank You for Your Participation

A Study Conducted Cooperatively by:

SOUTHERN OREGON COAST

OREGON SOUTH COAST REGIONAL TOURISM NETWORK

Oregon State University

This survey is conducted to learn about mountain bikers' recreation needs at Whiskey Run in Bandon, Oregon. Your input is important and will assist us to improve the quality of mountain biking recreation experience at Whiskey Run. ***Once you have completed this survey, please return it as soon as possible.***

1. Prior to today, had you ever visited the Whiskey Run biking trails? **(Check *ONE*)**

   ☐ No → Please skip to question 5, if your answer is No
   ☐ Yes

2. About how often did you ride on the Whiskey Run biking trails ***in the past 12 months***? **(Check *ONE*)**

   ☐ Less than once a month (less than 12 times per year)
   ☐ About once a month (12 to 18 times per year)
   ☐ About two or three times a month (19 to 45 times per year)
   ☐ About once a week (46 to 80 times per year)
   ☐ About twice a week (81 to 130 times per year)
   ☐ Three or more times a week (over 130 times per year)

3. Typically, how long does a trip to ride on the biking trails at Whiskey Run last?

4. About how many times a **week** do you typically recreate at the Whiskey Run biking trails in the following seasons? **(Write the response in the space provided)**

   Spring (***write response***) _____, Summer (***write response***) _____, Fall (***write response***) _____,Winter (***write response***) _____.

5. If you are a resident of Coos County, about how many **trips** have you made here since the biking trails were created?

   (Write number in the space provided) Day trip(s)_____, Overnight trip(s)_____.

6. If you are traveling from out of Coos County, about how many nights did you stay to recreate here? (***Write response***) _____.

7. How did you learn about the Whiskey Run biking trails? (***Write response***)
   .

8. About how far from your home did you travel to get to the Whiskey Run trails? **(Write the number of miles)**
   _____ mile(s)

9. How many hours did you spend at the Whiskey Run biking trails on this trip? **(Write number)**
   hour(s).

10. How would you describe your skill level in bicycling for recreation? (**Check *ONE***)

    ☐ Beginner ☐ Novice ☐ Intermediate ☐ Expert

11. Are you participating in bicycling today as part of an organized event? (**Check *ONE***) ☐No ☐Yes.

12. ***INCLUDING YOURSELF***, how many people are in your riding group at the Whiskey Run biking trails ***today***?
    persons(s)

13. How did you get to the Whiskey Run biking trails ***today***? **(Check *ONE*)**

    ☐ Own car/truck ☐ Bicycle ☐ Motorcycle ☐ Camper/recreational vehicle
    ☐ Rental car ☐ Tour bus ☐ Taxi/Rideshare

14. Which of the following best describes the purpose of your trip? **(Check *ONE*)**

☐ Primarily for biking recreation here – biking at Whiskey Run was the main purpose of my visit here
☐ Primarily for biking recreation elsewhere – my main biking recreation destination was NOT Whiskey Run
☐ Primarily for business – biking at Whiskey Run was a side activity
☐ Primarily for visiting family or friends – biking at Whiskey Run was a side activity
☐ Some other reason (**Write response**) _____.

15. If you had NOT been able to go to the Whiskey Run biking trails during this visit, what would you have done? **(Check *ONE*)**

☐ Gone somewhere else for the same activity → how far from home is the place you would go instead? _____miles(s)
☐ Gone somewhere else for a different activity → how far from home is the place you would go instead? _____miles(s)
☐ Come back another time
☐ Stayed home
☐ Gone to work at my regular job
☐ Something else (none of the above)

16. If you are traveling from out of Coos County, please indicate where you stayed while recreating here.

(***Write response***) _____.

17. Are you traveling with a paid guide? (***Check ONE***) ☐ No ☐ Yes

18. How ***important*** is it to you that **each** of the following facilities is present at the Whiskey Run biking trails? **(Circle *ONE* number for *EACH*)**

	Not Important		Neither		Very Important
Pit toilets	1	2	3	4	5
Showers	1	2	3	4	5
Rinse stations	1	2	3	4	5
Trash cans	1	2	3	4	5
Picnic tables	1	2	3	4	5
Picnic tables with shade/rain protection	1	2	3	4	5
Information signs about guidelines	1	2	3	4	5
Bike racks with electric charging stations	1	2	3	4	5
Bike racks without electric charging stations	1	2	3	4	5
Bike repair tools	1	2	3	4	5
Bike rental and repair service	1	2	3	4	5
Food service	1	2	3	4	5
Shuttle service	1	2	3	4	5
Lodging service	1	2	3	4	5
Camping service	1	2	3	4	5
Directional signs within the biking trails	1	2	3	4	5
Directional signs to biking trails	1	2	3	4	5
Parking for vehicles at trailheads	1	2	3	4	5

19. The facilities below are available at the Whiskey Run biking trails. Considering **ONLY** the facilities you saw during your visit here, how **dissatisfied** or **satisfied** were you with the following? (**Circle *ONE* number for *EACH facility you saw here***)

	Very Dissatisfied		Neither		Very Satisfied	Facility Not Available
Pit toilets	1	2	3	4	5	N/A
Directional signs within the biking trails	1	2	3	4	5	N/A
Directional signs to biking trails	1	2	3	4	5	N/A
Parking for vehicles at trailheads	1	2	3	4	5	N/A

20. Lodging and food services at the Whiskey Run biking trails are currently not available. To what extent do you **oppose** or **support** each of the following possible alternatives located near the trail entrances (e.g., within a distance of about 3 miles)? **(Circle *ONE* number for *EACH* alternative)**

	Strongly Oppose	Oppose	Neither	Support	Strongly Support
Information kiosk	1	2	3	4	5
Lodge/motel	1	2	3	4	5
Recreational vehicle park/camping area	1	2	3	4	5
Log cabins	1	2	3	4	5
Food service	1	2	3	4	5
Restrooms at trailheads	1	2	3	4	5
Tent campground with bathrooms at trailheads	1	2	3	4	5
Other (**please specify**……)	1	2	3	4	5

21. If the management installed the following facilities and services, would that affect how often you engage in mountain biking recreation at Whiskey Run? (**For each action, circle the number indicating whether it would lead to a decrease in your mountain biking recreation activity, would have no effect, would lead to a small increase in your mountain biking recreation activity, or would lead to a large increase in mountain biking recreation.**)

	Lead to decrease	No effect	Lead to small increase	Lead to large increase
Information kiosk	1	2	3	4
Lodge/motel	1	2	3	4
Recreational vehicle park/camping area	1	2	3	4
Log cabins	1	2	3	4
Food service	1	2	3	4
Restrooms at trailheads	1	2	3	4
Tent campground with bathrooms at trailheads	1	2	3	4
Other (**please specify**……)	1	2	3	4

22. Access to the Whiskey Run biking trails is currently free. To what extent do you **oppose** or **support** each of the following possible alternatives to help cover costs? Understanding alternative ways of meeting trail maintenance cost is valuable to recreation management **(Circle *ONE* number for *EACH* alternative)**

The Whiskey Run biking trail system should be maintained using resources from…	Strongly Oppose	Oppose	Neither	Support	Strongly Support
…voluntary money donation.	1	2	3	4	5
…endowment (e.g., sponsor / name a trail).	1	2	3	4	5
…volunteer time to help management (e.g., trail maintenance).	1	2	3	4	5
…other (**please specify**……)	1	2	3	4	5

23. What is the ***maximum*** amount you would be willing to donate toward the maintenance of the biking trails at Whiskey Run? (**Write amount; put "0" if you would not donate)** $_____.

24. About how many times a year would you be willing to make the above donation? (***Write response***) .

25. About how much money in total do you spend on mountain biking trips each year (e.g., travel, food, equipment, biking clubs, etc.)? (***Write number)*** _____.

26. About how much money in total do you spend on mountain biking equipment each year (e.g., mountain bikes, attire, etc.)? (***Write number)***_____.

27. Overall, how satisfied are you with your experience at the Whiskey Run biking trails? **(Circle *ONE* number for *EACH*)**

Overall, …	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
…the bicycling experience here was satisfying to	1	2	3	4	5
…the general recreation experience here was	1	2	3	4	5
…the natural environment I experienced here was	1	2	3	4	5
…the facilities available here (e.g., parking) were	1	2	3	4	5
…I am happy with the experience I had here	1	2	3	4	5
…the experience I had here was as good as I	1	2	3	4	5
…I felt comfortable with the experience I had here	1	2	3	4	5

28. Coos County helps people engage in mountain biking recreation at Whiskey Run by providing trails and other facilities. If the county undertook the following actions, to what extent would you **oppose** or **support** each of the following possible management actions at the Whiskey Run biking trails? (**Circle *ONE* number for *EACH* possible management action**)

Management action	Strongly Oppose	Oppose	Neither	Support	Strongly Support
Provide directional trails (e.g., uphill only, downhill only).	1	2	3	4	5
Restrict the number of people allowed to bike in this area.	1	2	3	4	5
Improve maintenance or upkeep of trails in this area.	1	2	3	4	5
Provide more facilities or services in this area (trash cans and restrooms).	1	2	3	4	5
Provide easy, smooth, and beginner-friendly trails (i.e., green circle)	1	2	3	4	5
Provide somewhat challenging trails for intermediate users (i.e., blue square)	1	2	3	4	5
Provide very challenging, difficult, and technical trails (i.e., black diamond)	1	2	3	4	5
Provide extremely challenging, difficult, and technical trails (i.e., double black diamond)	1	2	3	4	5
Provide primitive trails with many natural features of varying difficulty	1	2	3	4	5
Provide a mountain biking skills park	1	2	3	4	5
Organize mountain biking race events	1	2	3	4	5
Provide night biking trails	1	2	3	4	5
Provide trails for electric bicycle users	1	2	3	4	5
Expand the trails to increase miles of available trail	1	2	3	4	5
Diversify the type of trails available to bikers	1	2	3	4	5
Provide public transportation to trailheads	1	2	3	4	5
Provide food services	1	2	3	4	5
Provide lodging services	1	2	3	4	5
Expand parking at trailheads	1	2	3	4	5
Keep things as they are now	1	2	3	4	5

29. Coos County helps people engage in mountain biking recreation at Whiskey Run by providing trails and other facilities. If the county undertook the following management actions, would that affect how often you engage in mountain biking recreation at Whiskey Run? (**For *EACH* action, circle *ONE* number indicating whether your mountain biking activity would decrease, have no effect, would lead to a small increase, or would lead to a large increase.**)

Management action	Lead to a decrease	No effect	Lead to a small increase	Lead to a large increase
Provide directional trails (e.g., uphill only, downhill only).	1	2	3	4
Restrict the number of people allowed to bike in this area.	1	2	3	4
Improve maintenance or upkeep of trails in this area.	1	2	3	4
Provide more facilities or services in this area (trash cans, restrooms, and picnic tables).	1	2	3	4
Provide easy, smooth, and beginner-friendly trails (known as "green circle")	1	2	3	4
Provide somewhat challenging trails for intermediate users (known as "blue square")	1	2	3	4
Provide very difficult and technical trails (known as "black diamond")	1	2	3	4
Provide extremely difficult and technical trails (known as "double black diamond")	1	2	3	4
Provide primitive trails with many natural features of varying difficulty	1	2	3	4
Provide a mountain biking skills park	1	2	3	4
Organize mountain biking race events	1	2	3	4
Provide night biking trails	1	2	3	4
Provide trails for electric bicycle users	1	2	3	4
Expand the trails to increase miles	1	2	3	4
Diversify the type of trails available to bikers	1	2	3	4
Provide public transportation to trailheads	1	2	3	4
Provide food services	1	2	3	4
Provide lodging services	1	2	3	4
Expand parking at trailheads	1	2	3	4
Keep things as they are now	1	2	3	4

30. How important to you is bicycling in nature trails such as the Whiskey Run biking trails? (**Circle *ONE* number for *EACH* item**)

I believe that bicycling on nature trails similar to trails at Whiskey Run is…

…unimportant	1	2	3	4	5	6	7	…important
…irrelevant	1	2	3	4	5	6	7	…relevant
…means nothing to me	1	2	3	4	5	6	7	…means a lot to me
…does not matter to me	1	2	3	4	5	6	7	…matters to me
…of no concern to me	1	2	3	4	5	6	7	…of concern to me

31. To what extent was your overall experience at the Whiskey Run biking trail consistent or inconsistent with what you wanted to achieve during this visit? **(Circle *ONE* number)**

Very much inconsistent 1 2 3 4 5 6 7 Very much consistent

32. In comparison to what you desired, how consistent or inconsistent was the overall experience with the Whiskey Run biking trails? **(Circle *ONE* number)**

Very much inconsistent 1 2 3 4 5 6 7 Very much consistent

33. To what extent do you find your overall experience with the Whiskey Run biking trails to be important or not important in achieving your recreation goals/needs/desires? **(Circle *ONE* number)**

Not at all important 1 2 3 4 5 6 7 Extremely important

34. To what extent has the overall experience at the Whiskey Run biking trail contributed or not contributed to achieving your personal goals in life? **(Circle *ONE* number)**

Not at all 1 2 3 4 5 6 7 Very much

35. How was your bicycling experience at the Whiskey Run biking trails? (**Circle *ONE* number for *EACH* item**)

My bicycling experience here was…								
…boring	1	2	3	4	5	6	7	…interesting
…not fun	1	2	3	4	5	6	7	…fun
…unappealing	1	2	3	4	5	6	7	…appealing
…dull	1	2	3	4	5	6	7	…stimulating
…unexciting	1	2	3	4	5	6	7	…exciting

36. How expected or unexpected was your overall experience at the Whiskey Run biking trails? **(circle *ONE* number)**

Unexpected 1 2 3 4 5 6 7 Expected

37. How usual or unusual was your overall experience at the Whiskey Run biking trails? **(circle *ONE* number)**

Unusual 1 2 3 4 5 6 7 Usual

38. To what extent was the overall experience you had with the Whiskey Run biking trails unfamiliar or familiar based on your previous experience of biking in nature? **(circle *ONE* number)**

Unfamiliar 1 2 3 4 5 6 7 Familiar

39. During your visit to the Whiskey Run biking trails, how frequently did you feel each of the following emotions? (**Circle *ONE* number for *EACH* item**)

Overall, I felt…	Never	Hardly Ever	Sometimes	Quite Often	Always
…angry	1	2	3	4	5
…furious	1	2	3	4	5
…irritated	1	2	3	4	5
…annoyed	1	2	3	4	5

40. During your visit to the Whiskey Run biking trails, how frequently did you feel each of the following emotions? (**Circle *ONE* number for *EACH* item**)

Overall, I felt…	Never	Hardly	Sometimes	Quite	Always
…excited	1	2	3	4	5
…elated	1	2	3	4	5
…enthusiastic	1	2	3	4	5
…delighted	1	2	3	4	5
…gleeful	1	2	3	4	5

41. To what extent do you ***disagree or agree*** with the following statements about your intentions to revisit the Whiskey Run biking trails? **(Circle *ONE* number for *EACH*)**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I will revisit the Whiskey Run biking trails in the future	1	2	3	4	5
I am likely to schedule multiple visits to the Whiskey Run biking trails	1	2	3	4	5
I will NOT schedule my next visit to the Whiskey Run biking trails	1	2	3	4	5
The Whiskey Run biking trails would be my first choice if I wanted to do mountain biking	1	2	3	4	5
If asked to, I would register as a member of the Whiskey Run biking association	1	2	3	4	5

42. To what extent do you ***disagree or agree*** with the following statements about your intentions to switch mountain biking recreation from the Whiskey Run biking trails to another mountain biking destination? **(Circle *ONE* number for *EACH*)**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I will not recommend the Whiskey Run biking trails to my friends and family	1	2	3	4	5
I will not visit the Whiskey Run biking trails anymore	1	2	3	4	5
I will switch to another mountain biking trail destination other than the Whiskey Run biking trails because of the poor experience I had here	1	2	3	4	5

43. To what extent do you ***disagree or agree*** with the following statements about your intentions to recommend the Whiskey Run biking trails to others? (***Circle ONE number for EACH***)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I would recommend bicycling at the Whiskey Run biking trails to someone else	1	2	3	4	5
I am likely to talk to others about how happy the bicycling experience at the Whiskey Run biking trails was	1	2	3	4	5
I would mention the Whiskey Run biking trails if someone else wanted a bicycling recreation experience	1	2	3	4	5

44. Please indicate whether bicycling at the Whiskey Run biking trails would **decrease**, **have no effect on**, or i**ncrease** your wellbeing for each aspect? (**Circle *ONE* number for *EACH* item**)

	Decrease a lot	Decrease a little	No effect	Increase a little	Increase a lot
Your life overall, considering all aspects	1	2	3	4	5
Your financial situation	1	2	3	4	5
Your social life, beyond family	1	2	3	4	5
Your pride in the mountain biking community and	1	2	3	4	5
Your recreation opportunities	1	2	3	4	5
Your perceived quality of the natural environment	1	2	3	4	5

45. Which of the following do you identify as: **(Check *ONE*)** ☐ Male ☐ Female ☐ Non-binary

46. How old are you? (**Write response**) _____years old

47. Which of the following do you identify as? **(Check *ONE*)**

☐ White (Caucasian) ☐ Hispanic or Latino ☐ Native American or Alaskan native

☐ Black or African American ☐ Asian ☐ Native Hawaiian or Pacific Islander

☐ A race or ethnicity not listed here; please specify in the space provided _____.

48. What is the **highest** level of education that **you** have completed? **(Check *ONE*)**

☐ Less than high school diploma

☐ 9th to 12th grade, but no diploma received

☐ High school diploma or GED

☐ Some college, but no degree received

☐ Associates degree or 2-year technical school

☐ 4-year college degree (for example, bachelor's degree)

☐ Graduate degree beyond 4-year college degree (for example, master's, Ph.D., medical doctor, law degree)

49. Where is your ***primary*** residence? City//town_____, County _____, State _____, Country , _____ZIP Code_____.

50. Which of these broad categories best describes your ***current annual household income before taxes***? **(Check *ONE*)**

☐ Under $25,000

☐ $25,000 to $49,999

☐ $50,000 to $74,999

☐ $75,000 to $99,999

☐ $100,000 to $149,999

☐ $150,000 to $199,999

☐ $200,000 to $249,999

☐ $250,000 or more

Thank you for completing this questionnaire! If you have any other comments, please write them here:

_____

_____

Thank you, your input is important!
Please return a completed survey to the researcher OR mail it using the envelope provided.

RESEARCHER COMPLETES THIS SECTION:Date: _____ Time: _____ Site/Online/Mail (**select one**): _____ Questionnaire ID#:_____.

6.3 Survey Questionnaire with Un-Collapsed Percentages

1. Prior to today, had you ever visited the Whiskey Run biking trails?/Have you ever visited the Whiskey Run biking trails **(Check *ONE*)**

   37% No → Please skip to question 5, if your answer is No
   63% Yes

2. About how often did you ride on the Whiskey Run biking trails ***in the past 12 months***? **(Check *ONE*)**

   62% Less than once a month (less than 12 times per year)
   8% About once a month (12 to 18 times per year)
   8% About two or three times a month (19 to 45 times per year)
   8% About once a week (46 to 80 times per year)
   7% About twice a week (81 to 130 times per year)
   6% Three or more times a week (over 130 times per year)

3. Typically, how long does a trip to ride on the biking trails at Whiskey Run last? **3.03 hours**

4. About how many times a **week** do you typically recreate at the Whiskey Run biking trails in the following seasons? **(Write the response in the space provided)**

   Spring (***write response***) **1.34** , Summer (***write response***) **1.94** , Fall (***write response***) **1.58** ,Winter (***write response***) **0.81**

5. If you are a resident of Coos County, about how many **trips** have you made here since the biking trails were created?

   (Write the number in the space provided) Day trip(s)**92.63**, Overnight trip(s)**1.24**
   .

6. If you are traveling from out of Coos County, about how many nights did you stay to recreate here? (***Write response***) **3.01** .

7. How did you learn about the Whiskey Run biking trails? (***Write response***)
   .

8. About how far from your home did you travel to get to the Whiskey Run trails? **(Write the number of miles)** **184.48** mile(s)

9. How many hours did you spend at the Whiskey Run biking trails on this trip? **(Write number)** **4.04** hour(s).

10. How would you describe your skill level in bicycling for recreation? (**Check *ONE***)

    4% Beginner 14% Novice 54% Intermediate 28% Expert

11. Are you participating in bicycling today as part of an organized event? / Was your last mountain bike ride at the Whiskey Run trails part of an organized event (**Check *ONE***) 96% No 4% Yes.

12. ***INCLUDING YOURSELF***, how many people are in your riding group at the Whiskey Run biking trails ***today***? **2.82** persons(s)

13. How did you get to the Whiskey Run biking trails ***today***? **(Check *ONE*)**

89% Own car/truck 1% Bicycle ☐ Motorcycle 10% Camper/recreation vehicle
☐ Rental car ☐ Tour bus ☐ Taxi/Rideshare

14. Which of the following best describes the purpose of your trip? **(Check *ONE*)**

77% Primarily for biking recreation here – biking at Whiskey Run was the main purpose of my visit here
4% Primarily for biking recreation elsewhere – my main biking recreation destination was NOT Whiskey Run
3% Primarily for business – biking at Whiskey Run was a side activity
11% Primarily for visiting family or friends – biking at Whiskey Run was a side activity
6% Some other reason (**Write response**) _____.

15. If you had NOT been able to go to the Whiskey Run biking trails for this visit, what would you have done? **(Check *ONE*)**

45% Gone somewhere else for the same activity → how far from home is the place you would go instead? _____miles(s)
23% Gone somewhere else for a different activity → how far from home is the place you would go instead? _____miles(s)
11% Come back another time
10% Stayed home
1% Gone to work at my regular job
10% Something else (none of the above)

16. If you are traveling from out of Coos County, please indicate where you stayed while recreating here?

(***Write response***) _____.

17. Are you traveling with a paid guide? (***Check ONE***) 99% No 1% Yes

18. How ***important*** is it to you that **each** of the following facilities is present at the Whiskey Run biking trails? **(Circle *ONE* number for *EACH*)**

	Not Important	2	Neither	4	Very Important
Pit toilets	6%	4%	14%	36%	41
Showers	66	8	18	7	1
Rinse stations	38	15	21	20	6
Trash cans	6	3	9	32	50
Picnic tables	14	22	33	34	9
Picnic tables with shade/rain protection	23	12	30	27	8
Information signs about guidelines	3	4	12	38	43
Bike racks with electric charging station	72	8	10	6	4
Bike racks without electric charging station	50	10	20	10	9
Bike repair tools	29	12	28	23	7
Bike rental and repair service	49	12	22	11	6
Food service	48	11	19	16	6
Shuttle service	48	8	21	19	4
Lodging service	47	9	25	15	4
Camping service	20	5	18	32	26
Directional signs within the biking trails	2	0	5	28	65
Directional signs to biking trails	5	2	8	34	52
Parking for vehicles at trailheads	0	0	2	19	79

19. Facilities below are available at the Whiskey Run biking trails, considering **ONLY** the facilities you saw during your visit here, how **dissatisfied** or **satisfied** were you with the following? (**Circle *ONE* number for *EACH facility you saw here***)

	Very Dissatisfied	2	Neither	4	Very Satisfied	Facility Not Available
Pit toilets	1%	2%	19%	21%	49%	8%
Directional signs within the biking trails	1	8	15	41	34	1
Directional signs to biking trails	1	8	22	31	37	1
Parking for vehicles at trailheads	0	4	7	34	55	0

20. Lodging and food services at the Whiskey Run biking trails are currently not available, to what extent do you **oppose** or **support** each of the following possible alternatives located near the trail entrances (e.g., within a distance of about 3 miles)? **(Circle *ONE* number for *EACH* alternative)**

	Strongly Oppose	Oppose	Neither	Support	Strongly Support
Information kiosk	1%	2%	23%	47%	27%
Lodge/motel	16	17	42	22	4
Recreational vehicle park/camping area	6	6	18	36	34
Log cabins	13	12	41	27	7
Food service	11	11	37	33	8
Restrooms at trailheads	0	1	6	42	52
Tent campground with bathrooms at trailheads	6	7	23	36	28
Other (**please specify**……)	1	2	3	4	5

21. If the management installed the following facilities and services, would that affect how often you engage in mountain biking recreation at Whiskey Run? (**For each action, circle the number indicating whether it would lead to a decrease in your mountain biking recreation activity, would have no effect, would lead to a small increase in your mountain biking recreation activity, or would lead to a large increase in mountain biking recreation.**)

	Lead to decrease	No effect	Lead to small increase	Lead to large increase
Information kiosk	1%	65%	28%	6%
Lodge/motel	21	56	16	7
Recreational vehicle park/camping area	9	37	29	25
Log cabins	17	54	23	6
Food service	9	51	32	8
Restrooms at trailheads	2	38	36	24
Tent campground with bathrooms at trailheads	10	33	32	25
Other (**please specify**……)	1	2	3	4

22. Access to the Whiskey Run biking trails is currently free. To what extent do you **oppose** or **support** each of the following possible alternatives to help cover costs? Understanding alternative ways of meeting trail maintenance cost is valuable to recreation management **(Circle *ONE* number for *EACH* alternative)**

The Whiskey Run biking trail system should be maintained using resources from…	Strongly Oppose	Oppose	Neither	Support	Strongly Support
…voluntary money donation.	1%	2%	9%	50%	38%
…endowment (e.g., sponsor / name a trail).	1	2	11	55	31
…volunteer time to help management (e.g., trail maintenance).	0	1	8	49	42
…other (**please specify**……)	1	2	3	4	5

23. What is the ***maximum*** amount you would be willing to donate toward the maintenance of biking trails at the Whiskey Run trail? (**Write amount; put "0" if you would not donate)** $**73.06**.

24. About how many times a year would you be willing to make the above donation? (***Write response***) **1.71**.

25. About how much money in total do you spend on mountain biking trips each year (e.g., travel, food, equipment, biking clubs, etc.)? (***Write number)*** **$1805.04**.

26. About how much money in total do you spend on mountain biking equipment each year (e.g., mountain bikes, attire, etc.)? (***Write number)*** **$2032.17**.

27. Overall, how satisfied are you with your experience at the Whiskey Run biking trails? **(Circle *ONE* number for *EACH*)**

Overall, …	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
…the bicycling experience here was satisfying to me	0%	0%	1%	29%	70%
…the general recreation experience here was satisfying to me	0	0	2	39	59
…the natural environment I experienced here was satisfying to me	0	1	3	38	58
…the facilities available here (e.g., parking) were satisfying to me	0	1	11	50	38
…I am happy with the experience I had here	1	0	1	32	66
…the experience I had here was as good as I expected	1	1	4	39	55
…I felt comfortable with the experience I had here	0	0	1	40	59

28. Coos County helps people engage in mountain biking recreation at Whiskey Run by providing trails and other facilities. If the County undertook the following actions, to what extent would you **oppose** or **support** each of the following possible management actions at the Whiskey Run biking trails? (**Circle *ONE* number for *EACH* possible management action**)

Management action	Strongly Oppose	Oppose	Neither	Support	Strongly Support
Provide directional trails (e.g., uphill only, downhill only).	0%	1%	8%	46%	44%
Restrict the number of people allowed to bike in this area.	23	40	30	6	0
Improve maintenance or upkeep of trails in this area.	0	0	11	45	44
Provide more facilities or services in this area (trash cans and restrooms).	1	1	16	51	31
Provide easy, smooth, and beginner-friendly trails (i.e., green circle)	2	4	27	43	24
Provide somewhat challenging trails for intermediate users (i.e., blue square)	0	0	5	46	49
Provide very challenging, difficult, and technical trails (i.e., black diamond)	1	2	13	37	47
Provide extremely challenging, difficult, and technical trails (i.e., double black diamond)	1	4	31	32	32
Provide primitive trails with many natural features of varying difficulty	1	2	17	38	42
Provide a mountain biking skills park	1	4	23	30	42
Organize mountain biking race events	2	4	36	33	25
Provide night biking trails	2	5	39	31	23
Provide trails for electric bicycle users	16	13	34	22	15
Expand the trails to increase miles of available trail	1	1	3	25	70
Diversify the type of trails available to bikers	0	1	9	38	52
Provide public transportation to trailheads	3	4	44	32	17
Provide food services	7	14	44	27	8
Provide lodging services	11	18	43	22	5
Expand parking at trailheads	1	2	23	53	21
Keep things as they are now	4	14	61	18	4

29. Coos County helps people engage in mountain biking recreation at Whiskey Run by providing trails and other facilities. If the County undertook the following management actions, would that affect how often you engage in mountain biking recreation at Whiskey Run? (**For *EACH* action, circle *ONE* number indicating whether your mountain biking activity would decrease, have no effect, would lead to a small increase, or would lead to a large increase.**)

Management action	Lead to a decrease	No effect	Lead to a small increase	Lead to a large increase
Provide directional trails (e.g., uphill only, downhill only).	2%	46%	39%	13%
Restrict the number of people allowed to bike in this area.	47	42	9	2
Improve maintenance or upkeep of trails in this area.	0	24	56	20
Provide more facilities or services in this area (trash cans, restrooms, picnic tables).	1	42	41	16
Provide easy, smooth, and beginner-friendly trails (known as "green circle")	3	56	28	13
Provide somewhat challenging trails for intermediate users (known as "blue square")	0	26	49	25
Provide very difficult and technical trails (known as "black diamond")	2	31	40	27
Provide extremely difficult and technical trails (known as "double black diamond")	5	50	25	20
Provide primitive trails with many natural features of varying difficulty	1	31	40	28
Provide a mountain biking skills park	2	38	39	21
Organize mountain biking race events	10	46	28	16
Provide night biking trails	3	57	30	10
Provide trails for electric bicycle users	18	56	14	11
Expand the trails to increase miles	0	10	40	49
Diversify the type of trails available to bikers	0	17	47	36
Provide public transportation to trailheads	6	63	22	9
Provide food services	7	59	29	5
Provide lodging services	16	51	22	11
Expand parking at trailheads	2	50	34	14
Keep things as they are now	4	85	8	3

30. How important to you is bicycling in nature trails such as the Whiskey Run biking trails? (**Circle *ONE* number for *EACH* item**)

I believe bicycling on nature trails similar to trails at Whiskey Run is… (scale from 1 to 7)								
…unimportant	1%	0%	2%	3%	9%	20%	65%	…important
…irrelevant	0	1	1	8	9	23	58	…relevant
…means nothing to me	2	0	1	6	11	20	62	…means a lot to me
…does not matter to me	2	1	2	5	9	19	62	…matters to me
…of no concern to me	2	2	2	7	13	21	53	…of concern to me

31. To what extent was your overall experience at the Whiskey Run biking trail consistent or inconsistent with what you wanted to achieve during this visit? **(Circle *ONE* number)**

Very much inconsistent 0% 1 1% 2 0% 3 5% 4 16% 5 31% 6 49% 7 Very much consistent

32. In comparison to what you desired, how consistent or inconsistent was the overall experience with the Whiskey Run biking trails? **(Circle *ONE* number)**

Very much inconsistent 0% 1 1% 2 2% 3 6% 4 20% 5 29% 6 44% 7 Very much consistent

33. To what extent do you find your overall experience with the Whiskey Run biking trails to be important or not important in achieving your recreation goals/needs/desires? **(Circle *ONE* number)**

Not at all important 0% 1 0% 2 1% 3 6% 4 21% 5 25% 6 47% 7 Extremely important

34. To what extent has the overall experience at the Whiskey Run biking trail contributed or not contributed to achieving your personal goals in life? **(Circle *ONE* number)**

Not at all 5% 1 2% 2 6% 3 15% 4 23% 5 18% 6 31% 7 Very much

35. How was your bicycling experience at the Whiskey Run biking trails? (**Circle *ONE* number for *EACH* item**)

My bicycling experience here was… (scale from 1 to 7)								
…boring	1%	0%	1%	3%	16%	29%	50%	…interesting
…not fun	0	1	0	2	10	24	64	…fun
…unappealing	1	0	1	2	13	24	59	…appealing
…dull	1	0	1	2	13	25	58	…stimulating
…unexciting	1	1	1	5	13	25	55	…exciting

36. How expected or unexpected was your overall experience at the Whiskey Run biking trails? **(circle *ONE* number)**

Unexpected 1% 1 4% 2 7% 3 12% 4 19% 5 24% 6 33% 7 Expected

37. How usual or unusual was your overall experience at the Whiskey Run biking trails? **(circle *ONE* number)**

Unusual 0% 1 4% 2 11% 3 21% 4 19% 5 23% 6 22% 7 Usual

38. To what extent was the overall experience you had with the Whiskey Run biking trails unfamiliar or familiar based on your previous experience of biking in nature? **(circle *ONE* number)**

Unfamiliar 1% 1 2% 2 5% 3 12% 4 26% 5 29% 6 26% 7 Familiar

39. During your visit to the Whiskey Run biking trails, how frequently did you feel each of the following emotions? (**Circle *ONE* number for *EACH* item**)

Overall, I felt…	Never	Hardly Ever	Sometimes	Quite Often	Always
…angry	89%	10%	1%	0	0
…furious	95	5	0	0	0
…irritated	78	17	5	0	0
…annoyed	68	21	20	1	0

40. During your visit to the Whiskey Run biking trails, how frequently did you feel each of the following emotions? (**Circle *ONE* number for *EACH* item**)

Overall, I felt…	Never	Hardly	Sometimes	Quite	Always
…excited	0%	1%	18%	58%	23%
…elated	2	4	31	44	19
…enthusiastic	0	1	12	47	40
…delighted	0	1	16	47	36
…gleeful	2	2	23	46	28

41. To what extent do you ***disagree or agree*** with the following statements about your intentions to revisit the Whiskey Run biking trails? **(Circle *ONE* number for *EACH*)**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I will revisit the Whiskey Run biking trails in the future	1%	0%	0%	20%	79%
I am likely to schedule multiple visits to the Whiskey Run biking trails	2	2	9	27	60
I will NOT schedule my next visit to the Whiskey Run biking trails	76	18	6	1	0
The Whiskey Run biking trails would be my first choice if I wanted to do mountain biking	6	16	34	20	24
If asked to, I would register as a member of the Whiskey Run biking association	7	10	22	34	26

42. To what extent do you ***disagree or agree*** with the following statements about your intentions to switch mountain biking recreation from the Whiskey Run biking trails to another mountain biking destination? **(Circle *ONE* number for *EACH*)**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I will not recommend the Whiskey Run biking trails to my friends and family	76%	13%	3%	2%	6%
I will not visit the Whiskey Run biking trails anymore	86	12	2	0	0
I will switch to another mountain biking trails destination other than Whiskey Run biking trails because of the poor experience I had here	86	12	1	1	1

43. To what extent do you ***disagree or agree*** with the following statements about your intentions to recommend the Whiskey Run biking trails to others? (***Circle ONE number for EACH***)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I would recommend bicycling at the Whiskey Run biking trails to someone else	2%	0%	2%	23%	73%
I am likely to talk about how happy the bicycling experience at the Whiskey Run biking trails was to others	2	0	4	24	69
I would mention the Whiskey Run biking trails if someone else wanted a bicycling recreation experience	2	0	2	22	74

44. Please indicate whether bicycling at the Whiskey Run biking trails would **decrease**, **have no effect on**, or i**ncrease** your wellbeing for each aspect? (**Circle *ONE* number for *EACH* item**)

	Decrease a lot	Decrease a little	No effect	Increase a little	Increase a lot
Your life overall, considering all aspects	1%	0%	18%	45%	36%
Your financial situation	2	12	78	6	3
Your social life, beyond family	2	1	39	45	14
Your pride in the mountain biking community and its	1	0	12	50	37
Your recreation opportunities	1	0	7	48	44
Your perceived quality of the natural environment of Bandon, Oregon	1	1	11	37	50

45. Which of the following do you identify as: **(Check *ONE*)** 74% Male 25% Female 0% Non-binary

46. How old are you? (**Write response**) **45.65** years old

47. Which of the following do you identify as? **(Check *ONE*)**

86% White (Caucasian) 6% Hispanic or Latino 2% Native American or Alaskan native

0% Black or African American 0% Asian 2% Native Hawaiian or Pacific Islander

4% A race or ethnicity not listed here; please specify in space provided _____.

48. What is the **highest** level of education that **you** have completed? **(Check *ONE*)**

0% Less than high school diploma

0% 9th to 12th grade, but no diploma received

4% High school diploma or GED

15% Some college, but no degree received

10% Associates degree or 2-year technical school

36% 4-year college degree (for example, bachelor's degree)

33% Graduate degree beyond 4-year college degree (for example, master's, Ph.D., medical doctor, law degree)

49. Where is your ***primary*** residence? City//town_____, County _____, State _____, Country , _____ZIP Code_____.

50. Which of these broad categories best describes your ***current annual household income before taxes***? **(Check *ONE*)**

3% Under $25,000

10% $25,000 to $49,999

18% $50,000 to $74,999

16% $75,000 to $99,999

23% $100,000 to $149,999

17% $150,000 to $199,999

6% $200,000 to $249,999

8% $250,000 or more

Thank you for completing this questionnaire! If you have any other comments, please write them

Thank you, your input is important!
Please return a completed survey to the researcher OR mail it using the envelope provided.

6.4 Comparative Analysis of Demographic Characteristics

TABLE 1-A: Gender difference between current and future market segments

	Have you ever visited the Whiskey Run biking trails?					
	No (Future market-n = 88)		Yes (Current market, n = 176)		Total Respondents (n = 264)	
Gender	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Male	75	85.20%	121	68.80%	196	74.20%
Female	13	14.80%	54	30.70%	67	25.40%
Non-binary	0	0.00%	1	0.60%	1	0.40%

Gender difference is statistically significant at the 95% confidence level ($\chi 2 = 8.50$, $p < .05$), with a moderate effect size (crammer's V = .2) indicating a typical difference (Vaske, 2008)

TABLE 1-B: Age difference between current and future market segments

	Have you ever visited the Whiskey Run biking trails?					
	No (Future market-n = 84)		Yes (Current market, n = 176)		Total Respondents (n = 260)	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Under 18 years	0	0.00%	1	0.60%	1	0.4
Younger working age (18–44)	48	57.10%	79	44.90%	127	48.8
Older working age (45–65)	31	36.90%	82	46.60%	113	43.5
65 and over	5	6.00%	14	8.00%	19	7.3

Age difference not statistically significant at the 95% confidence level ($\chi 2 = 3.58$, $p > .05$)

TABLE 1-C: Difference in geographical location current and future market of segments

	Have you ever visited the Whiskey Run biking trails?					
Geographical location of respondents	No (Future market-n = 79)		Yes (Current market, n = 165)		Total Respondents (n = 244)	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Central tourism region	13	16.50%	19	11.50%	32	13.10%
Coastal tourism region	1	1.30%	12	7.30%	13	5.30%
Mt. Hood/Gorge tourism region	1	1.30%	2	1.20%	3	1.20%
Portland tourism region	7	8.90%	8	4.80%	15	6.10%
Southern tourism region	3	3.80%	17	10.30%	20	8.20%
Willamette valley tourism region	18	22.80%	27	16.40%	45	18.40%
Coos County	1	1.30%	51	30.90%	52	21.30%
Out of state	35	44.30%	29	17.60%	64	26.20%

Gender difference is statistically significant at the 95% confidence level ($\chi 2 = 46.54$, $p < .001$) with a large effect size (crammer's v = .44) indicating a substantial difference (Vaske, 2008)

TABLE 1-D: Difference in race between current and future market segments

	Have you ever visited the Whiskey Run biking trails?					
	No (Future market-n = 86)		**Yes** (Current market, n = 177)		**Total Respondents** (n = 263)	
Race of respondents	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
White (Caucasian)	71	83%	156	88%	227	86.4
Hispanic or Latino	7	8%	8	5%	15	5.7
Asian	1	1%	0	0%	1	0.4
A race or ethnicity not listed here; please specify in space provided (next question)	6	7%	5	3%	11	4.2
Native American or Alaskan native	0	0%	5	3%	5	1.9
Native Hawaiian or Pacific Islander	1	1%	3	2%	4	1.5
Difference in race is not statistically significant at the 95% confidence level ($\chi 2 = 8.519, p > .05$)						

TABLE 1-E: Difference in level of education between current and future market segments

	Have you ever visited the Whiskey Run biking trails?					
	No (Future market, n = 85)		Yes (Current market, n = 174)		**Total Respondents** (n = 259)	
Education level of respondents	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Less than high school diploma	0	0.00%	1	0.60%	1	0.4
9th to 12th grade, but no diploma received	1	1.20%	0	0.00%	1	0.4
High school diploma or GED	4	4.70%	7	4.00%	11	4.2
Some college, but no degree received	11	12.90%	28	16.10%	39	15.4
Associates degree or 2-year technical school	6	7.10%	21	12.10%	27	10.4
4-year college degree (for example, bachelor's degree)	38	44.70%	56	32.20%	94	36.2
Graduate degree beyond 4-year college degree (for example, master's, Ph.D., medical doctor, law degree)	25	29.40%	61	35.10%	86	33.1
Difference in education is not statistically significant at the 95% confidence level ($\chi 2 = 7.37, p > 0.5$)						

TABLE 1-F: Difference in income level between current and future market segments

Level of Income among the respondents	Have you ever visited the Whiskey Run biking trails?					
	No (Future market, n = 84		**Yes** Current market, n = 166)		**Total Respondents** (n = 250)	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Under $25,000	2	2.4	5	3	7	2.8
$25,000 to $49,999	10	11.9	16	9.6	26	10.4
$50,000 to $74,999	9	10.7	34	20.5	43	17.5
$75,000 to $99,999	10	11.9	30	18.1	40	15.9
$100,000 to $149,999	21	25	36	21.7	57	22.7
$150,000 to $199,999	17	20.2	25	15.1	42	16.7
$200,000 to $249,999	7	8.3	8	4.8	15	6
$250,000 or more	8	9.5	12	7.2	20	8
Difference in education is not statistically significant at the 95% confidence level ($\chi 2 = 7.45$, $p > .05$)						

6.5 Recreation Attributes of Bikers at the Whiskey Run Trails

Table 2-A: Purpose of the trip to the Whiskey Run area

Purpose of visit to the Whiskey Run trails	Frequency	Percent	Valid Percent	Cumulative Percent
Primarily for biking recreation here	169	41.3	76.8	76.8
Primarily for biking recreation elsewhere	8	2	3.6	80.5
Primarily for business	7	1.7	3.2	83.6
Primarily for visiting family or friends	24	5.9	10.9	94.5
Some other reasons	12	2.9	5.5	100
Complete responses	**220**	**53.8**	**100**	
Missing responses	189	46.2		
Total number of respondents	**409**	**100**		

Table 2-B: Distance traveled by bikers to recreate at the Whiskey Run trails

Distance traveled by bikers to the Whiskey Run trails	Frequency	Percent	Valid Percent	Cumulative Percent
20 miles or less	61	14.9	29.6	29.6
21 to 50 miles	25	6.1	12.1	41.7
51 to 100 miles	17	4.2	8.3	50
101 to 300 miles	77	18.8	37.4	87.4
301 to 500 miles	14	3.4	6.8	94.2
501 to 1000 miles	7	1.7	3.4	97.6
Over 1000 miles	5	1.2	2.4	100
Complete responses	**206**	**50.4**	**100**	
Missing responses	203	49.6		
Total number of respondents	**409**	**100**		

Table 2-C: Source of information for bikers about the Whiskey Run trails

Source of information about the Whiskey Run trails	Frequency	Percent	Valid Percent	Cumulative Percent
Bike shops	24	5.9	11.3	11.3
Word of mouth	92	22.5	43.2	54.5
Internet	45	11	21.1	75.6
I live nearby	21	5.1	9.9	85.4
Mountain biker groups	25	6.1	11.7	97.2
Highway signage	6	1.5	2.8	100
Complete responses	**213**	**52.1**	**100**	
Missing responses	196	47.9		
Total number of respondents	**409**	**100**		

Table 2-D: Mode of transportation to the Whiskey Run trails

Mode of transportation	Frequency	Percent	Valid Percent	Cumulative Percent
Own car/truck	194	47.4	88.6	88.6
Bicycle	2	0.5	0.9	89.5
Camper/recreational vehicle	23	5.6	10.5	100
Complete responses	**219**	**53.5**	**100**	
Missing responses	190	46.5		
Total number of respondents	**409**	**100**		

Table 2-E: Time bikers spend recreating at the Whiskey Run trails

Time bikers spend at the Whiskey biking trails	Frequency	Percent	Valid Percent	Cumulative Percent
1 to 2 hours	69	16.9	35.4	35.4
3 to 4 hours	85	20.8	43.6	79
5 or more hours	41	10	21	100
Complete responses	**195**	**47.7**	**100**	
Missing responses	214	52.3		
Total number of respondents	**409**	**100**		

Table 2-F: Group size of bikers recreating at the Whiskey Run trails

Group size of bikers at the Whiskey Run trails	Frequency	Percent	Valid Percent	Cumulative Percent
1 Person	56	13.7	26	26
2 people	66	16.1	30.7	56.7
3 to 5 people	86	21	40	96.7
more than 5 people	7	1.7	3.3	100
Complete responses	**215**	**52.6**	**100**	
Missing responses	194	47.4		
Total number of respondents	**409**	**100**		

Table 2-G: Level of skill in bicycling for recreation at the Whiskey Run trails

Level of skill	Frequency)	Percent	Valid Percent	Cumulative Percent
Beginner	15	3.7	4.1	4.1
Novice	49	12.0	13.4	17.4
Intermediate	200	48.9	54.5	71.9
Expert	103	25.2	28.1	100.0
Complete responses	**367**	**89.7**	**100.0**	
Missing responses	42	10.3		
Total number of respondents	**409**	**100.0**		

***Note**: Chi-square = 5.09, df = 6, p-value = 0.53; n = sample size.*

Table 2-H: Frequency of bicycling for recreation at the Whiskey Run trails in a year

Frequency of biking at the Whiskey Run biking trails in a year	Frequency	Percent	Valid Percent	Cumulative Percent
Less than once a month (less than 12 times per year)	132	32.3	61.7	61.7
About once a month (12 to 18 times per year)	18	4.4	8.4	70.1
About two or three times a month (19 to 45 times per year)	18	4.4	8.4	78.5
About once a week (46 to 80 times per year)	17	4.2	7.9	86.4
About twice a week (81 to 130 times per year)	16	3.9	7.5	93.9
Three or more times a week (over 130 times per year)	13	3.2	6.1	100
Complete responses	**214**	**52.3**	**100**	
Missing responses	195	47.7		
Total number of respondents	**409**	**100**		

Table 2-I: Frequency of bicycling for recreation at the Whiskey Run trails in spring

Frequency of biking at the Whiskey Run trails in spring	Skill level in bicycling for recreation (Beginner (n=5)		Novice (n=25)		Intermediate (n=55)		Expert (n=31)		Total (n=116)	
Once a week	3	60.0%	13	52.0%	24	43.6%	18	58.1%	58	50.0%
Twice a week	2	40.0%	8	32.0%	17	30.9%	5	16.1%	32	27.6%
3 or more times a week	0	0.0%	4	16.0%	14	25.5%	8	25.8%	26	22.4%

Table 2-J: Frequency of biking at Whiskey Run in a year

Frequency of biking at Whiskey Run in a year	Frequency	Percent	Valid Percent	Cumulative Percent
Less than once a month (less than 12 times per year)	132	32.3	61.7	61.7
About once a month (12 to 18 times per year)	18	4.4	8.4	70.1
About two or three times a month (19 to 45 times per year)	18	4.4	8.4	78.5
About once a week (46 to 80 times per year)	17	4.2	7.9	86.4
About twice a week (81 to 130 times per year)	16	3.9	7.5	93.9
Three or more times a week (over 130 times per year)	13	3.2	6.1	100
Complete responses	**214**	**52.3**	**100**	
Missing responses	195	47.7		
Total number of respondents	**409**	**100**		

Table 2-K: Frequency of biking at Whiskey Run in summer

	Skill level in bicycling for recreation									
Frequency of biking at Whiskey Run in summer	**Beginner** (n=5)		**Novice** (n=30)		**Intermediate** (n=83)		**Expert** (n=42)		**Total** (n=160)	
Once a week	2	40.0%	15	50.0%	39	47.0%	17	40.5%	73	45.6%
Twice a week	2	40.0%	8	26.7%	20	24.1%	11	26.2%	41	25.6%
3 or more times a week	1	20.0%	7	23.3%	24	28.9%	14	33.3%	46	28.7%

Note: *Chi-square = 1.68, df = 6, p-value = 0.95; n = sample size*

Table 2-L: Frequency of biking at Whiskey Run in fall

	Skill level in bicycling for recreation									
Frequency of biking at Whiskey Run in fall	**Beginner** (n=3)		**Novice** (n=31)		**Intermediate** (n=57)		**Expert** (n=32)		**Total** (n=123)	
Once a week	1	33.3%	22	71.0%	26	45.6%	15	46.9%	64	52.0%
Twice a week	1	33.3%	6	19.4%	16	28.1%	6	18.8%	29	23.6%
3 or more times a week	1	33.3%	3	9.7%	15	26.3%	11	34.4%	30	24.4%

Note*: Chi-square = 8.36, df = 6, p-value = 0.21; n = sample size*

Table 2-M: Frequency of biking at Whiskey Run in winter

	Skill level in bicycling for recreation									
Frequency of biking at Whiskey Run in winter	**Beginner** (n=1)		**Novice** (n=14)		**Intermediate** (n=30)		**Expert** (n=20)		**Total** (n=65)	
Once a week	1	100.0%	11	78.6%	13	43.3%	1	55.0%	36	55.4%
Twice a week	0	0.0%	1	7.1%	11	36.7%	5	25.0%	17	26.2%
3 or more times a week	0	0.0%	2	14.3%	6	20.0%	4	20.0%	12	18.5%

Note*: Chi-square = 6.36, df = 6, p-value = 0.38; n = sample size*

Table 2-N: Frequency of biking at Whiskey Run in spring

	Skill level in bicycling for recreation									
Frequency of biking at Whiskey Run in spring	**Beginner** (n=5)		**Novice** (n=25)		**Intermediate** (n=55)		**Expert** (n=31)		**Total** (n=116)	
Once a week	3	60.0%	13	52.0%	24	43.6%	18	58.1%	58	50.00%
Twice a week	2	40.0%	8	32.0%	17	30.9%	5	16.1%	32	27.60%
3 or more times a week	0	0.0%	4	16.0%	14	25.5%	8	25.8%	26	22.40%

Note: *Chi-square = 5.09, df = 6, p-value = 0.53; n = sample size*

Table 2-O: Validating measures of satisfaction and importance variables

Measures of satisfaction and importance variables	**Item total correlation**	**Alpha if item deleted**	**Cronbach Alpha**
Satisfaction with experience at the Whiskey Run trails			.888
…the bicycling experience here was satisfying to me	.771	.862	

…the general recreation experience here was satisfying to me	.758	.862	
…the natural environment I experienced here was satisfying to me	.549	.888	
…the facilities available here (e.g., parking) were satisfying to me	.554	.890	
…I am happy with the experience I had here	.802	.858	
…the experience I had here was as good as I expected	.656	.876	
…I felt comfortable with the experience I had here	.756	.856	
Importance of biking at the Whiskey Run trails			.940
Unimportant – Important	.712	.933	
Irrelevant – Relevant	.718	.928	
Means nothing to me – Means a lot to me	.723	.926	
Does not matter to me – Matters to me	.903	.914	
Of no concern to me – Of concern to me	.834	.929	

Table 2-P: Validating measures of likelihood of revisiting and recommending variables

Measures of satisfaction and importance variables	**Item total correlation**	**Alpha if item deleted**	**Cronbach Alpha**
Likelihood of revisiting			.751
I will revisit the Whiskey Run biking trails in the future	.527	.729	
I am likely to schedule multiple visits to the Whiskey Run biking trails	.694	.642	
I will NOT schedule my next visit to the Whiskey Run biking trails	.455	.735	
The Whiskey Run biking trails would be my first choice if I wanted to do mountain biking	.569	.697	
If asked to, I would register as a member of the Whiskey Run biking association	.526	.717	
Likelihood of recommending			.913
I would recommend bicycling at the Whiskey Run biking trails to someone else	.837	.864	
I'm likely to talk about how happy the bicycling experience at the Whiskey Run biking trails was to others	.844	.858	
I would mention the Whiskey Run biking trails if someone else wanted a bicycling recreation experience	.794	.899	

6.6 Recreation Attributes of the Whiskey Run Trails

Table 3-A: Differences in the perceived importance of recreation facilities at the Whiskey Run trails compared among bikers who have visited and those who have not.

		Have you ever visited the Whiskey Run biking trails?				
Biking recreation facilities	**All respondents** (n=409)	**No** (37%)	**Yes** (63%)	**t-value**	**p-value**	**Effect size** (Cohen's d)
Pit toilets	4.02	3.99	4.04	0.41	0.648	-0.046
Showers	1.70	1.69	1.71	0.14	0.889	-0.016
Rinse stations	2.40	2.41	2.40	0.08	0.938	0.009
Trash cans	4.19	4.26	4.15	0.90	0.338	0.1
Picnic tables	3.12	3.14	3.11	0.24	0.814	0.026
Tables with shade	2.87	2.84	2.88	0.33	0.742	-0.037
Information signs-guidelines	4.14	4.16	4.13	0.21	0.834	0.023
Bike racks with electric charge station	1.60	1.70	1.53	1.36	0.176	0.158
Bike racks with no electric charging station	2.18	2.35	2.07	1.85	0.066	0.208
Bike repair tools available	2.68	2.69	2.67	0.15	0.883	0.017
Bike rental/repair service	2.14	2.08	2.18	0.70	0.484	-0.079
Food service	2.21	2.14	2.26	0.79	0.432	-0.088
Shuttle service	2.21	2.51	2.02	3.39*	0.001	0.381
Lodging service	2.19	2.24	2.16	0.53	0.598	0.059
Camping service	3.39	3.37	3.41	0.26	0.797	-0.028
Directional signs within trails	4.54	4.58	4.51	0.76	0.448	0.085
Directional signs to trails	4.28	4.42	4.19	2.22*	0.027	0.235
Vehicle parking at trailheads	4.76	4.77	4.76	0.22	0.830	0.024

Note: *Cell entries are means on a 5-point scale of 1= "not important" to 5 "very important"; Results show no significant differences in perceptions of importance. Significant differences seen for two facilities (shuttle service and directional signs to trails) are small according to Cohen (1988).*

Table 3-B: Comparison of perceived importance of recreation facilities at the Whiskey Run trails by biking recreation skill level.

Biking recreation facilities	Skill level in bicycling for recreation												
	Beginner (n=14)		**Novice** (n=44)		**Intermediate** (n=183)		**Expert** (n=98)		**Total** (n=339)				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F	Sig.	Eta
Pit toilets*	4.71[a]	0.61	4.00	1.08	4.06	1.10	3.88[b]	1.17	4.02	1.11	2.47	0.06	0.15
Showers	2.21	1.12	1.50	0.90	1.69	1.06	1.74	1.16	1.70	1.08	1.64	0.18	0.12
Rinse station*	3.43[a]	1.70	2.35	1.33	2.44	1.29	2.21[b]	1.30	2.40	1.33	3.64	0.01	0.18
Trash cans	4.29	1.44	4.27	0.69	4.21	1.08	4.09	1.18	4.19	1.08	0.42	0.74	0.06
Picnic tables	3.57	1.16	3.30	1.11	3.10	1.11	3.01	1.24	3.12	1.16	1.36	0.26	0.11
Picnic tables with shade/rain protection	3.64	1.34	2.82	1.42	2.87	1.22	2.77	1.25	2.87	1.27	1.98	0.12	0.13
Information signs about guidelines	4.21	1.25	3.98	1.07	4.20	0.90	4.08	1.04	4.14	0.98	0.78	0.51	0.08
Bike racks with electric charging station*	2.79[a]	1.58	1.34[b]	0.71	1.59	1.10	1.55	1.09	1.60	1.10	6.61	<.001	0.24
Bike racks without electric charging station*	3.15[a]	1.77	2.20	1.44	2.19	1.35	2.01[b]	1.33	2.18	1.39	2.66	0.05	0.15
Bike repair tools	3.21	1.31	2.73	1.28	2.65	1.33	2.62	1.28	2.68	1.31	0.88	0.45	0.09
Bike rental and repair service*	3.07	1.59	2.25	1.30	2.06	1.24	2.11	1.33	2.14	1.30	2.81	0.04	0.16
Food service	3.00	1.62	2.16	1.43	2.18	1.32	2.19	1.31	2.21	1.35	1.68	0.17	0.12
Shuttle service	2.93	1.49	2.18	1.33	2.17	1.29	2.19	1.31	2.21	1.31	1.48	0.22	0.12
Lodging service*	2.64	1.45	1.82	1.24	2.14	1.22	2.41	1.36	2.19	1.28	2.91	0.04	0.16
Camping service*	3.21	1.67	2.73[b]	1.56	3.32	1.41	3.85[a]	1.24	3.39	1.43	7.08	<.001	0.25
Directional signs within the biking trails	4.21	1.42	4.57	0.79	4.57	0.66	4.51	0.82	4.54	0.77	0.99	0.40	0.09
Directional signs to biking trails	4.07	1.39	4.34	0.96	4.34	0.91	4.16	1.10	4.28	0.99	0.92	0.43	0.09
Parking for vehicles at trailheads	4.71	1.07	4.73	0.45	4.76	0.49	4.79	0.43	4.76	0.50	0.25	0.86	0.05

Note: *Cell entries are means on a 5-point scale of 1 = "not important" to 5 = "very important"; Means with different letter superscripts differ statistically using Tamhane's post hoc tests for unequal variances; F-value represents the Lavene's test for homogeneity; Some of the significant differences shown above (e.g., the importance of lodging services) are minimal (effect size = 0.16) and therefore less meaningful (Vaske, 2008).*

Table 3-C: Perceived support of recreation services at the Whiskey Run trails compared among bikers who have visited and those who have not.

		Have you ever visited the Whiskey Run biking trails?				
Recreation services	**Total (n = 409)**	**No** (37%)	**Yes** (63%)	**t-value**	**p-value**	**Effect size (Cohen's d)**
Information kiosk	4.01	4.22	3.80	4.83	<.001	0.53
Lodge/motel	2.84	2.97	2.70	2.33	0.02	0.25
Recreational vehicle park/camping area	3.88	3.94	3.81	1.10	0.27	0.12
Log cabins	3.04	3.11	2.96	1.27	0.21	0.15
Food service	3.19	3.24	3.14	0.84	0.40	0.10
Restrooms at trailheads	4.47	4.55	4.39	2.16	0.03	0.25
Tent campground with bathrooms at trailheads	3.78	3.93	3.63	2.39	0.02	0.27

Note: *Cell entries are means on a 5-point scale of 1= "strongly oppose" to 5 "strongly support"; Results show significant differences in perceptions of support for some recreation services. Significant differences seen for four services (information kiosk, lodge/motel, restrooms at trailheads, and tent campground) range from small to medium according to Cohen (1988), and therefore not concerning.*

Table 3-D: Perceived support for recreation services at the Whiskey Run trails compared by biking recreation skill level.

	Skill level in bicycling for recreation							
Recreation services	**Total** (n = 323)	**Beginner** (n = 13)	**Novice** (n = 43)	**Intermediate** (n = 175)	**Expert** (n = 92)	F	Sig.	Eta(η)
Information kiosk	3.96	3.54	3.7	3.97	4.12	3.75	0.01	0.19
Lodge/motel	2.8	3.08	2.56	2.78	2.92	1.49	0.22	0.12
Recreational vehicle park/camping area	3.86	3.93	3.49[a]	3.81	4.12[b]	3.34	0.02	0.17
Log cabins	3.02	3.15	2.88	3.02	3.05	0.32	0.81	0.05
Food service	3.18	3.54	3	3.13	3.29	1.35	0.26	0.11
Restrooms at trailheads	4.45	4.5	4.35	4.45	4.49	0.47	0.71	0.07
Tent campground with bathrooms at trailheads	3.75	3.69	3.3[a]	3.73	4[b]	3.97	0.01	0.19

Note: *Cell entries are means on a 5-point scale of 1= "strongly oppose" to 5 "strongly support"; Means with different letter superscripts differ statistically using Tamhane's post hoc tests for unequal variances; F-value represents the Lavene's test for homogeneity; Some of the significant differences shown above (e.g., the importance of lodging services) are minimal (effect size = 0.16) and therefore less meaningful (Vaske, 2008).*

Table 3-E: Potential effect of recreation services on biking at the Whiskey Run trails.

		Skill level in bicycling for recreation						
	Total (311)	**Beginner (n = 12)**	**Novice (39)**	**Intermediate (n = 171)**	**Expert (n = 89)**	**F**	Sig.	Eta(η)
Information kiosk	2.39	2.42	2.36	2.41	2.36	0.17	0.92	0.04
Lodge/motel	2.08	2.25	1.85[c]	2[b]	2.3[b]	4.39	0.01	0.20
Recreational vehicle park/camping area	2.69	2.55	2.36[c]	2.63[b]	2.96[a]	4.39	0.01	0.20
Log cabins	2.18	2.25	2.03	2.15	2.32	1.60	0.19	0.12
Food service	2.4	2.67	2.23	2.37	2.49	1.61	0.19	0.13
Restrooms at trailheads	2.81	3.08	2.82	2.81	2.78	0.48	0.70	0.07
Tent campground with bathrooms at trailheads	2.73	2.58	2.44[c]	2.66[b]	3.01[a]	4.38	0.01	0.20

Note: *Cell entries are means on a 5-point scale of 1= "lead to decrease" to 5 "lead to large increase"; Means with different letter superscripts differ statistically using Tamhane's post hoc tests for unequal variances; F-value represents the Lavene's test for homogeneity; Some of the significant differences shown above (e.g., lodge/model, recreational vehicle parking/camping area, and tent campground with bathroom at trailheads) are typical (effect size = 0.20) and therefore less surprising (Vaske, 2008).*

Table 3-F: Support for new recreation management actions compared among bikers who have visited and those who have not.

	Have you ever visited the Whiskey Run biking trails?						
	No (n = 99)		**Yes** (n = 188)		**t-test for equality of means**		
New management actions	Mean	SD	Mean	SD	t-value	p-value	Cohen's d
Provide directional trails (e.g., uphill only, downhill only).	4.33	0.80	4.32	0.67	0.16	0.87	0.02
Restrict the number of people allowed to bike in this area.	2.21	0.86	2.20	0.89	0.15	0.88	0.02
Improve maintenance or upkeep of trails in this area.	4.30	0.74	4.32	0.68	-0.33	0.74	-0.04
Provide more facilities or services in this area (trash cans and restrooms).	4.16	0.75	4.08	0.75	0.82	0.41	0.10
Provide easy, smooth, and beginner friendly trails (i.e., green circle)	3.92	0.90	3.81	0.90	0.95	0.34	0.12
Provide somewhat challenging trails for intermediate users (i.e., blue square)	4.41	0.71	4.43	0.59	-0.25	0.80	-0.03
Provide very challenging, difficult, and technical trails (i.e., black diamond)	4.29	0.88	4.27	0.79	0.21	0.83	0.03
Provide extremely challenging, difficult, and technical trails (i.e., double black diamond)	4.00	0.93	3.85	0.95	1.27	0.21	0.16
Provide primitive trails with many natural features of varying difficulty	4.23	0.97	4.16	0.80	0.72	0.47	0.09
Provide a mountain biking skills park	4.19	0.90	3.99	1.01	1.67	0.10	0.21
Organize mountain biking race events	3.86	0.90	3.70	0.98	1.37	0.17	0.17
Provide night biking trails	3.66	0.92	3.68	0.98	-0.17	0.86	-0.02
Provide trails for electric bicycle users	3.09	1.22	3.07	1.27	0.12	0.91	0.01
Expand the trails to increase miles of available trail	4.61	0.71	4.64	0.63	-0.46	0.65	-0.06
Diversify the type of trails available to bikers	4.44	0.72	4.38	0.71	0.69	0.49	0.09
Provide public transportation to trailheads	3.67	0.89	3.49	0.94	1.57	0.12	0.20
Provide food services	3.22	0.93	3.11	1.04	0.88	0.38	0.11
Provide lodging services	3.04	0.95	2.87	1.06	1.38	0.17	0.17
Expand parking at trailheads	4.08	0.77	3.82[a]	0.78	2.67[b]	0.01	0.33
Keep things as they are now	2.87	0.68	3.13	0.81	-2.70	0.01	-0.34

Note: *Cell entries are means on a 5-point scale of 1= "Strongly oppose" to 5 "strongly support"; Results show no significant differences in perceptions of importance-therefore data can be combined. Significant differences seen for two management actions (expand parking at trailheads and keeping things are they are now) is small according to Cohen (1988), and therefore not concerning.*

Table 3-G: Support for new recreation management actions compared by biking skill level.

		Skill level in bicycling for recreation						
New management actions	**Total** (n = 287)	**Beginner** (n = 10)	**Novice** (n = 35)	**Intermediate** (n = 161)	**Expert** (n = 81)	F	Sig.	Eta
Provide directional trails (e.g., uphill only, downhill only).	4.32	4.20	4.20	4.31	4.42	0.95	0.42	0.10
Restrict the number of people allowed to bike in this area.	2.20	2.80	2.54	2.17	2.04	4.47	0.00	0.21
Improve maintenance or upkeep of trails in this area.	4.31	4.20	4.37	4.27	4.39	0.69	0.56	0.09
Provide more facilities or services in this area (trash cans and restrooms).	4.11	4.10	4.09	4.11	4.13	0.04	0.99	0.02
Provide easy, smooth, and beginner friendly trails (i.e., green circle)	3.85	4.60	4.14	3.92	3.50	8.64	<.001	0.29
Provide somewhat challenging trails for intermediate users (i.e., blue square)	4.43	4.30	4.09	4.47	4.50	4.33	0.01	0.21
Provide very challenging, difficult, and technical trails (i.e., black diamond)	4.28	4.00	3.77	4.21	4.66	12.43	<.001	0.34
Provide extremely challenging, difficult, and technical trails (i.e., double black diamond)	3.90	3.60	3.60	3.76	4.35	9.91	<.001	0.31
Provide primitive trails with many natural features of varying difficulty	4.18	3.80	3.83	4.09	4.56	8.99	<.001	0.30
Provide a mountain biking skills park	4.06	4.00	3.74	3.99	4.35	4.01	0.01	0.20
Organize mountain biking race events	3.75	3.90	3.51	3.70	3.94	2.03	0.11	0.15
Provide night biking trails	3.67	3.40	3.34	3.68	3.82	2.33	0.08	0.16
Provide trails for electric bicycle users	3.08	3.30	2.77	3.15	3.05	0.99	0.40	0.10
Expand the trails to increase miles of available trail	4.63	4.10	4.29	4.68	4.74	6.93	<.001	0.26
Diversify the type of trails available to bikers	4.40	4.10	4.14	4.44	4.48	2.66	0.05	0.17
Provide public transportation to trailheads	3.55	3.70	3.43	3.59	3.49	0.50	0.68	0.07
Provide food services	3.15	3.40	3.12	3.12	3.18	0.28	0.84	0.05
Provide lodging services	2.93	3.11	2.86	2.92	2.94	0.15	0.93	0.04
Expand parking at trailheads	3.91	3.40	3.88	3.93	3.95	1.54	0.20	0.13
Keep things as they are now	3.05	2.90	3.20	3.06	2.96	0.91	0.44	0.10

Note: *Cell entries are means on a 5-point scale of 1= "Strongly oppose" to 5 "Strongly support"; Means with different letter superscripts differ statistically using Tamhane's post hoc tests for unequal variances; F-value represents the Lavene's test for homogeneity.*

Table 3-H: Top-ranked recreation management actions compared by biking skill level.

		Skill level in bicycling for recreation						
Top-ranked management actions	**Total** (n = 287)	**Beginner** (n = 10)	**Novice** (n = 35)	**Intermediate** (n = 161)	**Expert (n = 81)**	**F**	**Sig.**	**Eta**
Expand the trails to increase miles of available trail	4.6	4.1[b]	4.3[b]	4.7	4.7[a]	6.93	<.001	0.26
Provide somewhat challenging trails for intermediate users (i.e., blue square)	4.4	4.3	4.1[b]	4.5[a]	4.5[a]	4.33	<.05	0.21
Diversify the type of trails available to bikers	4.4	4.1	4.1	4.4	4.5	2.66	0.05	0.17
Provide directional trails (e.g., uphill only, downhill only).	4.3	4.2	4.2	4.3	4.4	0.95	0.42	0.10
Improve maintenance or upkeep of trails in this area.	4.3	4.2	4.4	4.3	4.4	0.69	0.56	0.09
Provide very challenging, difficult, and technical trails (i.e., black diamond)	4.3	4.0	3.8[b]	4.2[b]	4.7[a]	12.43	<.001	0.34
Provide primitive trails with many natural features of varying difficulty	4.2	3.8[b]	3.8[b]	4.1[b]	4.6[a]	8.99	<.001	0.30
Provide more facilities or services in this area (trash cans and restrooms).	4.1	4.1	4.1	4.1	4.1	0.04	0.99	0.02
Provide a mountain biking skills park	4.1	4.0	3.7	4.0	4.4	4.01	<.01	0.20
Expand parking at trailheads	3.9	3.4	3.9	3.9	4.0	1.54	0.20	0.13

Note: *Cell entries are means on a 5-point scale of 1= "Strongly oppose" to 5 "Strongly support"; Means with different letter superscripts differ statistically using Tamhane's post hoc tests for unequal variances; F-value represents the Lavene's test for homogeneity. Post-hoc test results show that means with superscript a are statistically higher than means with superscript b.*

Table 3-I: Priority recreation management actions for unskilled bikers at the Whiskey Run trails.

	Effect on bicycling recreation activity at the Whiskey Run trails			
New management actions	**Beginner bikers**	**Novice bikers**	**Unskilled bikers**	**Implementation priority**
Provide easy, smooth, and beginner-friendly trails (i.e., green circle)	4.6	4.14	4.37	1
Improve maintenance or upkeep of trails in this area.	4.2	4.37	4.29	2
Provide directional trails (e.g., uphill only, downhill only).	4.2	4.2	4.20	3
Provide somewhat challenging trails for intermediate users (i.e., blue square)	4.3	4.09	4.20	4
Expand the trails to increase miles of available trail	4.1	4.29	4.20	5
Diversify the type of trails available to bikers	4.1	4.14	4.12	6
Provide more facilities or services in this area (trash cans and restrooms).	4.1	4.09	4.10	7
Provide very challenging, difficult, and technical trails (i.e., black diamond)	4	3.77	3.89	8
Provide a mountain biking skills park	4	3.74	3.87	9
Provide primitive trails with many natural features of varying difficulty	3.8	3.83	3.82	10
Organize mountain biking race events	3.9	3.51	3.71	11
Expand parking at trailheads	3.4	3.88	3.64	12
Provide extremely challenging, difficult, and technical trails (i.e., double black diamond)	3.6	3.6	3.60	13
Provide public transportation to trailheads	3.7	3.43	3.57	14
Provide night biking trails	3.4	3.34	3.37	15
Provide food services	3.4	3.12	3.26	16
Keep things as they are now	2.9	3.2	3.05	17
Provide trails for electric bicycle users	3.3	2.77	3.04	18
Provide lodging services	3.11	2.86	2.99	19
Restrict the number of people allowed to bike in this area.	2.8	2.54	2.67	20

Note: *Cell entries are means on a 4-point scale of 1 = "Strongly oppose", 2 = "No effect", 3 = "lead to a small increase", 5= "Strongly support"; * = average mean score for both beginners and novice bikers*

Table 3-J: Priority recreation management actions for skilled bikers at the Whiskey Run trails.

	Effect on bicycling recreation activity at the Whiskey Run trails			
New management actions	**Intermediate bikers**	**Expert bikers**	**Skilled bikers***	**Implementation priority**
Expand the trails to increase miles of available trail	4.68	4.74	4.71	1
Provide somewhat challenging trails for intermediate users (i.e., blue square)	4.47	4.5	4.49	2
Diversify the type of trails available to bikers	4.44	4.48	4.46	3
Provide very challenging, difficult, and technical trails (i.e., black diamond)	4.21	4.66	4.44	4
Provide directional trails (e.g., uphill only, downhill only).	4.31	4.42	4.37	5
Improve maintenance or upkeep of trails in this area.	4.27	4.39	4.33	6
Provide primitive trails with many natural features of varying difficulty	4.09	4.56	4.33	7
Provide a mountain biking skills park	3.99	4.35	4.17	8
Provide more facilities or services in this area (trash cans and restrooms).	4.11	4.13	4.12	9
Provide extremely challenging, difficult, and technical trails (i.e., double black diamond)	3.76	4.35	4.06	10
Expand parking at trailheads	3.93	3.95	3.94	11
Organize mountain biking race events	3.7	3.94	3.82	12
Provide night biking trails	3.68	3.82	3.75	13
Provide easy, smooth, and beginner-friendly trails (i.e., green circle)	3.92	3.5	3.71	14
Provide public transportation to trailheads	3.59	3.49	3.54	15
Provide food services	3.12	3.18	3.15	16
Provide trails for electric bicycle users	3.15	3.05	3.10	17
Keep things as they are now	3.06	2.96	3.01	18
Provide lodging services	2.92	2.94	2.93	19
Restrict the number of people allowed to bike in this area.	2.17	2.04	2.11	20

Note: *Cell entries are means on a 4-point scale of 1 = "Strongly oppose", 2 = "No effect", 3 = "lead to small increase", 5 = "Strongly support"; * = average mean score for both intermediate and expert bikers*