Research Report

Detroit Mountain Recreation Area 2021 Summer Visitor Profile

PREPARED FOR *Greater Minnesota Regional Parks and Trails Commission*

BY *Parks & Trails Council of Minnesota*

December 2021

About the Parks & Trails Council

Parks & Trails Council of Minnesota is a 501(c)(3) organization dedicated to acquiring, protecting, and enhancing critical land for the public's use and benefit. Founded in 1954, the Parks & Trails Council acquires threatened and critical parcels of land, advocates at the Minnesota Capitol, supports volunteers, and produces original research on issues and trends facing Minnesota's parks and trails.

More information about Parks & Trails Council is available at www.parksandtrails.org.

About the Greater Minnesota Regional Parks and Trails Commission

Greater Minnesota Regional Parks and Trails Commission is comprised of 13 members appointed by the governor, two members from each of the six districts and one at-large member. The Greater Minnesota Regional Parks and Trails Commission was created to undertake system planning and provide recommendations to the legislature for grants from the Parks and Trails Legacy Fund to counties and cities outside of the seven-county metropolitan area that have been designated as regionally significant.

More information about the Greater Minnesota Regional Parks and Trails Commission is available at www.gmrptcommission.org.

Contents

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Cover: Riding Detroit Mountain. Photo courtesy Detroit Mountain Recreation Area.

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Executive Summary

Detroit Mountain Recreation Area
2021 Summer Visitor Profile

About: Detroit Mountain Recreation Area (DMRA), located just outside of Detroit Lakes, is a 360-acre recreation area with 15+ miles of singletrack mountain biking trails. The bike park offers lift-serviced downhill gravity trails and a cross-country trail system with numerous loops for all ages and skill levels. DMRA has been part of the designated Greater Minnesota Regional Parks and Trails System since 2015.

Trail Traffic Estimates

≈10,000
visits to the cross-country trail system

11am Weekend peak

6pm Weekday peak

46%
of trail use occurs on weekends

Visitor Demographics

- Men **80%**
- Women **20%**
- Average age **≈32**

- Gen Z **43%**
- Millennials **18%**
- Gen X **36%**
- Baby Boomers **7%**

- White **90%**
- Native American **3%**
- Hispanic **2%**
- Some other race **2%**

- Bachelor's degree **62%**
- Income over $100k **61%**
- Disability **7%**

Trail Experience

93%
mountain biking

68%
visiting to improve physical health

61%
visiting to experience nature

40%
visiting with children

26%
First-time visitors

80%
Rated the trail "very good"

Trail Tourism

51% from Minnesota

42% of visitors stayed overnight in the Detroit Lakes Area

14 Different states represented +1 U.S. Territory

68% of overnight visitors stayed in a private home (cabin or home of friend)

38% stayed in the Detroit Lakes Area for 5+ nights

77% said DMRA was *at least* part of the reason they visited the Detroit Lakes Area

> **I love coming to Detroit Mountain.** Great park and great staff.
>
> ~ Visitor from Fargo, ND

> The trails are an **asset to Minnesota.**
>
> ~ Visitor from Minneapolis, MN

Rider Characteristics

- **7%** beginner level skills
- **50%** intermediate
- **35%** advanced
- **8%** expert

Information Sources

63% use the DMRA website to learn about the trails

Methodology: In 2021 the Greater Minnesota Regional Parks and Trails Commission contracted with Parks & Trails Council to conduct a visitor profile for Detroit Mountain Recreation Area (DMRA). Automated counters were installed at three locations across the trail system, and a systematic visitor intercept survey collected information on visitor characteristics (n = 116). Results are representative of summer (Memorial Day through Labor Day) visitors to DMRA during 2021 and have a margin of error of +/- 9.1 percentage points.

For full results and methodology, see the full Visitor Profile Report.

Introduction

Detroit Mountain Recreation Area (DMRA), located in northwestern Minnesota near Detroit Lakes, offers over 15 miles of singletrack mountain biking trails that wind through 360 acres of northern hardwood forest (Figure 1). The recreation area's bike park offers trails for all riding abilities and is anchored by its namesake Detroit Mountain, which rises over 200 feet and offers breathtaking views of the surrounding lake country. The park's downhill gravity trails showcase berms, jumps and plenty of wooden features, while an extensive cross-country trail system offers numerous beginner, intermediate and advanced loops. Lift service is provided throughout the summer on weekends, holidays and Fridays in July, and a full-service lodge offers bike rentals and a restaurant. The recreation area is managed by Detroit Mountain Recreation Area, Inc. in partnership with the City of Detroit Lakes, and was designated and became a part of the Greater Minnesota Regional Park and Trail System in 2015.

In 2021 the Greater Minnesota Regional Parks and Trails Commission (GMRPTC) contracted with Parks & Trails Council of Minnesota (P&TC) to study the visitor profile and use of DMRA's mountain biking trail system. GMRPTC is responsible for system planning and providing recommendations to the legislature for grants funded by the Parks and Trails Legacy Fund to counties and cities outside the seven-county metropolitan area. The visitor profile was undertaken to understand user numbers, visitor origination, trip characteristics and basic demographics of trail users. Ultimately, this data is meant to help inform planning and marketing efforts by GMRPTC and collaborative partners.

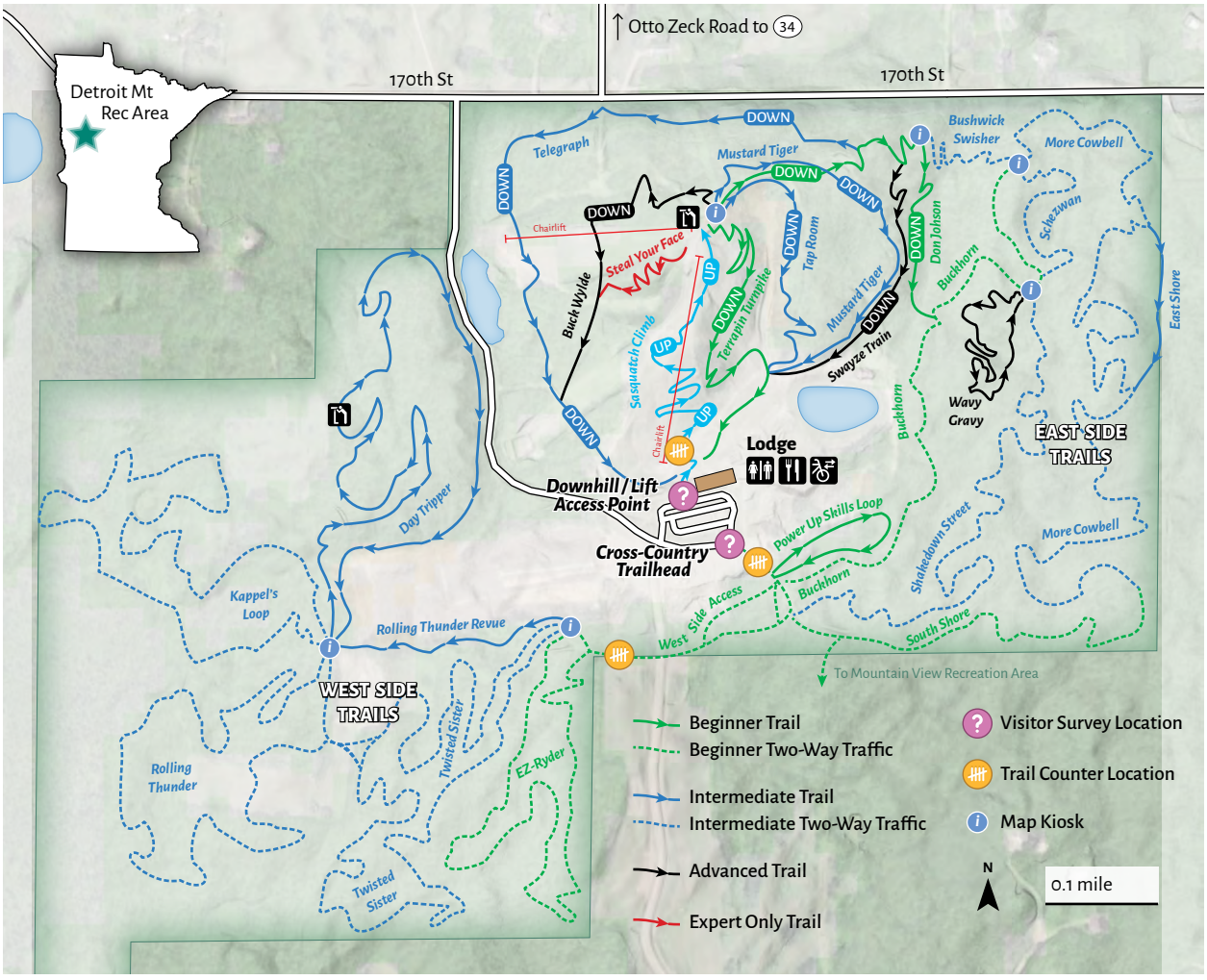
This visitor profile consists of two parts. First, automated trail counters were installed at three locations across the trail system (Figure 1). The trail counters collected data on total traffic, travel direction, hourly patterns, and weekly patterns. Second, a systematic intercept visitor survey was conducted. Staff used electronic tablets to collect surveys during high and low-use periods (mornings and afternoons, weekdays and weekends). A total of 116 surveys were collected. Together, the trail counts and visitor surveys provide a snapshot of how many people use DMRA's mountain biking trails, and who those people are.

The visitor studies were conducted during the summer and early fall of 2021 and designed to be representative of the summer season, defined as Memorial Day through Labor Day. Importantly, DMRA is a year-round destination. The recreation area is a ski resort during the winter, offering downhill skiing, tubing, snowboarding, and cross-country skiing, and is a year-round event venue (e.g., weddings, festivals, etc.). *This report focuses exclusively on summer visitors using the mountain biking trail system*. Visitors to DMRA during other seasons, or for other uses, were beyond the scope of this project. As such, readers should understand this report quantifies only a portion of DMRA's full impact on the regional community.

For more details on this report's methods, see our methodology.

Figure 1

DMRA Mountain Biking Trails



Trail Traffic Estimates

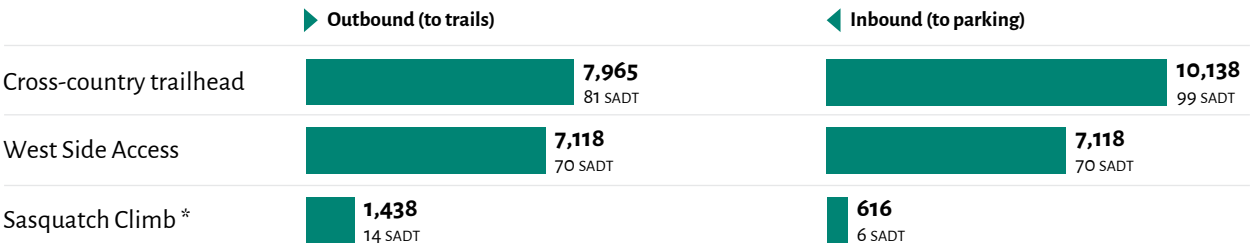
DMRA's cross-country trail system received over 10,000 "visits" during summer 2021

DMRA's cross-country trail system is accessed primarily by a trailhead in the southeastern corner of the parking area across from the lodge. A trail counter was installed inside the entrance gate, between the parking area and the Power Up Skills Loop, a location which should capture nearly every user of the cross-country trail system.[1] Overall, the trailhead counter recorded 10,138 people exiting the trail system during summer 2021 (Figure 2).[2]

Interestingly, only 7,965 people were recorded entering the system. This gap between outbound traffic (entering the trail system) and inbound traffic (returning to the parking lot) is not entirely understood, but is likely due to visitors entering the cross-country trail system from the downhill gravity trails and then exiting at the trailhead. Several pieces of evidence suggest this is the case. For example, uphill traffic on the Sasquatch Climb (the only access to the downhill trails on weekdays) is approximately equal to the inbound/outbound gap at the trailhead (Figure 3). The inbound/outbound gap is also larger on weekends (when lifts are running and all downhill trails are open), though only

Figure 2

Summer traffic estimates



Notes:
Summer is defined as Saturday, May 29, 2021 through Monday, September 6, 2021 (Saturday of Memorial Day weekend through Labor Day).
SADT = Summer Average Daily Traffic.
* "Outbound" on the Sasquatch Climb is uphill. Sasquatch Climb was closed for reconstruction during the second-half of summer 2021. Estimates above are for a hypothetical year in which Sasquatch Climb was open all summer.

1 The only cross-country visitors who don't pass through the entrance gate at the trailhead are those who (1) arrive and exit via the Mountain View Recreation Area connector trail or (2) ride off trail, which is prohibited. It's not believed many visitors arrive from Mountain View, and DMRA staff monitor off-trail riding closely.
2 "People" here refers to every time a visitor exited the trails through the gate. Visitors doing loops (via the downhill trails) would be counted twice (or however many loops they completed).

marginally so. Future research is needed to study, confirm and understand the in/out flow at the trailhead.

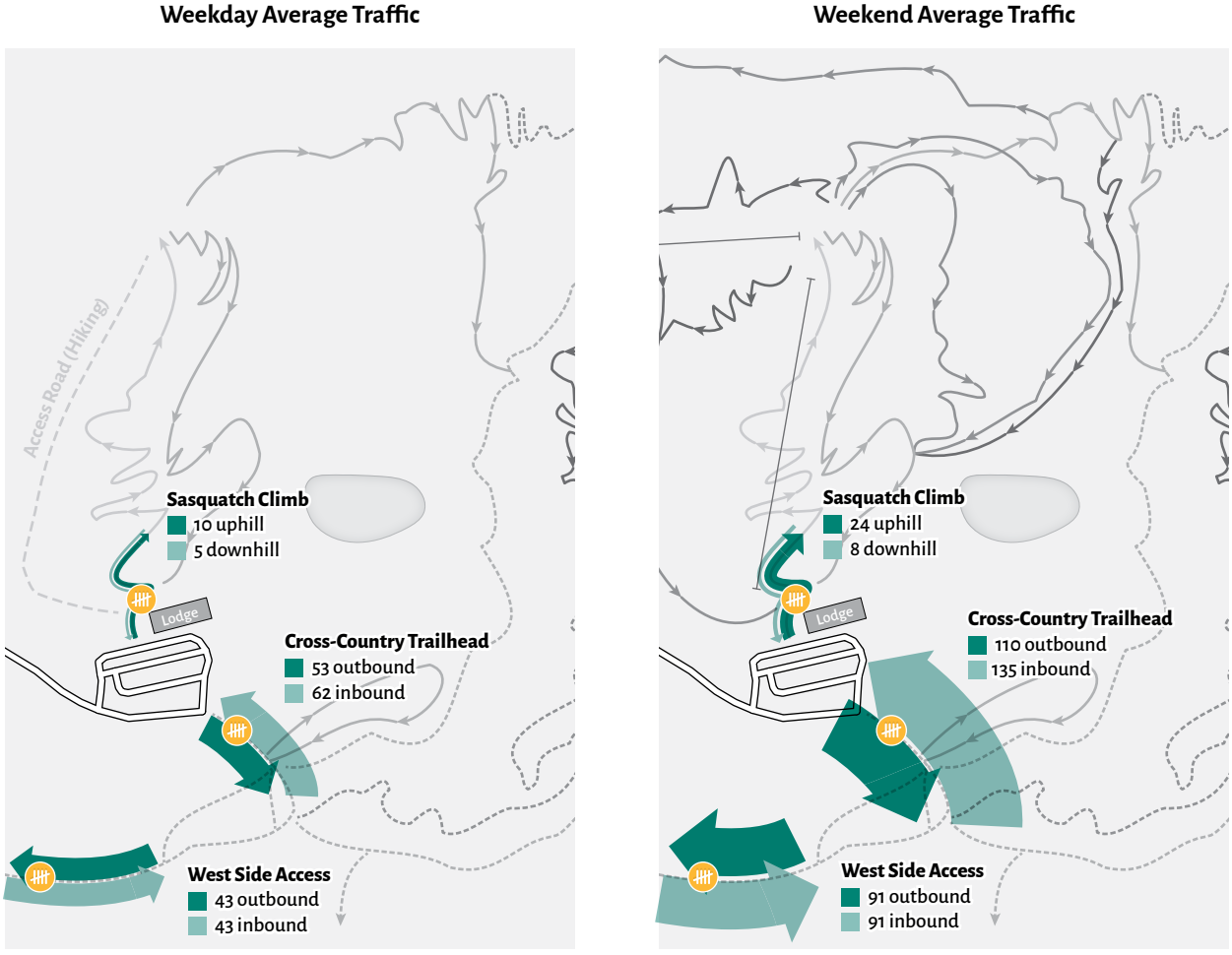
The overall traffic at the cross-country trailhead should be interpreted with two caveats. First, approximately 15% of total summer traffic occurred on just one day, June 6, when DMRA hosted the annual Detroit Mountain Shakedown mountain biking race. Such large events are undoubtedly important and bring many visitors to the area but also skew estimates for what the "average" day looks like. Throughout this report, we include the Shakedown traffic when discussing overall traffic but generally exclude it when analyzing daily and hourly traffic averages.

Figure 3

Estimated summer traffic flows at DMRA

Average Summer Daily Traffic, excludes special events

Trail Counter Location



Second, the cross-country trailhead does *not* capture visitors who *only* use the downhill gravity trails. DMRA tracks use of the downhill system through lift ticket sales, though it's unknown how many visitors only use the downhill trails on their visit. The number is potentially significant, however, especially on weekends when the lifts are operating. As such, our estimates for the cross-country trail system represent only a share of DMRA's mountain biking use.

The West Side trails receive significant use

The West Side trails — which were developed thanks to a Legacy grant awarded in 2018 — are DMRA's newest trails and receive a significant portion of the cross-country trail traffic. Overall, the West Side trails received 7,118 "visits" during the summer of 2021.[3] Of all visitors who use the cross-country trail system (i.e., those who exit at the trailhead), an estimated 71% of them use the West Side trails at some point during their visit.

Weekends account for 46% of trail use

On average, weekends are 2.1 times busier than weekdays (Figure 4). Saturday is the busiest day of the week (average Saturday daily total traffic = 252) while Tuesdays are the slowest (average Tuesday daily total traffic = 97). Overall, 46% of all DMRA's trail use occurs on weekends.

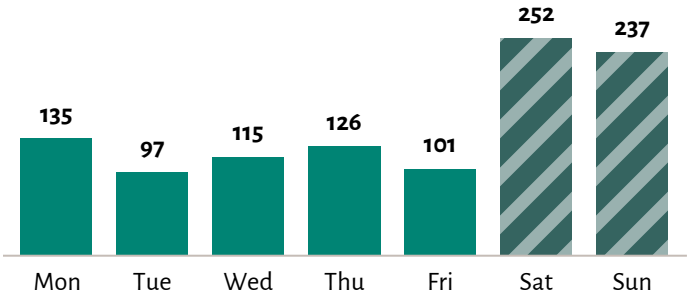
Weekend use peaks in the late morning; Weekday use peaks in the evening.

DMRA's cross-country trails have very different hourly traffic patterns on weekends and weekdays. Weekend traffic is generally slow in the early morning, picks up rapidly starting around 9am, peaks late

Figure 4

Summer day-of-week traffic

Total summer average daily traffic at the cross-country trailhead, excludes special events



2.1
On average, weekends are 2.1 times busier than weekdays

46%
of all trail use **occurs on weekends**

Notes:
Summer is defined as Saturday, May 29, 2021 through Monday, September 6, 2021 (Saturday of Memorial Day weekend through Labor Day).
Excludes the Detroit Mountain Shakedown, a large race that took place on Sunday, June 6.

3 A "visit" in this sense refers to every instance one person "enters" the West Side trail system.

morning, and then tapers off through the afternoon. By dinner time on weekends, few visitors are still on the trail. At the cross-country trailhead, 91% of weekend traffic occurs before 5pm. The vast majority of traffic (81%) occurs between 9am and 4pm. Other count locations show similar weekend patterns, with some variation (Figure 5).

Weekday traffic follows a very different pattern, with peaks in the morning (around 9am) and a larger peak in the early evening (around 6pm). This pattern is indicative of a work schedule, with many visitors coming either before or after work, and is most apparent on the West Side trails.

The weekday pattern is similar at the trailhead, though less pronounced. At the trailhead, there's a similar morning peak in traffic but use remains more steady through the mid afternoon. This might be due to young families visiting and using the Power Up Skills Loop and other beginner trails on the east side trails, but future research would be needed to confirm that hypothesis.

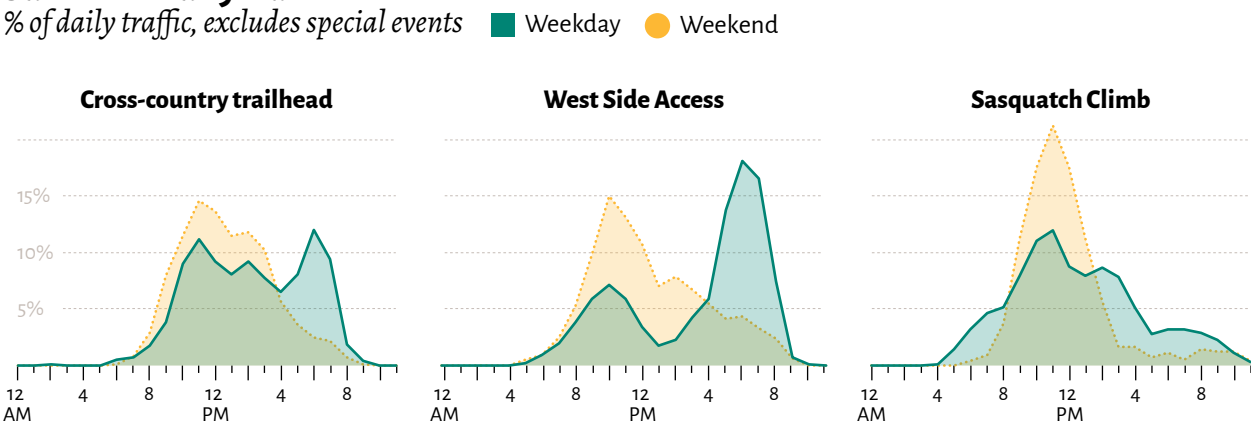
The Sasquatch Climb's weekday traffic is the most unique. Rather than having a morning and evening peak, traffic begins early (5am), peaks late morning, and tapers off into the late evening (10pm). Notably, the Sasquatch Climb receives relatively little use on weekdays (20 total passes, on average), so the behavior of just one or two individuals can have an outsized effect on the overall trend for the location.

Fact sheets summarizing key trail count metrics for each location are available in Appendix A.

Figure 5

Summer hourly traffic

% of daily traffic, excludes special events



Notes:
Summer is defined as Saturday, May 29, 2021 through Monday, September 6, 2021 (Saturday of Memorial Day weekend through Labor Day).

Visitor Demographics

Visitors to DMRA's mountain biking trail system span a wide range of ages

The average *adult* visitor to DMRA is between 40 and 45 years old (median = 44; mean = 42.8; 95% C.I. [40.3, 45.1]). Amongst all adult visitors, the majority (55%) are in their 40s or 50s.

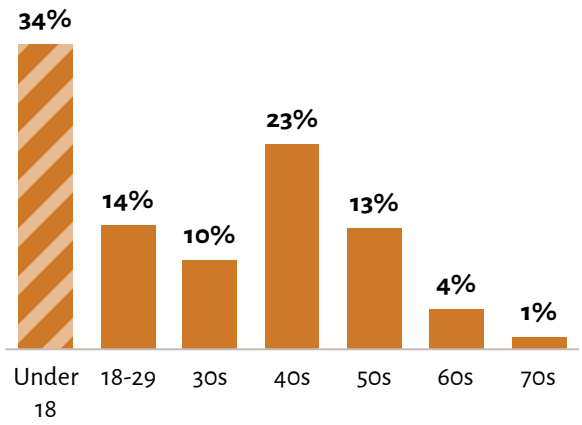
The average age of *all* visitors, however, is significantly younger. The survey did not directly ask for the ages of children visitors (under 18), but it did ask how many children were in each visitor group. Overall, 34% of all visitors were children under 18 (Figure 6). If it's assumed the average age of children visitors is 12, the average age of *all* visitors was approximately 32 years old.[1]

Generations provide another method of understanding visitors by looking at their place in life, whether a young adult, middle-aged or retired. Looking at generations is informative because it provides a way to understand how different formative experiences (e.g., world events, technological advances) interact with visitors' life stage to form recreational preferences. Nearly half of DMRA visitors (43%) during summer 2021 were members of Generation Z or younger,[2] compared to

Figure 6

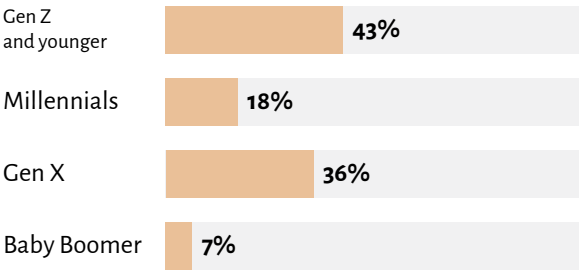
Visitors by age

% of all visitors



Visitors by generation

% of all visitors



Q22: What year were you born? (n = 107)

Notes: Ages were only asked of adult visitors. Percentage under 18 is calculated based upon group composition (Q11). Generations are defined as Gen Z and younger (born 1997 or after; Age 24 and younger), Millennials (born 1981-96; Age 25-40), Gen X (born 1965-80; Age 41-56), and Baby Boomer (born 1946-64; Age 57-75).

1 The Loppet Foundation, a large organization that serves youth in Minneapolis, offers mountain biking camps for kids starting at age 7. Assuming a normal distribution of ages between 7 and 17, children on the trail have an average age of 12.
2 Generation Z is usually defined as people born between 1997 and 2012 (currently ages 9 through 24). This report groups Generation Z together with the upcoming generation (those born 2013 to present).

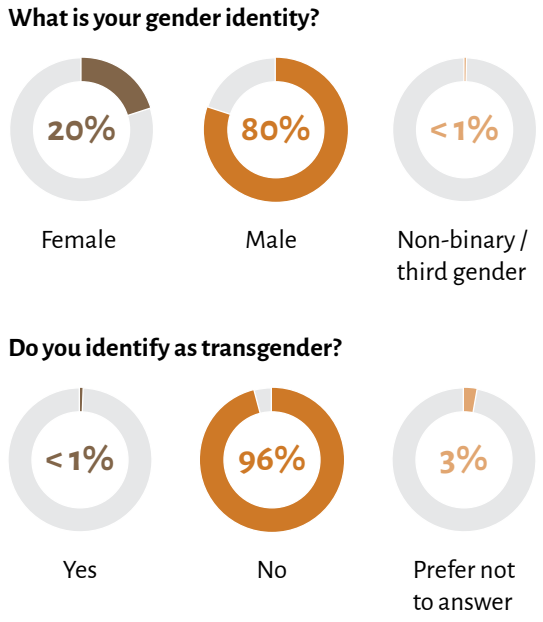
only 32% of Minnesota's general population.[3] After Gen Z, Generation X (ages 41-56) makes up the next largest share of visitors (36%) (Figure 6). This is presumably because Gen Xers are the parents of Gen Zers: 53% of Gen Xers were visiting with children, compared to 36% of Baby Boomers and just 17% of Millennials ($p < .05$).

After Gen Xers, Millennials (age 25-40) are the next largest cohort amongst visitors (18% of visitors). Only 7% of visitors were Baby Boomers. Overall, the age breakdown of visitors speaks well of DMRA's ability to attract families.

Figure 7

Visitors by gender identity

% of adult visitors



Q23. What is your gender identity? (n = 112)
Q24. Do you identify as transgender? (n = 106)

Males account for a significant majority of visitors to DMRA's mountain biking trails

Visitors to DMRA's mountain biking trails are predominately male. Four-fifths (80%) of adult visitors identified as male, compared to only 20% of visitors who identified as female. Fewer than 1% of visitors identified as either non-binary or a third gender.

A small minority (fewer than 1%) of visitors identified as transgender. The majority of visitors (96%) do not identify as transgender, while 3% of visitors preferred not to answer (Figure 7).

The majority of visitors are white , highly-educated, and high-income

A significant majority of visitors (90%) identified as white (Figure 8). Approximately 3% of visitors identified as Native American, while 2% identified as Hispanic or Latinx, 2% identified as Middle Eastern or North African, and 2% identified as "some other race, ethnicity or origin." Approximately 1% of visitors identified as Asian and another 1% identified as Black or African American.

Visitors to DMRA's mountain biking trails have disproportionately high incomes compared to the statewide average. Over half of visitors (61%) reported annual household incomes of $100,000 or higher (Figure 9). For comparison, only 35% of Minnesota households make over $100,000

3 U.S. Census Bureau. Population Division. 2020

annually.[4] Correspondingly, visitors are also less likely to have below-average incomes. Whereas 32% of Minnesota households make less than $50,000 annually, only 13% of DMRA visitors do.

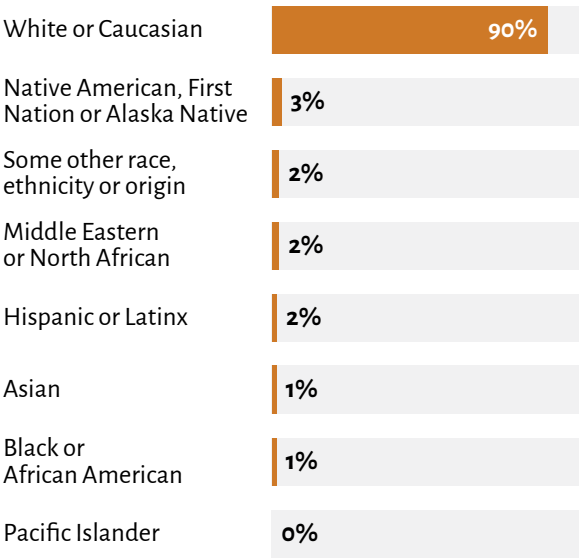
Visitors are also highly-educated compared to the Minnesota average. A majority (62%) of visitors had either a graduate degree or a bachelor's degree (Figure 10). For comparison, only 36% of Minnesotans over the age of 25 have a college degree.[5]

A minority (7%) of visitors reported having a physical, mental or sensory disability or condition. That's significantly lower than the statewide average (22% of

Figure 8

Visitors by race/ethnicity

% of adult visitors

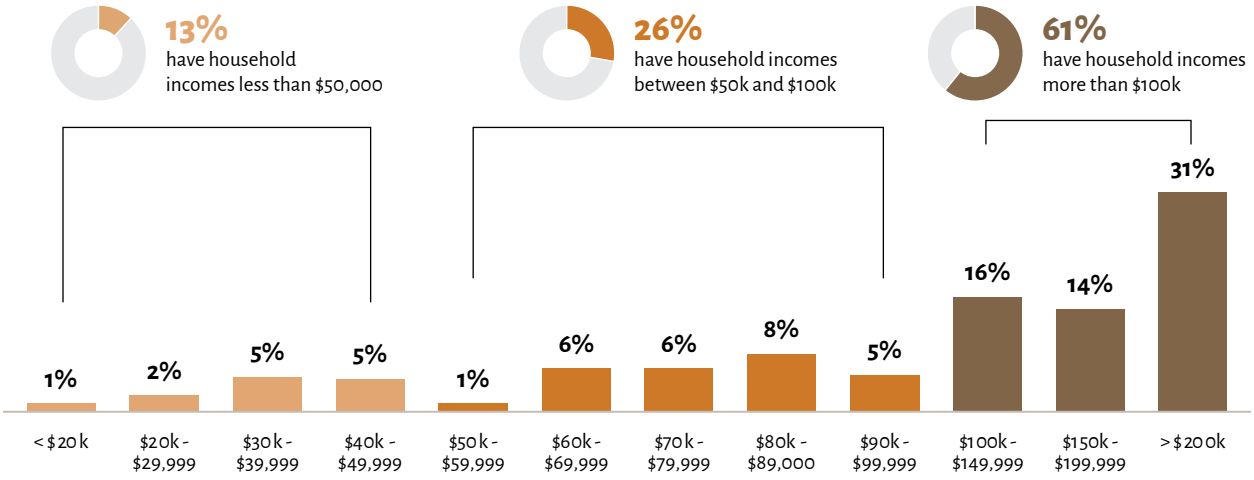


Q25. How do you describe yourself? *Select all that apply* (n = 112)

Figure 9

Visitors by annual household income

% of adult visitors



Q31. Please indicate your total household income before taxes last year (n = 99)

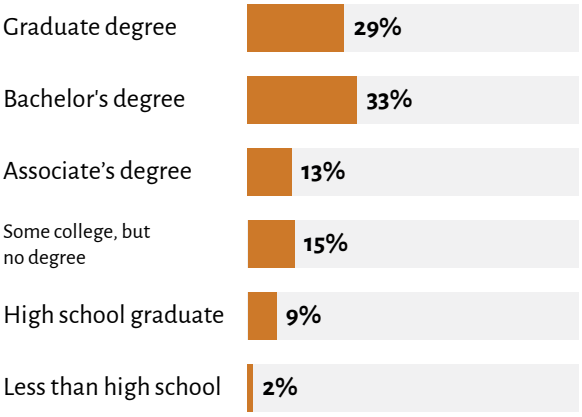
4 U.S. Census Bureau, 2019 estimate.
5 U.S. Census Bureau, 2015-2019 estimate.

Minnesotans have a disability).[6] To our knowledge this is the first year a question about disabilities has been asked on visitor surveys at any state or regional park or trail. Future research will be needed to better understand park and trail visitors with disabilities and if/how parks and trails can better serve communities of all abilities.

Figure 10

Visitors by educational attainment

% of adult visitors



Q29: What is the highest level of education you have completed? (n = 108)

Figure 11

Visitors with disabilities

7%

of visitors have a **physical, mental or sensory disability or condition**

Q30. Do you, or does someone in your group, have a physical, mental or sensory disability or condition? (n = 106)

6 Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Questionnaire. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2019.

Trail Experience

Nearly all visitors use the trails primarily for mountain biking

The vast majority (93%) of DMRA's summer visitors are mountain biking. This is not surprising, of course, as the trails are designed and marketed primarily for mountain biking. The trails *are* used for other activities however: 11% of visitors go hiking or walking on the trails, 5% go dog walking, 4% do nature photography, 3% go birding or wildlife watching, and 2% go running or jogging (Figure 12).

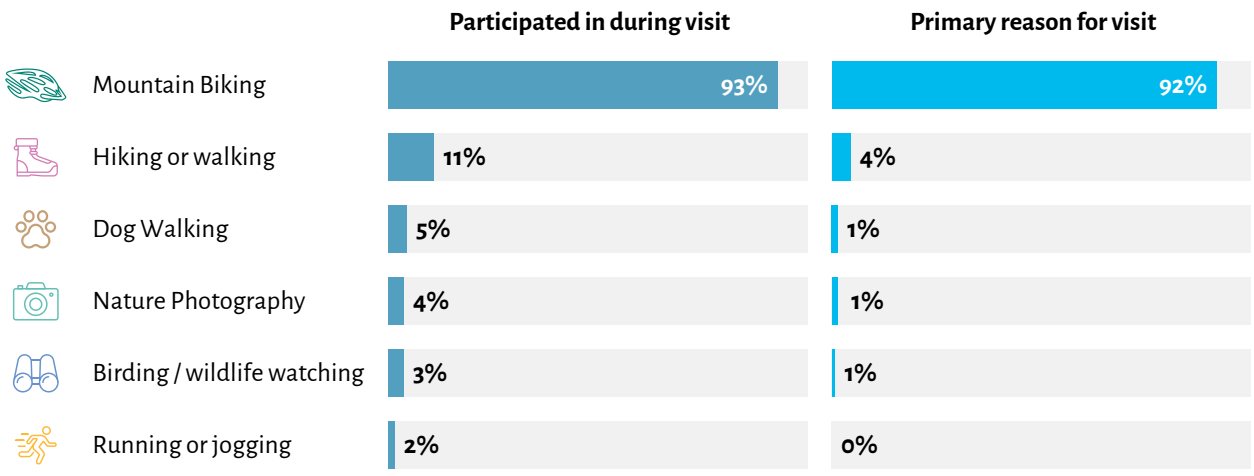
A relatively high number of visitors (10%) reported participating in multiple activities during the same visit. This is partly due to some activities being complementary (e.g., it's possible for someone to go mountain biking and take nature photos on the same trip). Some visitor groups are also comprised of people doing different activities (e.g., a parent hikes while their children ride). And finally, it's possible some mountain bikers also selected "hiking or walking" partly in jest, indicating they got tired and had to walk part of the way.

Overall, mountain biking was the primary activity for nearly all visitors (92%), whereas only 4% of visitors use the trails primarily for hiking. Visitors who are primarily dog walking, doing nature photography and

Figure 12

Participation in trail activities during visit

% of all visitors

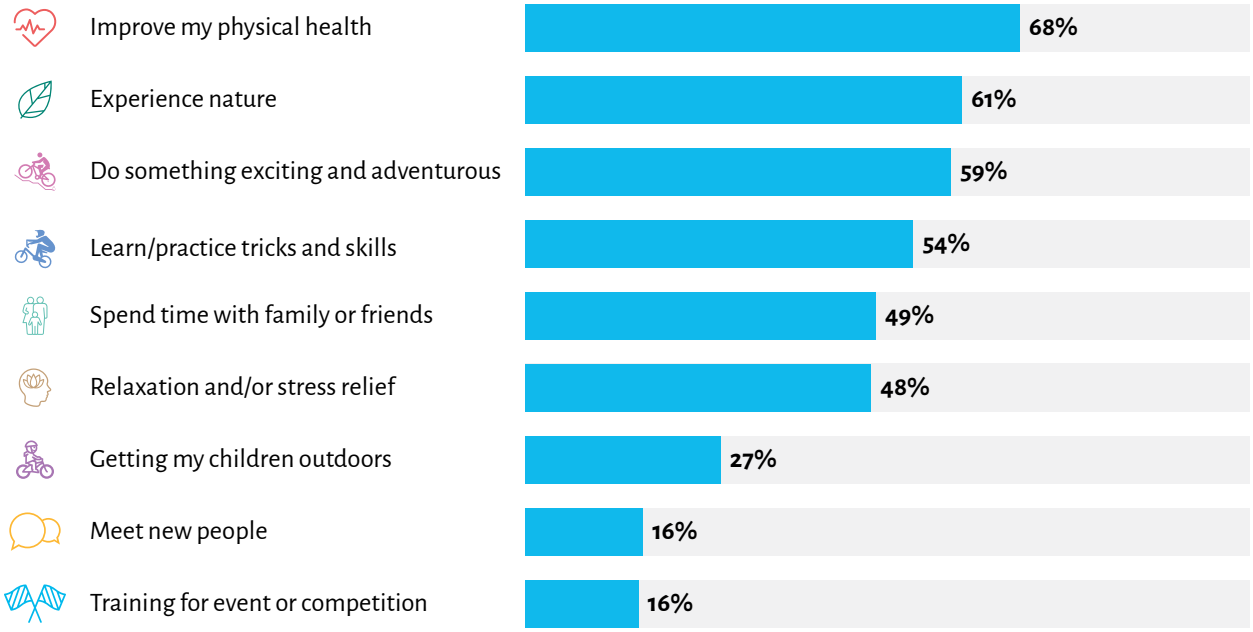


Q1. Which trail activities are you and your group doing during your visit today? *Select all that apply* [Answers presented in randomized order] (n = 116)
Q2. Which one of these activities was your main reason for visiting this trail? (n = 116)

Figure 13

Most important reasons for visiting the trail

% of adult visitors



Q7. What are your most important reasons for visiting the trail today? *Select all that apply* [Answers presented in randomized order] (n = 116)

running/jogging combine to account for approximately 3% of all visitors.

Physical exercise and nature top the list of motivations for visiting

Visitors to DMRA's mountain biking trail's are most often visiting to improve their physical health. Over two-thirds of visitors (68%) say improving their physical health was one of their most important reasons for visiting. Other frequently cited reasons for visiting include experiencing nature (61% of visitors), doing something exciting or adventurous (59%), learning or practicing tricks and skills (54%), spending time with family or friends (49%) and relaxation and/or stress relief (48%) (Figure 13).Other reasons for visiting were generally less important to visitors. Only 16% of visitors say they visit DMRA to meet new people and/or train for an event or competition.

"Getting my children outdoors" was also a relatively infrequent reason for visiting. Approximately a quarter of visitors (27%) said getting their children outdoors was an important reason for visiting, even though 40% were visiting with children. Among visitors visiting with children, improving physical health (72%), spending time with family and friends (69%), experiencing nature (64%), getting children outdoors (64%) and practicing tricks or skills (60%)

were all similarly common reasons for visiting. Compared to visitors visiting without children, visitors with children were more likely to say spending time with friends and family was an important reason for their visit (69% vs. 35%, $p < .001$) and — perhaps surprisingly — more likely to be training for an event or competition (28% vs. 7%, $p < .05$). That groups with children were more were more likely to be training for events is likely due to DMRA hosting a number of youth races.

Motivations for visiting differed across visitor subgroups. First-time visitors, for example, were more likely to say experiencing nature (76% vs 55%, $p < .05$), relaxation and/or stress relief (62% vs. 43%, $p < .10$), and doing something exciting and adventurous (72% vs. 55%, $p < .10$) were important reasons for their visit.

Locals and tourists also expressed different motivations for visiting. Compared to locals, tourists were more likely to say relaxation and/or stress relief (54% vs. 35%, $p < .10$), spending time with friends and family (57% vs. 32%, $p < .05$), doing something exciting and adventurous (70% vs 36%, $p < .01$) and learning or practicing trick and skills (62% vs. 35%, $p < .05$) were important reasons for their visit. Locals, conversely, were more likely to say experiencing nature was an important reason for their visit (73% vs. 54%, $p < .10$).

Motivations also varied with age. "Younger" visitors (Gen Z and Millennials) were more likely to say doing something exciting and adventurous (72% vs. 53%, $p < .10$) and practicing tricks and skills (65% vs. 49%, $p < .10$) were important reasons for their visit. "Older" visitors (Gen X and Baby Boomers) were more likely to say experiencing nature (68% vs. 51%, $p < .10$) and meeting new people (22% vs. 8%, $p < .10$) were important reasons for their visit.

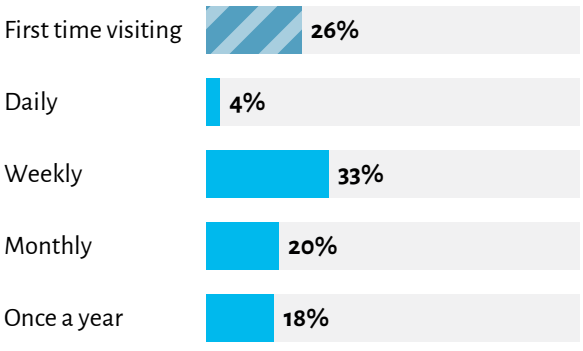
Over half of visitors are "regulars"

Over half of visitors (57%) are "regulars," meaning they visit at least once a month. The largest share of visitors report visiting weekly (33%), while another 20% of visitors report visiting monthly. Only a small share of visitors (4%) say they visit every day. A significant minority of visitors — approximately a quarter (26%) — were visiting DMRA for the first time. Conversely,

Figure 14

Visitation frequency

% of adult visitors



Q9. Approximately how often do you visit this trail during spring, summer and fall? (n = 113)

18% of visitors say they visit DMRA about once a year (Figure 14).

Most visitors spend anywhere from 1 to 3 hours on the trail each visit

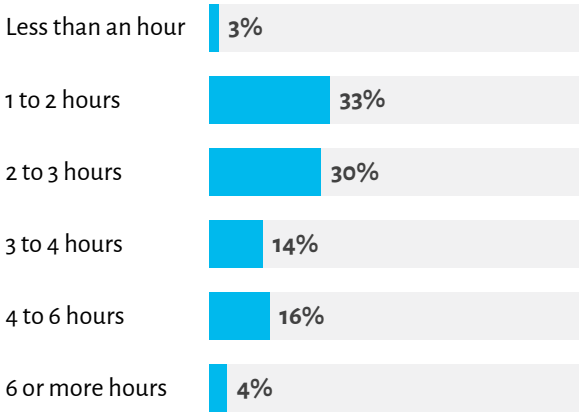
On average, visitors spend approximately 2 hours, 10 minutes on the trail per visit (median = 2.2, mean = 2.5, 95% C.I. [2.3, 2.8]). Overall, however, there's broad diversity in how long people spend on the trail. The majority of visitors spent between 1 and 3 hours on the trail: 33% of visitors spent between 1 and 2 hours and 30% spent between 2 and 3 hours (Figure 15). Many visitors spend even longer on the trail: Nearly a third of visitors (30%) spent between 3 and 6 hours at DMRA. Only a small number of visitors fall on the extremes: 3% of visitors spent less than an hour, and only 4% spent 6 hours or more.

Figure 15

Duration of trail visit

The average visitor spends
2 hours, 10 minutes
at the trail

% of all visitors spending _____ at the trail



Q8. Approximately how much time did you spend at the trail on this visit? [Hours: Minutes] (n = 113)

Photo credit: Detroit Mountain Recreation Area

During the weekends, when the lifts are running, visitors tend to stay longer. Weekend visitors, on average, spent an extra hour on the trail compared to weekday visitors (mean = 3.1 vs. 2.1, $p < .01$).

The majority of visitor groups are pairs or individuals recreating alone

Most visitors (71%) visit DMRA's mountain biking trail system with other people (Figure 16). Most groups are relatively small, however: nearly half of visitors (44%) visit with one or two other people, whereas only 28% of groups are 4 people or larger. Nearly one-third of visitors (29%) visit alone.

The average (mean) visitor group size is 3.6 people (95% C.I. [2.8, 4.4]). Approximately two-fifths of visitor groups (40%) include children, and such groups tend to be larger than groups without children. The average group with children had 5.8 people, nearly three times the size of the average group without children (2.2, $p < 0.001$).

Visitor groups tend to be smaller on weekends than they are on weekdays. On weekends, the average group has 2.6 people, compared to an average of 4.5 people on weekdays ($p < .05$).

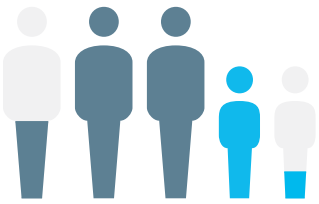
Visitors give DMRA's mountain biking trail system very high ratings

Visitors rated their experiences at DMRA very highly (Figure 17). Nearly all visitors (80%) said their experience was "very good", and the other 20% rated it as "good." No survey respondents visitors rated their experience as "fair", "poor" or "very poor".

Few significant differences in trail ratings were observed across visitor subgroups. Regardless if visitors were men or women; had children with them or not; were first-time or repeat visitors; were tourists or

Figure 16

Group size and composition



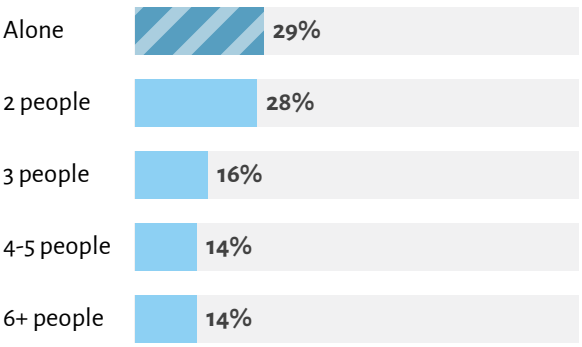
Average group:

3.6 Total people

2.4 Adults

1.2 Children

% of all visitor groups



40%

of groups include children under 18 years of age

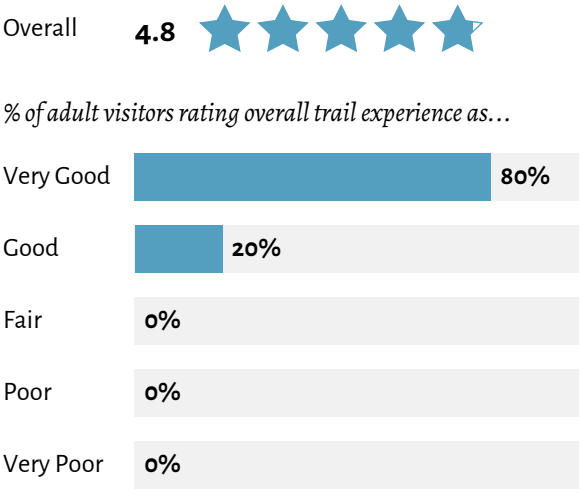
Q11. How many people are in the group you're recreating with today? [Adults 18 years and older, including yourself; Children under 18] (n = 113)

locals; were young or old; or were beginner, intermediate, advanced or an expert riders, all subgroups we analyzed gave the trails similarly high ratings. This speaks well of the trail system as a whole and its ability to appeal to a wide range of visitors.

One notable exception is that visitors on weekdays gave the trails significantly higher ratings than weekend visitors. Nearly all visitors (91%) surveyed on weekdays said their experience was "very good," compared to only 69% of visitors on weekends ($p < .05$). Future research would be needed to understand why visitors' experiences tend to be better on weekdays than weekends.

Figure 17

Visitor ratings of trail experience



Q10. Overall, how would you rate your trail experience today? (n = 111)

Note: Overall rating based on scale where 5 = very good, 4 = good, 3 = fair, 2 = poor, and 1 = very poor

Rider Characteristics

Nearly all mountain bikers are riding their own bike

Nearly all adult riders (88%) on DMRA's trails were riding their own bike (Figure 18). If not riding their own bike, visitors were most likely using a rental bike (11% of all visitors). Approximately one tenth of riders (11%) were using a fat-tire bike.

Half of riders on DMRA's trails have intermediate skills

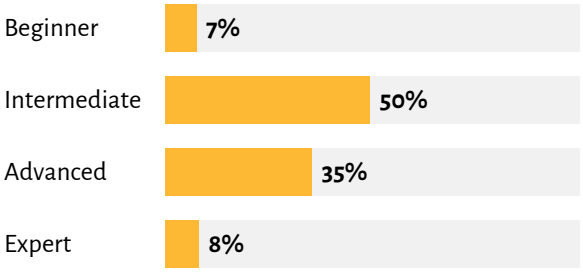
Approximately half of DMRA's riders (50%) say their mountain biking skill level is intermediate. Another third of adult visitors (35%) say they have advanced riding skills (Figure 19). Relatively few visitors were beginners (7%) or expert riders (8%).

Visitors with differing mountain biking skill levels often visit DMRA for different reasons. Beginner and intermediate riders, for example, are more likely to visit in order to spend time with friends and family, to get their children outdoors and to do something exciting and adventurous. Advanced and expert riders, conversely, are more likely to visit in order to train for an event or competition. Advanced and expert

Figure 19

Mountain biking skill level

% of adult visitors, mountain bikers only

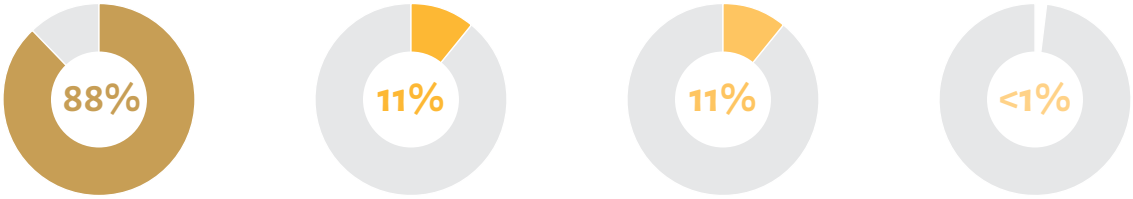


Q4. What is your mountain biking skill level? (n = 107)

Figure 18

Bike characteristics

% of adult visitors, mountain bikers only



Q5. Are you riding a fat-tire bike today? (n = 106)
Q6. Are you riding your own bike today? (n = 107)

riders were also more likely to be frequent visitors (52% of advanced/expert riders visit weekly, compared to only 25% of beginner/intermediate riders, $p < .05$).

Across most other measures, however, visitors are similar across skill levels. Visitors' gender, age, income, education, trail rating, trip duration, group size, and origin (tourist vs. local) were all similar across beginner, intermediate, advanced and expert skill levels. [1]

Mountain bikers on DMRA's trails have a wide variety of favorite places to ride

Understanding where visitors' favorite place to ride provides an interesting snapshot of the top mountain biking facilities in Minnesota, and also provides a sense of comparable trail systems that have a similar visitor base as DMRA. Most visitors (47%) said DMRA was their favorite place in Minnesota to go mountain biking.

Beyond DMRA, a wide variety of places were listed (Figure 20): Cuyuna (identified by 36% of visitors) and Redhead (7%) topped the list, followed by various trails in the Twin Cities Metro (3%), Maplelag (3%) and Duluth (2%). Giant's Ridge and Movil Maze also received mentions.

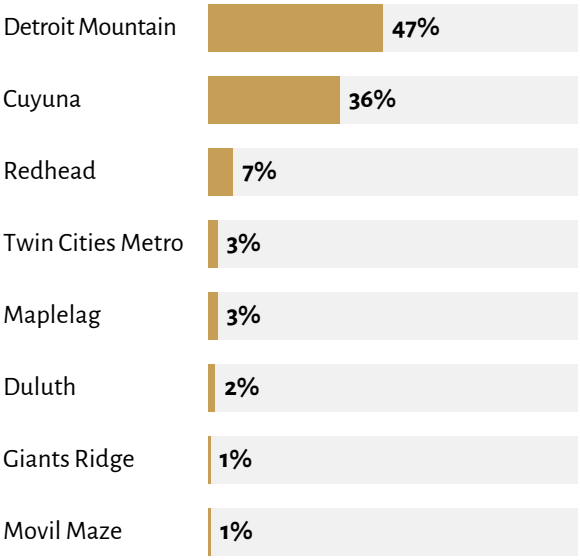
Figure 20

Favorite places to mountain bike

62%

of visitors have a **favorite place in Minnesota to go mountain biking**

% of visitors who say _____ is their favorite place to go mountain biking in Minnesota…



Q3. Do you have a favorite place in Minnesota to go mountain biking? (n = 107)
Q3a. If so, where? [Open ended response] (n = 62)

1 Skill levels on the survey were self reported, and the survey did not provide skill level definitions or descriptions. As such, results are based on each respondent's perception of their skills and their perception of what each skill level entails. Results should be interpreted with this caveat in mind.

Trail Tourism

The majority of summer visitors to DMRA are tourists

Approximately two-thirds of DMRA visitors (67%) are tourists, defined as someone who is 50 miles or more away from home and/or staying at least one night away home (Figure 21). The majority of visitors are overnight visitors (42%), while 25% of visitors are on day trips. Local visitors account for approximately one third (33%) of visitors.

Demographically, tourists and locals are similar. Tourists and locals are equally likely to visit with children, recreate in similarly sized groups, are of similar ages and earn similar incomes. Tourists and locals also report having similar skill levels and give DMRA similar ratings. There are some notable differences, however. Tourists and locals tend to have different motivations for visiting (see the "Trail Experiences" section), and tourists tend to spend longer on the trail (2.8 hours vs. 2 hours, $p < .05$).

Visitors to DMRA's mountain biking trail system come from all over the country

DMRA's mountain biking trails hosts visitors from all over the country: 14 different states (plus one territory) were represented among survey respondents (Figure 22). Visitors came from as far away as California, Connecticut and the U.S. Virgin Islands.

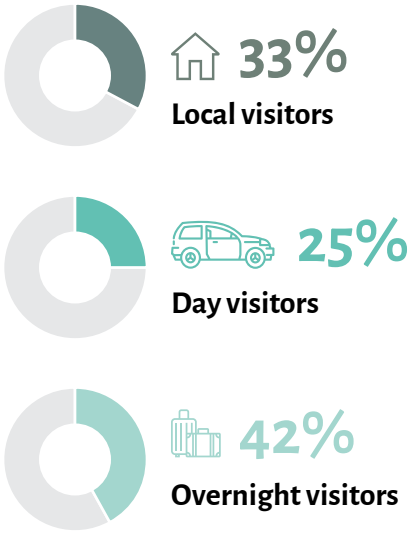
While visitors arrived from both coasts, the vast majority of visitors are from Minnesota and North Dakota. A small majority (51%) of visitors were from Minnesota and 33% were from North Dakota.

Notably, the COVID-19 pandemic severely restricted international travel during the 2021 summer season. Consequently, every visitor surveyed was from the United States. DMRA is approximately 4 hours away from

Figure 21

Visitor travel segments

% of all visitors



Q15. Do you live more than 50 miles from this trail? (n = 114)
Q16. Are you on a trip where you have or plan to stay at least one night away from home? (n = 114)

Note: "Local Visitor" defined as someone who lives within 50 miles and is not spending a night away from home. "Day Visitor" is someone who lives more than 50 miles away but is not spending a night away from home. "Overnight visitor" is someone spending at least one night away from home, regardless of how far away they live.

the Winnipeg metropolitan area (compared to 3 hours away from the Twin Cities) and, had the northern border been open, it's likely a significant number of Canadians would have visited. As such, our 2021 data likely underestimates the full extent that DMRA's trails serve out-of-town visitors during "normal" years.

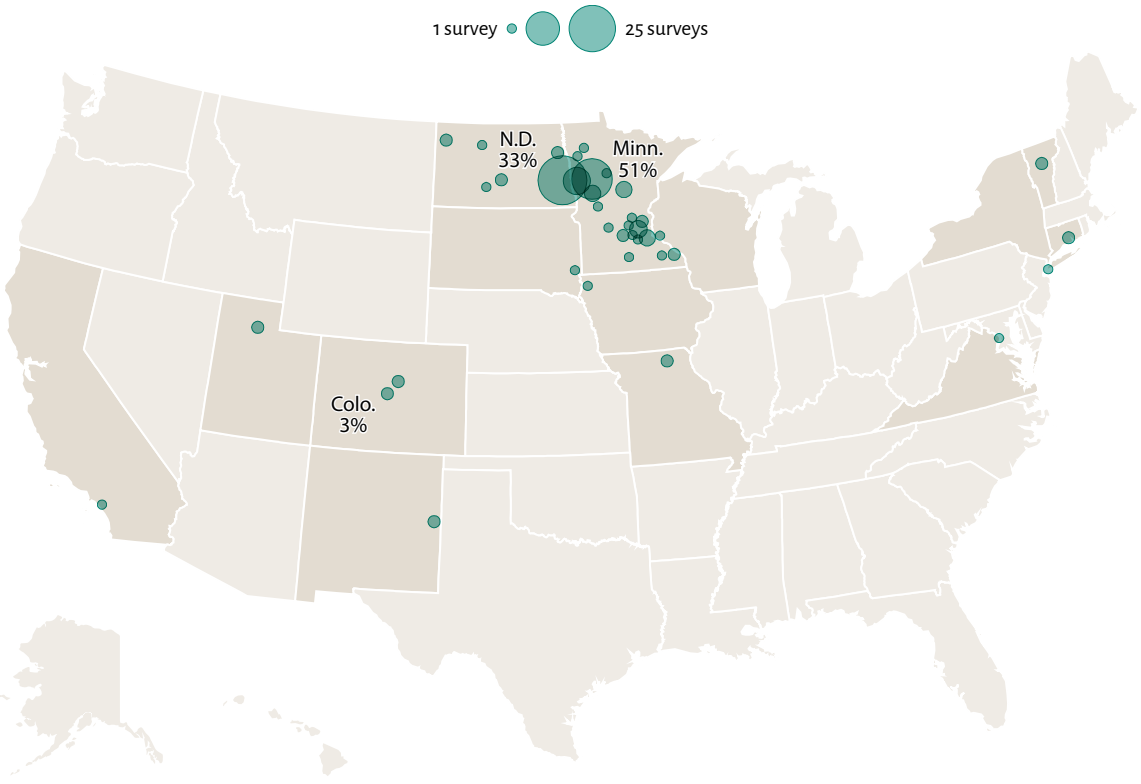
Fargo-Moorhead is DMRA's primary tourism market

One third of visitors (34%) to DMRA's mountain biking trail system were from the Fargo-Moorhead metropolitan area (Figure 23). After Fargo-Moorhead, the next largest visitor markets are Detroit Lakes region itself (18% of all visitors) and the Twin Cities metropolitan area (12% of all visitors).

Not surprisingly, day tourists and overnight tourists tend to be from different places. The majority of visitors from Fargo-Moorhead were day trippers (though 18% stayed in the Detroit Lakes area overnight), and consequently Fargo-Moorhead accounted for the majority of day trips (72%). The Grand Forks area was the second most frequent origin for day trips (7%). The Twin

Figure 22

Where visitors are from: National map



21. What is the zip code of your home address, or what is your country of residence? (n = 111)

Cities accounted for the largest share of overnight visitors (22%), and every survey respondent from the Twin Cities area spent at least one night in the Detroit Lakes area.

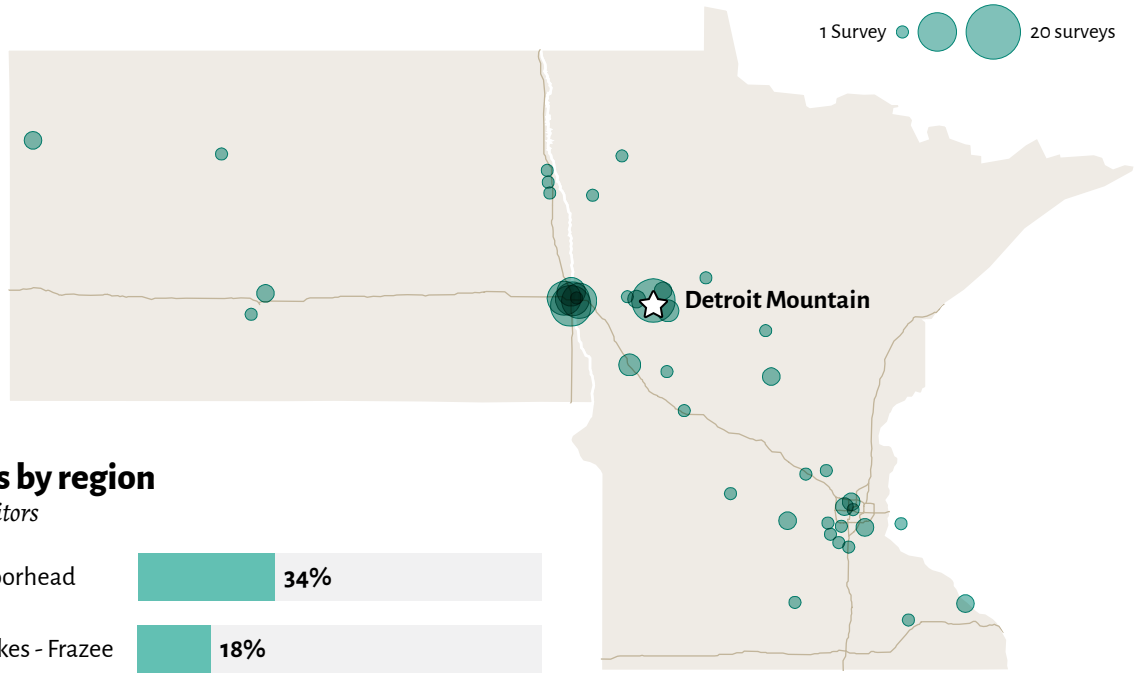
The majority of overnight visitors stay in private homes or cabins

Detroit Lakes is in the heart of Minnesota's cabin country, and the majority of overnight visitors to DMRA stay in private homes or cabins. Approximately two-thirds of overnight visitors reported staying in private residences, either at the home or cabin of a friend or family member (41%) or their own personal cabin (27%) (Figure 24).

Fewer, though still significant, numbers of overnight visitors stay in commercial accommodations. Nearly one fifth of overnight guests (19%) stayed in a hotel or motel, while 11% stayed at a campground and 11% stayed at a resort or lodge. Very

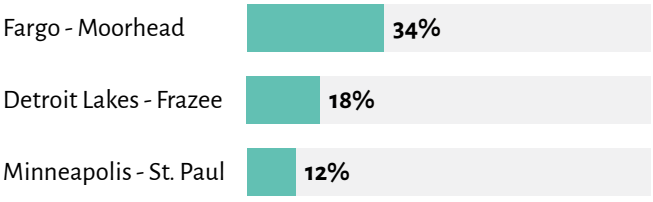
Figure 23

Where visitors are from: Regional map



Visitors by region

% of all visitors



21. What is the zip code of your home address, or what is your country of residence? (n = 111)

few visitors reported staying at a Bed and Breakfast (2%) or a vacation rental by owner (e.g., Airbnb, VRBO; 1%).[1]

Overnight trips tend to be 1 or 2 nights... or a week or two

The amount of time overnight visitors spend in the Detroit Lakes is also indicative of DMRA being in cabin country. The majority of overnight visitors tend to spend either one to two nights in the area (44%; presumably on weekend trips) or spend longer than a week (32% of overnight visitors) (Figure 24). Relatively few overnight visitors (22%) spend between 3 and 6 nights in the area.

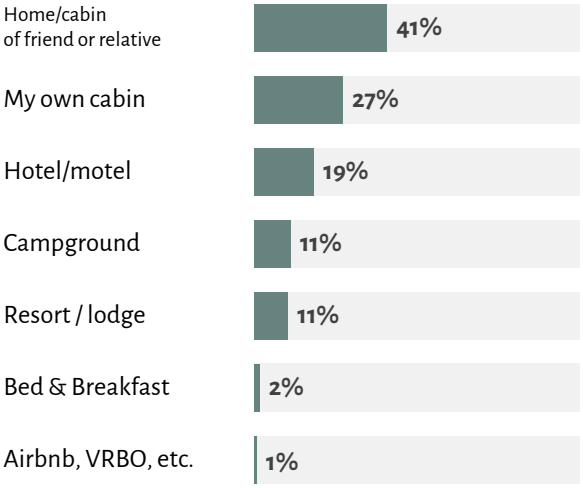
DMRA is the primary reason Day Trippers visit the area, less important for overnight visitors

There's all kinds of reasons tourists choose to visit different areas. Some tourists visit for a specific reason (e.g., to ride the trail everybody's talking about), others visit for a complex mix of reasons (e.g. the area has great food, stunning scenery and lots of activity options to choose from) and others visit for completely unrelated reasons (e.g., they're spending a week at the family cabin). Understanding whether tourists at DMRA are visiting the area primarily for the trails themselves, or if they see the trails as just one of many attractions in the area, is helpful for tourism marketing and planning.

Figure 24

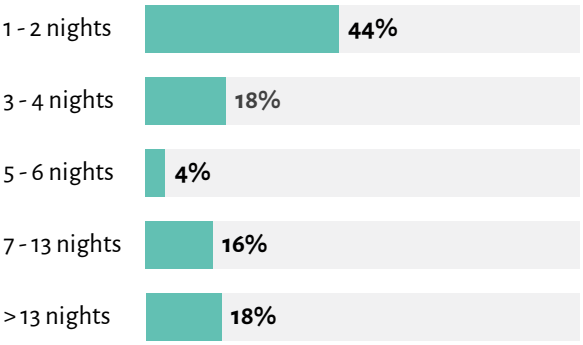
Visitor overnight accommodations

% of overnight visitors



Trip Length

% of overnight visitors



Q18. How many total nights do you plan to spend in this area during your trip? (n = 45)
Q19. What type of overnight accommodations are you staying in during your trip? *Select all that apply*
[Answers presented in randomized order] (n = 53)

For tourists visiting DMRA, the trails themselves are usually at least part of the reason for their trip (Figure 25). Among all

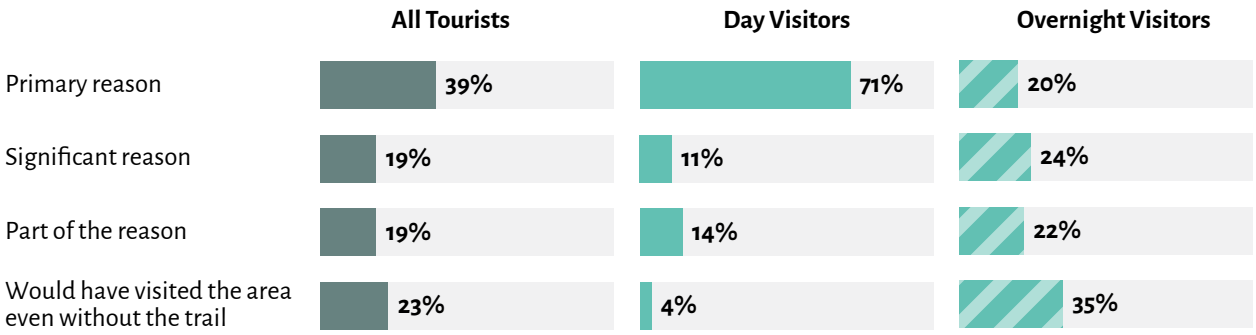
1 Percentages for overnight accommodations add up to over 100% because some visitors stay in multiple types of accommodations during their stay

tourists, 39% said the trail was the primary reason they visited the area, and another 19% said the trail was a significant reason. Only 23% of tourists said they would have visited the Detroit Lakes area regardless of the mountain biking trails. Day tourists, unsurprisingly, are significantly more likely to say the trails were the primary reason for their visit than overnight visitors. The majority of day visitors (71%) said the trail was the primary reason for their visit, compared to only 20% of overnight visitors.

Figure 25

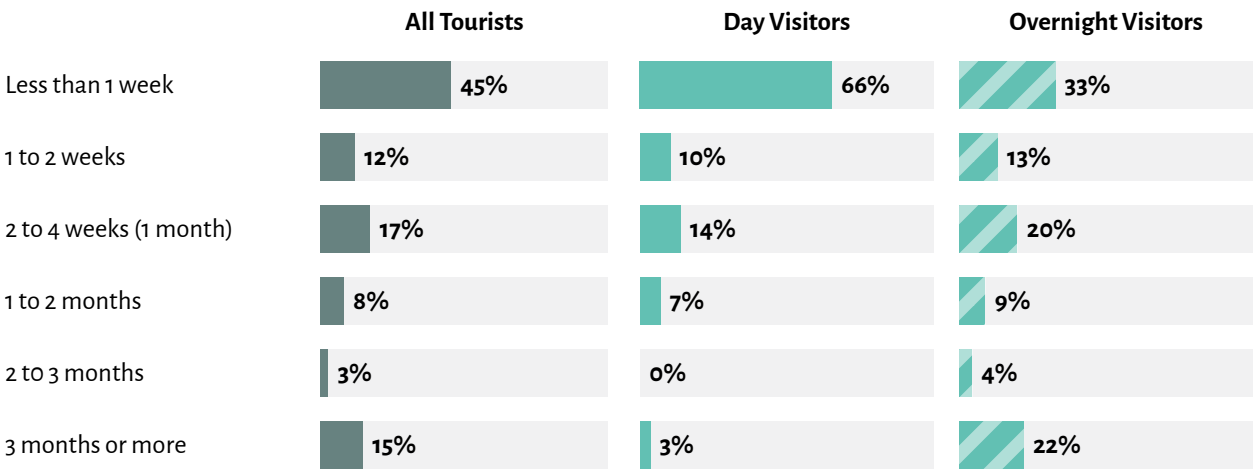
Importance of trail in decision to visit the Detroit Lakes area

% of adult visitors, tourist visitors only



How far in advance tourists planned their trip

% of adult visitors, tourist visitors only



Q17. How important was the trail in deciding to visit this area? (n = 74)
Q20. How far in advance did you plan this trip? (n = 75)

Note: "Tourist" defined as visitor who lives more than 50 miles away and/or is spending a night away from home. "Day Visitor" is someone who lives more than 50 miles away but is not spending a night away from home. "Overnight visitor" is someone spending at least one night away from home, regardless of how far away they live.

But even though overnight visitors have more nuanced reasons for visiting the Detroit Lakes area, DMRA was a significant factor for most of them. Nearly half of overnight visitors (44%) said the trail was a significant (or primary) reason for their visit. Approximately a third (35%) of overnight visitors said they would have visited the area regardless of the trails, a number that correlates closely with the share of overnight visitors spending a week or more in the area.

There's a wide range in how far in advance tourists plan their visits, though most trips are planned with little notice

Nearly half of tourists on DMRA's trails (45%) planned their trip less than a week in advance. Visitors on day trips were, unsurprisingly, more likely to have made "last minute" plans (66% of day visitors had made plans less than a week advance). Even among overnight visitors, a third of trips (33%) were planned less than a week in advance. The majority of overnight trips (55%), however, were planned 2 weeks or more in advance (Figure 25).

Trip Planning

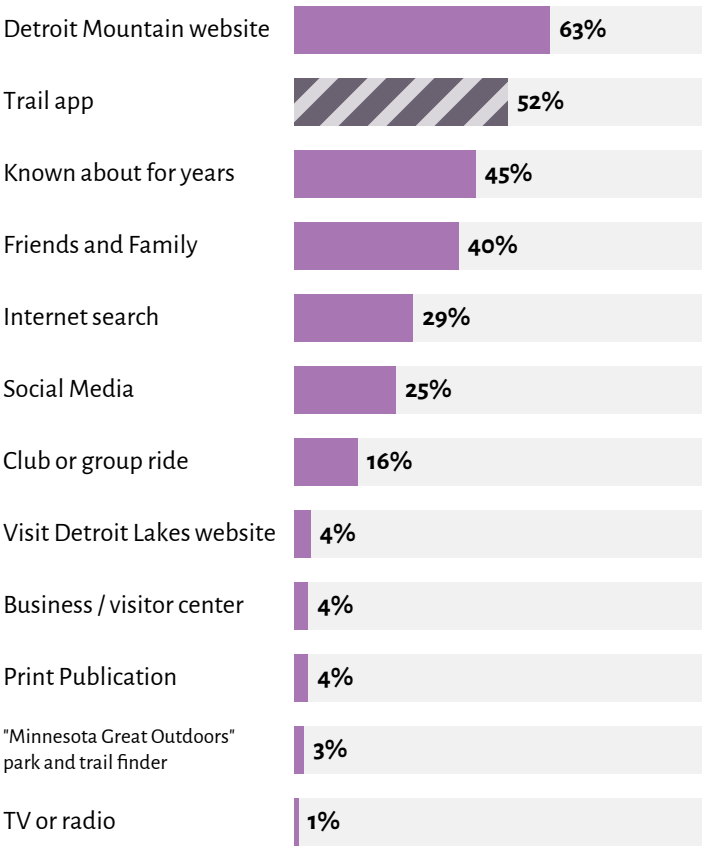
The DMRA website is visitors' primary information source for learning about the mountain biking trails

Nearly two-thirds of visitors (63%) say they use DMRA's website to learn about the trails, with a majority of visitors also using a trail app (Figure 26). No other information source is used by a majority of visitors, though a large minority of visitors say they've known about the trail for years (45%) or have learned about the trails from friends or family (40%). Internet searches (used by 29% of visitors), social media (25%) and club or group rides (16%) round out the top places visitors find information about DMRA's

Figure 26

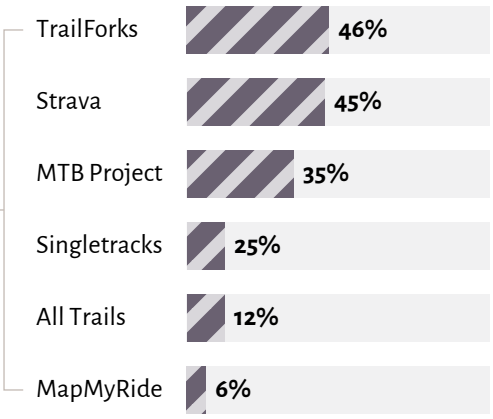
Where visitors get information about the trail

% of adult visitors who use information source



Most popular trail apps

Of trail app users, % who use…



Use of trail apps depends on skill level

% of adults who use trail app

Q12. What information sources have you used to learn about this trail? *Select all that apply* [Answers presented in randomized order] (n = 113)

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

mountain biking trails. Other information sources, such as the Visit Detroit Lakes website, local businesses, print publications, the "Minnesota Get Outdoors" park and trail finder, and TV or radio were used by less than 5% of visitors.

The relatively high use of trail apps should be of interest to trail managers and researchers alike, since trail apps track valuable data that can inform how trail systems are used. Both Trailforks and Strava, for example, provide heat maps of trail use based on data provided by their subscribers. Such trail app data is undoubtedly informative, and our data suggests DMRA visitors who use trail apps are indeed similar to visitors who don't use trail apps across a wide range of measures. Trail app users and non-trail app users are similar ages, are equally likely to be men, are equally likely to be tourists, have similar education and income levels, and spend equal amounts of time on the trail each visit. Some caution, however, should be used when interpreting trail app data. For starters, visitors use a relatively wide range of different trail apps. TrailForks (used by 46% of app users) and Strava (45%) are the most frequently used (Figure 26), though MTB Project (35%) and Singletracks (25%) are used by sizable minorities. Fewer visitors who use trail apps use All Trails (12%) or MapMyRide (6%).[1] Consequently, data from any one trail app is only capturing (at most) a quarter of all users (i.e., half of visitors use trail apps, and the most popular trail apps are used by approximately half of trail users).

Second, trail app users are not representative of all visitors across all measures. For example, visitors who use trail apps tend to have higher skill levels than visitors who don't use apps (Figure 26). Compared to the average trail visitor, trail app users are also more likely to be training for an event or competition, more likely to be visiting in order to meet new people, and tend to recreate in larger groups. Data from trail apps should be interpreted with this context in mind.

Locals and tourists generally get their information about the trails from similar sources

By and large, DMRA visitors tend to get their information about the trails from similar sources regardless if they are locals or tourists. Perhaps surprisingly, tourists were *more* likely to learn about DMRA's mountain biking trails through word of mouth (46% of tourists said they had learned about the trails from friends and family, compared to only 30% of locals, $p < .05$). But otherwise, tourists and local visitors were equally likely to use the DMRA's website, trail apps, Internet searches, social media, and club or group rides to learn about the

1 The percentages don't add up to 100% because many trail app users report using more than one app.

trails (Figure 27). Locals and tourists were also equally unlikely to use Visit Detroit Lakes website and recommendations from local businesses.

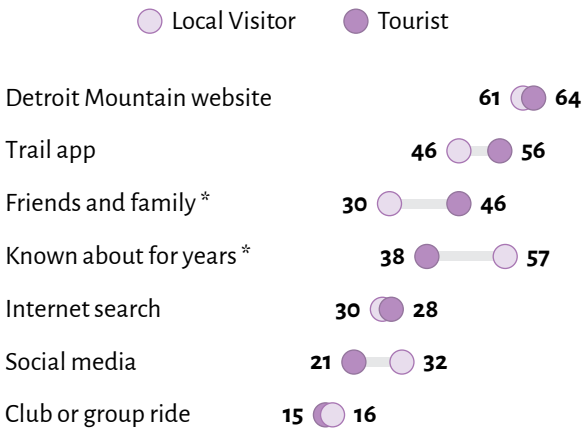
Less than half of visitors look for information about the trail before their visit

Just as tourists and local visitors tend to use similar information sources to learn about DMRA, they are also equally unlikely to look to information about the trails before visiting. Only 39% of visitors said they looked for information about DMRA's trails before visiting. The overall low frequency in which visitors look for information before their trip is likely due to the majority of visitors being repeat visitors. First-time visitors are indeed more likely to look for information before their visit: 69% of first-time visitors looked for information prior to visiting, compared to only 30% of repeat visitors ($p < .01$). But even among first-time visitors, the share who say they looked for information is surprisingly low. If the data is taken at face value, 31% of first-time visitors visit DMRA without first looking up any information about it. This number may be biased by how the question was asked. Visitors were asked, "To prepare for your visit today, did you or your group look for information about this trail before you came?" Survey respondents perhaps took the question very literally, and answered "yes" only if they had looked for information about the trail on the same day as their visit.

Figure 27

Local and tourist use of selected information sources

% of visitors using information source



Q12. What information sources have you used to learn about this trail? *Select all that apply* [Answers presented in randomized order] (n = 114)

**** p < 0.01, ** p < 0.05, * p < 0.10.*

Additionally, no statistically significant differences were found in locals and tourist use of the Visit Detroit Lakes website, the "Minnesota Great Outdoors" park and trail finder, recommendations from businesses, print publications or TV or radio.

When visitors look for information, they're most often looking for trail maps and mileage

Trail maps and mileage were the most frequent information visitors looked for before visiting (Figure 29). Among visitors who looked for information, approximately

Figure 28

Pre-trip planning information

39%

of visitors **looked for information about the trail** before their visit

Q13. To prepare for your visit today, did you or your group look for information about this trail before you came? (n = 114)

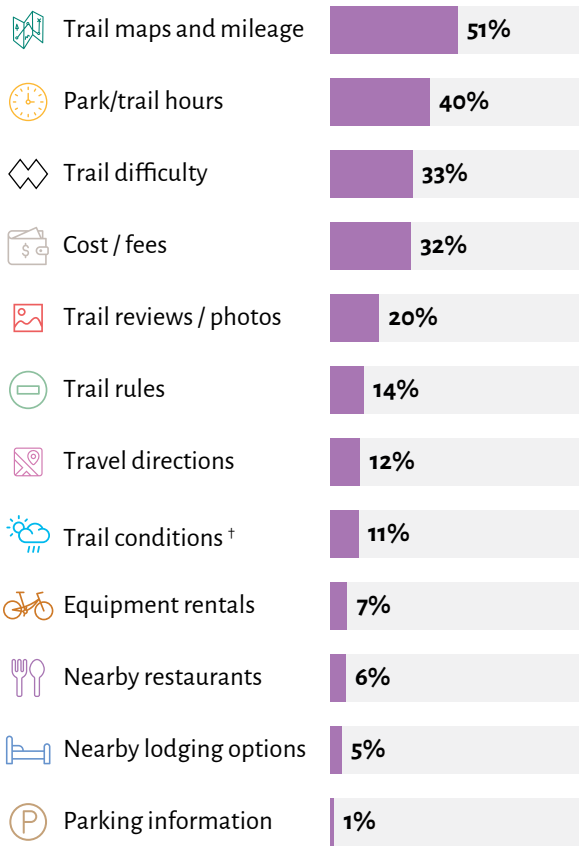
half (51%) of them looked for trail maps and mileage. A minority of visitors looked for a wide range of other information: 40% searched for DMRA's hours, 33% looked up trail difficulties, 32% looked up fees, 20% looked up trail reviews, 14% looked up trail rules, and 12% looked up travel directions. Fewer than 10% of visitors looked up equipment rentals, nearby restaurants, nearby lodging or parking information.

Of note, 12% of visitors volunteered that they looked up trail conditions (or weather) under the "other" option. Not including trail conditions on the list of options was an oversight, and had it been included significantly more visitors would likely have checked it.

Figure 29

What information do visitors search for before their visit?

Of adult visitors who looked for information before their visit, % who searched for…



Q14. What information did you search for before your visit today? *Select all that apply* [Answers presented in randomized order] (n = 113)

† "Trail conditions" was a frequent response to the open-ended "other" category. Had "trail conditions" been included as an answer choice, frequency would likely be higher.

Methodology

Overview

Data in this report is drawn from two complementary studies conducted at DMRA during the summer of 2021. First, to measure system use and traffic patterns, automated trail counters were installed at three locations across the system. Second, a visitor intercept survey contacted visitors at the cross-country trailhead and near the chair lift to collect responses on trail experience, trip characteristics, and demographics.

Trail counters were installed for varying lengths of time between May 29, 2021 (the Saturday before Memorial Day) and September 6 (Labor Day). Visitor surveys were collected between June 30, 2021 and September 18, 2021. Both studies were designed to be representative of the summer season, defined as the Saturday before Memorial Day through Labor Day. Focusing visitor studies on the summer season coincides with the peak visitation season for mountain biking and ensures comparability with other visitor studies conducted in regional and state parks and trails across Minnesota.[1]

While beyond the scope of this study, it should be noted that mountain bikers use DMRA year round, and use during other seasons (particularly the fall) may be significant. Readers should understand this report does not quantify the full, year-round regional impact that mountain biking has on DMRA and the surrounding community.

Trail Use Estimates

Data on trail use was collected using EcoCounter PYRO boxes, which are passive-infrared automated trail counters that detect trail users as they pass by. The passive-infrared counters count all users, and occasionally wildlife, that pass by and do not differentiate between bikers and hikers. Field staff validated the counters after installation by hiking or riding past the counter 50 times and ensuring it was counting properly.

The cross-country trailhead was chosen as the primary trail count location because it's open daily (weather depending) and is the primary access point to DMRA's cross-country trails (additionally, use of the downhill trails is monitored via lift tickets). A trail counter was installed between the trailhead gate and the Power Up Skills Loop for the entirety of the summer season. This location captures all visitors entering and/or exiting the cross-country trail system,

1 See "Regional Parks System Visitor Study Report" (Metropolitan Council, November 2016), "2017 State Park Visitor Survey" (Minnesota DNR, November 2017) , and "2019 Minnesota State Trail Visitor Survey" (Minnesota DNR, July 2020).

with the exception of visitors who arrive/exit via the connector trail to Mountain View Recreation Area, and thus was the best choice for a summer-long count.

In addition to the cross-country trailhead counting location, short-duration counts were conducted on the Sasquatch Climb and the West Side access trail (Figure 30). Short-duration counts ranged in length from two to three weeks. All trail counting locations were determined in consultation with DMRA staff.

At the end of the counting season, trail count data was downloaded, checked and cleaned. Several unusually high counts were recorded on the Sasquatch Climb during overnight hours (between 12am and 5am), assumed to be caused by wildlife, and removed from the dataset. Additionally, several days (June 23, August 16 and August 18) at the cross-country trailhead had an atypically large imbalance of inbound/outbound traffic and were adjusted to seasonal averages. We then analyzed the data from each trail location for daily traffic patterns, hourly traffic patterns, and estimated summer average daily traffic (SADT). Fact sheets for each trail count location are provided in Appendix A.

SADT for short-duration count locations was estimated using the day-of-year factoring method. The day-of-year factoring method is a standard method to extrapolate short-duration non-motorized traffic counts because it captures the effects of local conditions such as weather, events and holidays.[2] Under the day-of-year factoring method, observed traffic at a short-duration site is assumed to equal the proportion of season-long traffic observed at a nearby location (i.e., "reference site") where counts are collected for the entire season. We used the counts collected at the cross-country trailhead as the reference site to extrapolate data collected elsewhere on the system. For example, if traffic between June 26 and July 13 accounted for 17% of total summer traffic at the cross-country trailhead, it's assumed that observed traffic on the Sasquatch Climb during the same time period also accounts for 17% of total summer traffic on the Sasquatch Climb. This method results in estimates with a margin of error of approximately 10-15% for each short-duration trail count location.

Figure 30

Trail counting locations and dates

Location	Dates	Duration (days)
Cross-country trailhead	5/29/21 - 9/6/21	101
Sasquatch Climb	6/26/21 - 7/13/21	18
West Side Access	6/8/21 - 6/13/21; 6/23/21 - 6/24; 7/15/21 - 7/28/21	22

2 Minge, E., Falero, C., Lindsey, G., Petesch, M., & Vorvick, T. (2017). *Bicycle and Pedestrian Data Collection Manual*. Minnesota Department of Transportation.

Several technical issues plagued the counter installed on the West Side access trail. The counter malfunctioned during the initial count period and nine days of data had to be discarded. Because of the data loss, a different counter was installed at the same location from July 15 to July 28. Unfortunately, the counter experienced further technical issues during the second count period that resulted in systematically low counts being recorded. Hourly traffic patterns from the second count period, however, appear valid in terms of percentage of daily use. For analysis, valid counts from the first period (6/8 - 6/13; 6/23 - 6/24) were used to estimate SADT, while counts from the second period (7/15 - 7/28) were used to analyze hourly patterns. Admittedly, these issues introduce additional uncertainty into the traffic estimates for the West Side trails, and it's recommended future research is conducted at this location to validate our results.

The original trail count sampling plan included a fourth counting location on Shakedown Street (on the east side). Counting at that location had to be canceled due to the counter malfunctions. Additional research is recommended to understand trail traffic on DMRA's east side trails.

All summer traffic estimates are specific to 2021 and are not necessarily representative of the average year. Mountain biking and hiking traffic is highly sensitive to weather, which can vary widely from year-to-year.

Questionnaire development

The questionnaire was designed through a collaborative process between the Greater Minnesota Regional Parks and Trails Commission (GMRPTC) and Parks & Trails Council (P&TC). GMRPTC designed a draft questionnaire based on the University of Minnesota's *Handbook for Minnesota Parks and Trails Surveying* and previous surveys conducted by the Metropolitan Council.[3] P&TC reviewed the questionnaire and offered recommendations to improve questionnaire clarity, focus and length. Whenever possible, questions were designed to collect data that is comparable to visitor survey data collected by the Metropolitan Council and the Minnesota Department of Natural Resources.

Prior to finalizing the questionnaire, the instrument was pilot tested with seven volunteers at two Minnesota trail facilities. Results from the pilot were used to re-word several questions for clarity. The final questionnaire was 20 questions long, plus 13 additional questions asked only of specific users (e.g., mountain bikers, tourists). Question topics included trail activities, overall quality of the trail experience, group characteristics, trip planning, information

3 Pradhananga, A., Davenport, M.A., Saari, H. (2016). *Handbook for Minnesota Parks and Trails Visitor Surveying*. University of Minnesota, Department of Forest Resources.

sources, and demographics (Appendix B). On average, respondents took 4.5 minutes to complete the survey.

To limit potential language bias, the questionnaire was translated into English, Spanish and Somali. All respondents completed the survey in English.

Questionnaires were administered to visitors on Samsung 8" tablets using QuestionPro (a professional online survey software). The survey was stored on the tablet and did not require Wi-Fi or cellular phone service. Skips and data validation were programmed into the survey to help speed up completion and improve accuracy of data entered by the visitor. Survey responses were stored on the tablet and later uploaded to P&TC's online account. Paper surveys were also available as a backup or if requested. All surveys were completed electronically on the tablet.

Data collection protocol

The visitor survey was conducted by staff of DMRA. All surveyors attended a training session and received an 18-page training manual that reviewed project purpose, study design and procedures, checklists and frequently encountered issues.

Surveys were conducted at both the cross-country trailhead and at the chair lift (when in operation) (see Figure 1 on page 2). Only adult visitors (age 18 and older) using the singletrack trail system were eligible to take the survey, and surveyors were trained to screen all visitors to determine visitor eligibility (Appendix B). If visitors arrived as a group, the adult with the most recent birthday was asked to complete the survey.

To welcome visitors at each survey location, a "survey station" was set up at the beginning of each survey shift. The station provided a visual presence for the surveyor and included a large "Visitor Survey" sign, free water, maps, and a trash bag (Figure 31).

During each survey shift, surveyors made every effort possible to stop and talk to every visitor entering or leaving the area. Surveyors would approach each visitor group, introduce themselves, explain the purpose of the survey and ask them to participate. If the visitor agreed they were handed the tablet and self-administered the questionnaire. If the visitor asked

Figure 31

Visitor survey station

to be administered the questionnaire verbally, the surveyor did so by reading the questionnaire verbatim and recording responses on the tablet. All visitors were assured their participation was completely voluntary and that their identities would be anonymous.

In instances where high traffic volumes made it impractical to approach every visitor, the "next to pass method" was used to select respondents. During these periods, surveyors simply selected and approached the next group or person to pass the survey site after a questionnaire had been completed by someone else.

Sampling

A stratified sampling plan was developed to ensure the survey sample was as representative of summer visitors as possible. Surveys were conducted for a total of 90 hours stratified across high-use and low-use periods (Figure 32). Surveying hours were split between weekends (57%)

Figure 32

Survey dates, times and completions

Date	Day	Location	Time	Hours	Completed
6/30/21	Wed	Cross-country trailhead	4pm - 8pm	4	3
7/3/21	Sat	Lift / Downhill trails	11am - 3pm	4	7
7/4/21	Sun	Cross-country trailhead	10am - 2pm	4	13
7/8/21	Thu	Cross-country trailhead	9am - 1pm	4	5
7/11/21	Sun	Cross-country trailhead	12pm - 2pm	2	5
7/15/21	Thu	Cross-country trailhead	12pm - 4pm	4	1
7/16/21	Fri	Cross-country trailhead	4pm - 8pm	4	0
7/17/21	Sat	Cross-country trailhead	9am - 1pm	4	10
7/18/21	Sun	Lift / Downhill trails	9am - 1pm	4	5
7/22/21	Thu	Cross-country trailhead	4pm - 8pm	4	6
7/24/21	Sat	Cross-country trailhead	12pm - 4pm	4	4
7/25/21	Sun	Lift / Downhill trails	11:30am - 3:30pm	4	9
7/29/21	Thu	Cross-country trailhead	11:30am - 3:30pm	4	2
7/30/21	Fri	Cross-country trailhead	3pm - 6pm	3	6
7/31/21	Sat	Lift / Downhill trails	1pm - 5pm	4	4
8/11/21	Wed	Cross-country trailhead	3pm-7pm	4	3
8/13/21	Fri	Cross-country trailhead	8am-12pm	4	4
8/21/21	Sat	Cross-country trailhead	2pm - 6pm	4	1
8/25/21	Wed	Cross-country trailhead	3pm-7pm	4	2
9/4/21	Sat	Cross-country trailhead	11am - 3pm	4	5
9/5/21	Sun	Lift / Downhill trails	12pm - 5pm	5	13
9/11/21	Sat	Lift / Downhill trails	1pm - 5pm	4	3
9/18/21	Sat	Cross-country trailhead	10am - 2pm	4	5

and weekdays (43%). On average, 0.8 surveys were completed per hour on weekdays and 1.6 surveys were completed per hour on weekends. The majority of surveys (72%) were completed on weekends.

Response Rate and Margin of Error

A total of 139 eligible visitor groups were approached and asked to complete the questionnaire. Of those, 116 visitors completed a survey for a response rate of 83%. This response rate is exceptionally high and sufficient to allay any concerns of non-response bias (in which results are biased due to systematic differences between people who are willing to complete the survey and those who are not).

Whenever a visitor declined to participate, the surveyor recorded the group size, primary activity and inquired if they would be willing to quickly answer four short "non-response questions."[4] The purpose of these questions was to test if visitors who declined to participate were systematically different from those who participated. Very few non respondents answered the non-response bias questions (only 6 of the 23 non responders). Non-respondents, however, were similar to respondents in terms of primary activity, group size and percentage recreating with children. The final sample size (n=116) provides 95 percent confidence that the sampling error does not exceed plus or minus 9.1 percent. Margins of error are higher in subgroups (Figure 33).

In addition to sampling error, question wording and other biases can introduce error into surveys. To reduce answer option order bias, answers were randomized for non-ordinal answer choices.

Data Analysis

Survey data was downloaded from the QuestionPro server and prepped for import into the statistical software SPSS using Microsoft Excel. SPSS was used for accuracy checks, recoding, descriptive statistics, cross-tabulations, and statistical significance testing.

Throughout the report, unless otherwise specified, the word "average" refers to

Figure 33

Margin of error for selected subgroups

Member segment	Sample size	Plus or minus... (percentage points)
All adult visitors	116	9.1
Tourism		
Local visitors	34	16.8
Tourist	80	10.9
Day visitors	37	16.8
Overnight visitors	43	14.9
Skill Level		
Beginner/Intermediate	65	12.2
Advanced/Expert	44	14.8

4 (1) What language do you speak most often at home? (2) Approximately how often do you visit this trail during spring, summer and fall? (3) What is your zip code (or country)? (4) What year were you born?

the sample's median rather than mean. Means are provided where informative with an accompanying confidence interval. Confidence intervals are written as 95% C.I. [#, #], where the bracketed numbers refer to the upper and lower bounds of the 95% confidence interval for the reported mean.

Statistical hypothesis tests are included throughout the report to indicate statistically significant differences between visitor subgroups (e.g., locals and tourists, men and women, skill levels, etc.). Probability values (p-value) are included alongside these tests to indicate the probability the observed differences are due to actual underlying differences in the population rather than sampling error. Researchers typically use a probability threshold of 5% to indicate "statistical significance" ($p < 0.05$), meaning there is less than a 5% chance the difference would be observed if no actual differences existed between the two subgroups. This report largely adheres to the 5% standard, though occasionally includes differences with a higher probability of being due to random chance ($p < 0.10$).

Responses to the open-ended question asking respondents if they had any additional comments were loosely grouped into categories and are provided in Appendix C.

Weighting

Despite our best efforts to sample a representative set of visitors, weekend visitors were over-represented in our final dataset (Figure 34). To compensate for this sampling bias, the survey data was weighted by day of week (weekday vs. weekend) and time of day (morning visitors vs. afternoon/evening visitors). Weighting the data provides a more accurate reflection of all visitors, but must be done cautiously because it risks over-representing the views of several people who may not be an accurate reflection of their subgroup. For all analyses we created two sets of cross-tabulations: one set weighted and one set unweighted. Cross-tabs were compared side-by-side to verify the weighting didn't

Figure 34

Data weights

Visitor segment	Percentage of total traffic	Completed surveys	Percentage of survey sample	Weight
Weekday AM visits	14%	17	9%	1.62
Weekday PM visits	40%	93	19%	2.11
Weekend AM visits	17%	34	25%	0.68
Weekend PM visits	29%	75	47%	0.61

Note: Total traffic based on trail count conducted at the cross-country trailhead

cause any extreme or unexplainable changes in the dataset.

Challenges

The primary unanticipated challenges were twofold: the counter malfunctions at the West Side access trail location (discussed earlier) and the relatively low rate of survey collection. The original sampling plan, modeled largely on the *Handbook for Minnesota Parks and Trails Surveying,* anticipated collecting 4 to 5 completed surveys per hour in the field. Under that assumption, the original sample plan scheduled 80 hours of surveying, with flexibility to add 20 extra hours if necessary, in order to collect 400 completed surveys.

After the first few weeks of collecting surveys in the field, it became clear that collection rates of 4 to 5 surveys per hour was unattainable. At that point, several changes were made in the survey collection protocol in an attempt to increase responses without compromising data integrity. First, additional survey hours were scheduled and the survey sampling window was extended into the third week of September. Due to staff shortages and several surveying dates being canceled due to rain, however, only 10 additional hours were completed. Second, because several questions asked visitors about their experience (e.g., How long were you on the trail? How would you rate your experience?), the original survey protocol was to *only* survey visitors as they were leaving DMRA. This had the drawback of missing visitors who arrived later during the surveying shift and were still on the trail when the surveyor left. To compensate for this, the survey protocol was changed so that, during the final two hours of the surveying shift, surveyors started offering the survey to all visitors. If a visitor was just arriving, they were instructed to answer the "How long did you spend on the trail" and "How would you rate your overall experience on the trail" based on their most recent visit to DMRA. If it was a first-time visitor, they were instructed to skip those two questions.

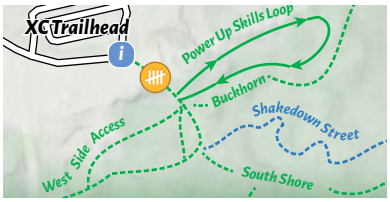
Despite those changes to increase completion rates, our final sample size (n=116) was well below our sampling quota (n=400). The primary drawback of a smaller size is increased uncertainty; Rather than a desired margin of error of plus or minus 5 percentage points, the margin of error for this study was plus or minus 9.1 percentage points, which is relatively large for visitor studies. Readers are cautioned to interpret all results with this context.

Small sample sizes also limit the ability to analyze differences between different groups of users. Consequently, there are likely additional group differences that were missed by this study. Readers should be aware visitor segments may differ in more ways than this study was able to conclude.

Detroit Mountain XC Trailhead

2021 TRAFFIC ESTIMATES

Counting Location:



Counting Period:
May 29, 2021 - Sept 6, 2021

Summer ADT: 179

Inbound traffic: 99
Outbound traffic: 81

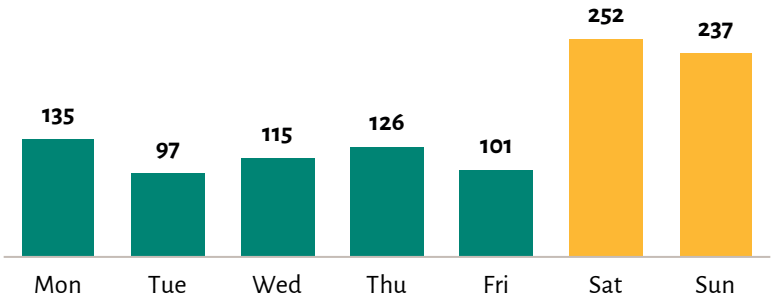
Weekday Peak Hour: 6:00pm
Weekend Peak Hour: 11:00am

Estimated 2021 Summer Traffic

Total Two-Way	Inbound (to parking)	Outbound (to trails)
18,103	10,138 (56%)	7,965 (44%)

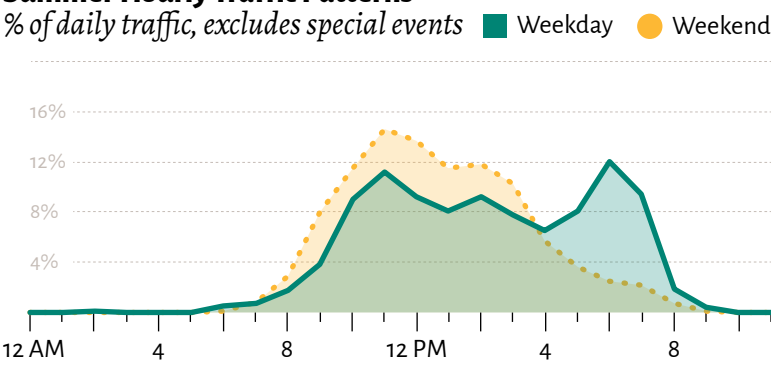
Summer Day-of-Week Patterns

Average total summer traffic, excludes special events

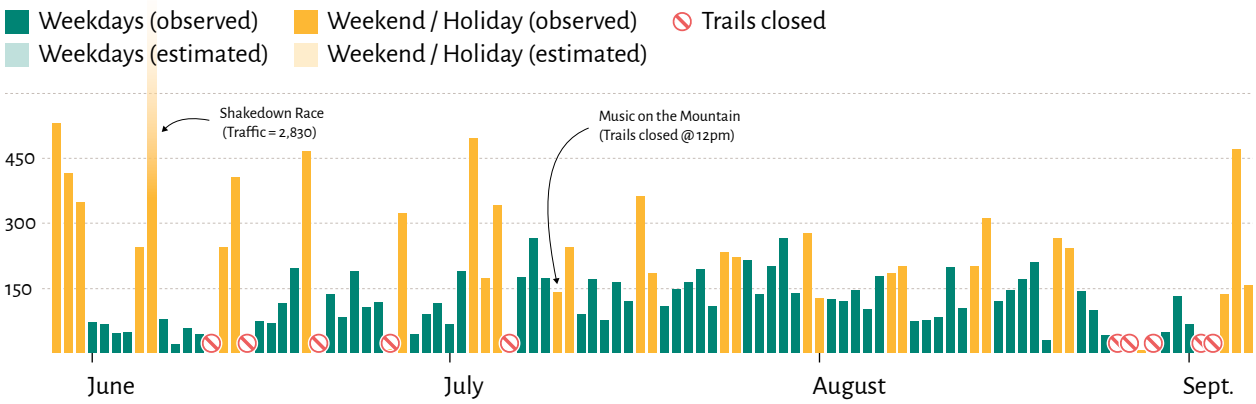


Summer Hourly Traffic Patterns

% of daily traffic, excludes special events



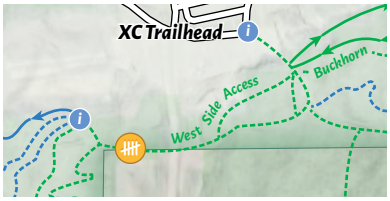
Estimated and Observed 2021 Summer Total Daily Traffic



Detroit Mountain West Side Access

2021 TRAFFIC ESTIMATES

Counting Location:



Counting Period: *

Jun 8, 2021 - Jun 13, 2021
Jun 23, 2021 - Jun 24, 2021
Jun 26, 2021 - Jul 13, 2021
* See methodology for notes

Summer ADT: 141

Inbound traffic: 70
Outbound traffic: 70

Weekday Peak Hour: 6:00pm
Weekend Peak Hour: 10:00am

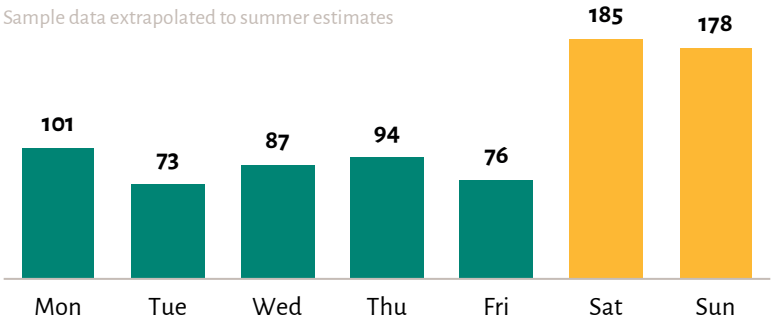
Estimated 2021 Summer Traffic

Total Two-Way	Eastbound	Westbound
14,235	7,118 (50%)	7,118 (50%)

Summer Day-of-Week Patterns

Average total summer traffic, excludes special events

Sample data extrapolated to summer estimates

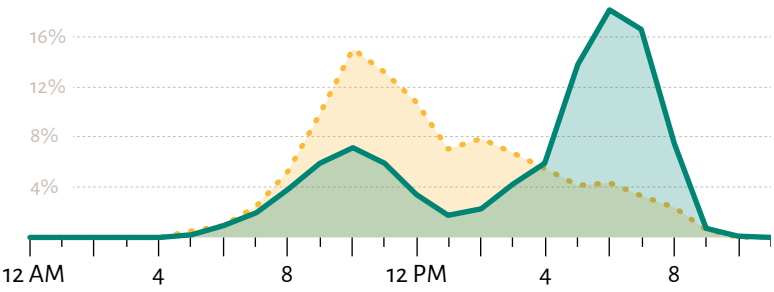


Summer Hourly Traffic Patterns

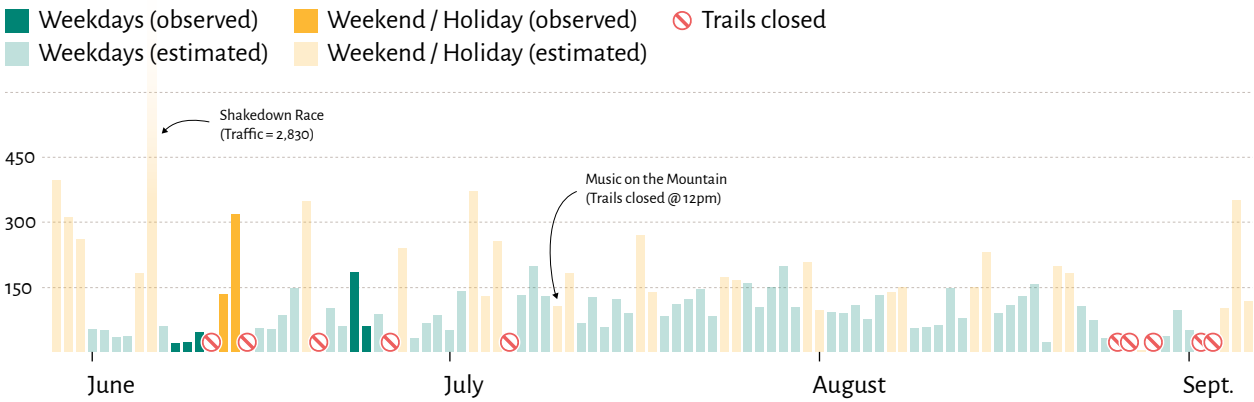
% of daily traffic, excludes special events

Weekday Weekend

Short-duration count data (smoothed)



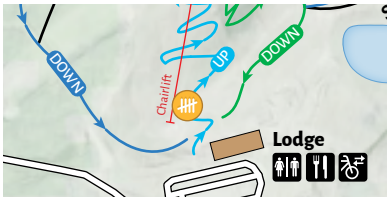
Estimated and Observed 2021 Summer Total Daily Traffic



Detroit Mountain Sasquatch Climb

2021 TRAFFIC ESTIMATES

Counting Location:



Counting Period:
Jun 26, 2021 - Jul 13, 2021

Summer ADT: 20

Uphill traffic: 14
Downhill traffic: 6

Weekday Peak Hour: 11:00am
Weekend Peak Hour: 11:00am

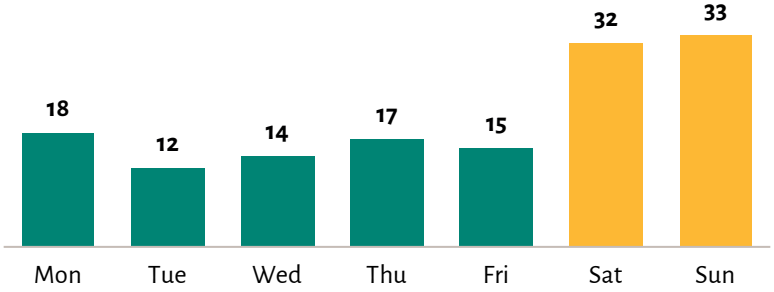
Estimated 2021 Summer Traffic

Total Two-Way	Uphill	Downhill
2,054	1,438 (70%)	616 (30%)

Summer Day-of-Week Patterns

Average total summer traffic, excludes special events

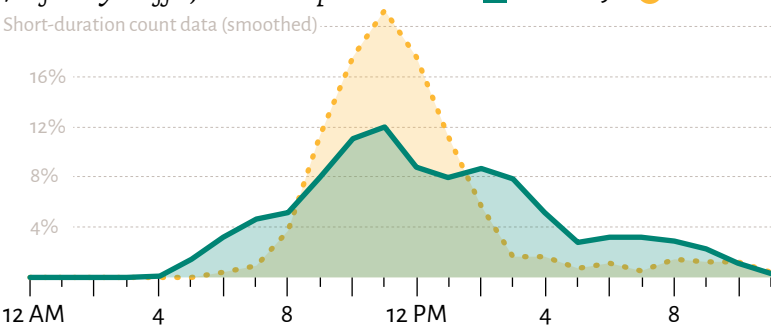
Sample data extrapolated to summer estimates



Summer Hourly Traffic Patterns

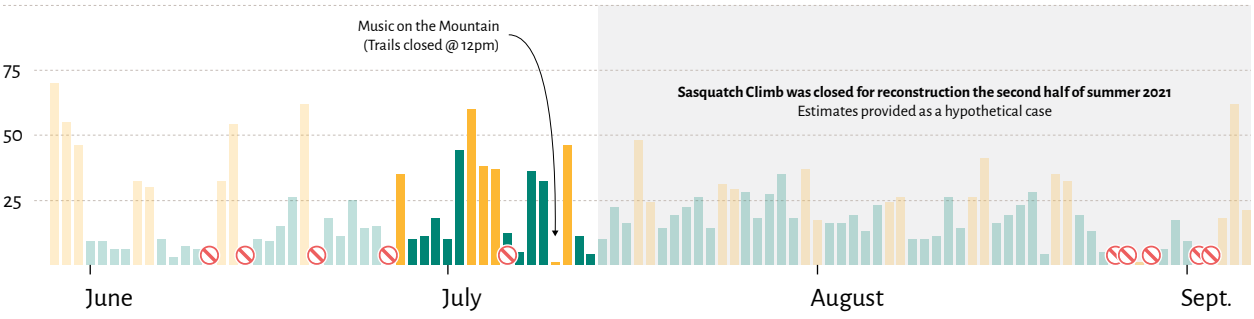
% of daily traffic, excludes special events Weekday Weekend

Short-duration count data (smoothed)



Estimated and Observed 2021 Summer Total Daily Traffic

Weekdays (observed) Weekend / Holiday (observed) Trails closed
Weekdays (estimated) Weekend / Holiday (estimated)



Appendix B: Survey Instrument

Greater Minnesota Regional Trails Survey

Survey Script:

Hi, my name is _____ and I'm working with Parks & Trails Council conducting a 6-minute trail survey to understand visitor experiences at Detroit Mountain. Are you leaving the trail, or did you just arrive?

☐ Leaving the trail, or in the middle of their trail experience **[Continue]**
☐ Just arrived **[Say thanks; Ask that they stop by later on in the day]**

Are you willing to participate in the survey? All your answers are voluntary and confidential.

If **YES:**

Is anyone in your group 18 years old or older?

☐ Yes **[Continue]**
☐ No **[Discontinue; log Non-Response]**

Have you already taken this survey at this trail this summer, or were you with someone when they completed the survey at this trail this summer?

☐ Yes **[Discontinue survey]**
☐ No **[Hand visitor the tablet and let them complete the questionnaire; If multiple adults in the group are willing to participate, only the adult in the group with nearest birthday should complete the survey]**

If **NO**:

That's okay, no problem. Thanks for your time. Do you mind if I ask you just four quick questions before I let you go?

☐ Yes **[Ask questions, log Non-Response Qs]**

1. What language do you speak most often at home?
2. Approximately how often do you visit this trail during spring, summer and fall?
3. What is your zip code (or country)?
4. What year were you born?

☐ No **[Discontinue; log Non-Response]**

Trail Experience

1. Which trail activities are you and your group doing during your visit today? [RANDOMIZE]
(Select all that apply)
☐ Mountain biking
☐ Hiking or walking
☐ Dog walking
☐ Running or jogging
☐ Horseback riding
☐ Geocaching
☐ Nature photography
☐ Birdwatching / wildlife viewing
☐ Other (please specify): _____

2. [IF MULTIPLE ACTIVITIES SELECTED] Which one of these activities was your main reason for visiting this trail? _____

3. [IF Q1 = MOUNTAIN BIKING] Do you have a favorite place in Minnesota to go mountain biking?
☐ Yes. Where? _____
☐ No

4. [IF Q1 = MOUNTAIN BIKING] What is your mountain biking skill level?
☐ Beginner
☐ Intermediate
☐ Advanced
☐ Expert

5. [IF Q1 = MOUNTAIN BIKING] Are you riding a fat-tire bike today?
☐ Yes
☐ No

6. [IF Q1 = MOUNTAIN BIKING] Are you riding your own bike today?
☐ Yes, I'm using my own bike
☐ No, I'm using a rental bike
☐ No, I'm borrowing a bike from a friend or family member

7. What are your most important reasons for visiting the trail today? [RANDOMIZE]
(Select all that apply)
☐ Experience nature
☐ Improve my physical health
☐ Relaxation and/or stress relief
☐ Spend time with family or friends
☐ Meet new people
☐ Training for event/competition
☐ Do something exciting and adventurous
☐ Learn/practice tricks and skills
☐ Getting my children outdoors
☐ Other, please describe: _____

8. Approximately how much time did you spend at the trail on this visit?

_____ hours
_____ minutes
☐ Unsure

9. Approximately how often do you visit this trail during spring, summer and fall?

☐ This is my first time visiting
☐ Daily
☐ Weekly
☐ Monthly
☐ Once a year
☐ Less than once a year
☐ Unsure

10. Overall, how would you rate your trail experience today?

☐ Very good
☐ Good
☐ Fair
☐ Poor
☐ Very poor

11. How many people are in the group you're recreating with today?

_____ Adults (18 years and older, including yourself)
_____ Children (under 18 years)

Information / Planning

12. What information sources have you used to learn about this trail? [RANDOMIZE]
(Select all that apply)

☐ I've known about this trail for years
☐ Friends and family
☐ From a club / group ride
☐ Recommendation from a business, visitor center, etc.
☐ "Minnesota Great Outdoors" online park and trail finder
☐ Internet search (e.g., Google)
☐ Social media (e.g., Facebook, Twitter, Instagram, etc.)
☐ Official Website:
  ☐ Detroit Mountain Recreation Area website
  ☐ Visit Detroit Lakes website
  ☐ "Minnesota Great Outdoors" online park and trail finder
☐ Trail app/website:
  ☐ MTB Project
  ☐ Singletracks
  ☐ MapMyRide
  ☐ Other: _____
  ☐ Trail Forks
  ☐ Strava
  ☐ All Trails
☐ Print publication (brochure, magazine, or newspaper)
☐ TV or radio
☐ Other: _____

13. To prepare for your visit today, did you or your group look for information about this trail before you came?

☐ Yes
☐ No

14. [IF Q13 = YES] What information did you search for before your visit today?
[RANDOMIZE]
(Select all that apply)

☐ Travel directions
☐ Trail rules / Allowed trail activities
☐ Trail maps and miles
☐ Trail difficulty
☐ Trail reviews / photos
☐ Cost/Fees
☐ Equipment rentals
☐ Parking information
☐ Park/trail hours
☐ Nearby lodging options
☐ Nearby restaurants
☐ Other: _____

Tourism / Trip Info

15. Do you live more than 50 miles from this trail?
☐ Yes
☐ No

16. Are you on a trip where you have or plan to stay at least one night away from home?
☐ Yes
☐ No

17. [IF Q15 AND/OR Q16 = YES] How important was the trail in deciding to visit this area?
☐ The trail was the primary reason why I visited the area
☐ The trail was a significant reason why I visited the area
☐ The trail was part of the reason why I visited the area
☐ I would have visited this area even without the trail
☐ Don't know

18. [IF Q16 = YES] How many total nights do you plan to spend in this area during your trip? _____

19. [IF Q16 = YES] What type of overnight accommodations are you staying in during your trip? [RANDOMIZE]
Select all that apply
☐ Hotel / motel
☐ Resort / lodge / commercial cabin
☐ Vacation rental by owner (Airbnb, VRBO, etc.)
☐ Bed & Breakfast
☐ Campground
☐ Home/cabin of friend or relative
☐ My own vacation home
☐ Other: _____

20. [IF Q15 AND/OR Q16 = YES] How far in advance did you plan this trip?
☐ Less than 1 week
☐ 1 to 2 weeks
☐ 1 month
☐ 1 - 2 months
☐ 2 - 3 months
☐ 3+ months

Demographics

21. What is the zip code of your home address, or what is your country of residence?
a. Zip Code: _____ *or* b. Country:_____

22. What year were you born? _____

23. What is your gender identity?
☐ Female
☐ Male
☐ Non-binary / third gender
☐ Prefer to self-describe: _____
☐ Prefer not to answer
☐ Don't know

24. Do you identify as transgender?
☐ Yes
☐ No
☐ Prefer not to answer
☐ Don't know

25. How do you describe yourself?
(Select all that apply)
☐ Asian
☐ Black or African American
☐ Hispanic or Latinx
☐ Native American, First Nation or Alaskan Native
☐ Middle Eastern or North African
☐ White or Caucasian
☐ Pacific Islander
☐ Some other race, ethnicity or origin

26. [IF Q25 = NATIVE AMERICAN] Which tribe do you affiliate with?
(Select all that apply)
☐ Bois Forte Band of Chippewa
☐ Fond du Lac Band of Lake Superior Chippewa
☐ Grand Portage Band of Lake Superior Chippewa
☐ Leech Lake Band of Ojibwe
☐ Lower Sioux Indian Community
☐ Mille Lacs Band of Ojibwe
☐ Prairie Island Indian Community
☐ Red Lake Nation
☐ Shakopee Mdewakanton Sioux Community
☐ Upper Sioux Community
☐ White Earth Nation
☐ Other (please specify): _____
☐ Prefer not to answer
☐ Don't know

27. What language do you speak most often at home?
☐ English
☐ Hmong
☐ Somali
☐ Spanish
☐ Other (please specify): _____
☐ Prefer not to answer
☐ Don't know

28. [IF Q27 ≠ ENGLISH] How well do you speak English?
- ☐ Very well
- ☐ Well
- ☐ Not well
- ☐ Not at all
- ☐ Prefer not to answer
- ☐ Don't know

29. What is the highest level of education you have completed?
- ☐ Less than high school
- ☐ High school graduate or GED
- ☐ Some college, but no degree
- ☐ Associate, vocational, or technical degree
- ☐ Bachelor's degree
- ☐ Graduate or professional degree
- ☐ Prefer not to answer

30. Do you, or does someone in your group, have a physical, mental or sensory disability or condition?
- ☐ Yes
- ☐ No
- ☐ Prefer not to answer
- ☐ Don't know

31. Please indicate your total household income before taxes last year
- ☐ Less than $20,000
- ☐ $20,000 - $29,999
- ☐ $30,000 - $39,999
- ☐ $40,000 - $49,999
- ☐ $50,000 - $59,999
- ☐ $60,000 - $69,999
- ☐ $70,000 - $79,999
- ☐ $80,000 - $89,999
- ☐ $90,000 - $99,999
- ☐ $100,000 - $149,999
- ☐ $150,000 - $199,999
- ☐ $200,000 or more
- ☐ Prefer not to answer

32. Do you have any additional comments about your visit you'd like to share?

Thank you!

Appendix C: Responses to open-ended "Additional Comments" (Q32)

Positive comments about the trails:

Add more beginner or intermediate jumps that are more forgiving like tables or rollers

Always fun

Amazing

Beautiful facilities! We're so glad you're here!

Excellent experience

Great trails!

Great experience

Great place good trails

I love coming to detroit mountain. Great park and great staff.

I really appreciate the well planned and groomed trails. Looking forward to having even more trails as part of this park....
I'd come more often and stay longer! (My family and I feel the same about your winter cross country ski trails too; like them and would like even more).

Like the ImPROVEments

Love coming to DM

Love it here

Love it here. Recommend it to everyone.

Love it!

Love the flow trails without rocks 4 kids

Love this place

Nice work on the trails

The trails are an asset to mn

This place is great!

Trails in great condition. Lodge +++. Good communication and updated website

You have a great trail system! Love the new trails!

Comments about expanding the system:

Keep adding and improving the XC trails!

Keep building new trails:)

More optional features on the cross country trails?

Comments about trail signage:

Beautiful hiking trail, TERRIBLE signage. Put up some signs to help walkers. Not hard to do. You have a real resource here, if you just make its a little easier

Miscellaneous comments:

Dairy queen. And survey girls were awesome and really nice!

This survey is too long

For more information:

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