

Mystic Lake Project

2019 Recreation Use Monitoring



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January 2020

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Summary

Monitoring Overview

- o A recreation visitor survey was conducted in 2019 at NorthWestern Energy's Mystic Lake Project. Visitor survey sampling occurred during the peak recreation use season, from May 24 through September 2 (Memorial Day weekend through Labor Day weekend).
- o Surveys from 344 recreation visitors were collected at West Rosebud Lake and the Mystic Lake Trailhead (145 and 199 respectively). Sampling occurred on 32 days over the course of the study. In all, each site was sampled 64 times.
- o Automated traffic counters collected vehicle counts on West Rosebud Road near West Rosebud Lake and trail counts at three trail locations (the lower end of Mystic Lake Trail and two locations above Mystic Lake).

Results

- o Eighty-five percent of visitors that were contacted participated in the survey (95% of West Rosebud Lake visitors and 78% of Mystic Lake Trailhead users).
- o Nearly two-thirds (64%) of trailhead visitors and 59% of West Rosebud Lake visitors were male.
- o The median age of visitors (aged 16 or older) was slightly older at West Rosebud Lake than at the trailhead (41 vs. 37).
- o Overall, 87% of visitors were from Montana, with most coming from Yellowstone County (57% of West Rosebud Lake visitors and 53% of trailhead users).
- o First-time visitors were more common at Mystic Lake Trailhead than West Rosebud Lake (44% vs. 29%). Lake visitors with previous experience had generally visited for 14 years and made 3 visits per year. Trailhead visitors with previous experience had generally visited for 9 years and made 2 visits per year.
- o The median group size at recreation sites was three people. Groups using the lake were slightly larger than groups using the trail.
- o The median length of stay for West Rosebud Lake visitors was four hours. Sixty-five percent of Mystic Trail users were day hikers that spent about five hours on the trail; overnight backpackers comprised the remaining 35% and were out for one night.
- o Ninety-five percent of Mystic Lake Trail users reported reaching the Mystic Lake / dam overlook area or beyond. About half (48%) went as far as the trail along the lake, while 39% went into the backcountry beyond Mystic Lake.
- o Overall, about one-quarter (27%) of visitors stayed overnight at Emerald Lake or Pine Grove Campground during their trip. West Rosebud Lake visitors were about three times as likely to have stayed at a campground as trailhead users (43% vs. 15%).

- o Viewing scenery was a very popular activity, with 82% of Mystic Lake Trail users and 65% of West Rosebud Lake visitors participating. Fishing was also popular among users of both sites, with 81% of lake users and 40% of trail users participating. Forty-three percent of West Rosebud Lake visitors and 33% of trail users picnicked.
- o Lake visitors that fished generally did so at West Rosebud Lake (83%), Emerald Lake (10%), or West Rosebud Creek (5%). Trail users were most likely to have fished at Mystic Lake (58%) or Island Lake (26%).
- o Visitors were generally satisfied with facilities, with 80% of West Rosebud Lake visitors and 76% of trailhead visitors reporting being “very” or “extremely” satisfied. Visitors that reported low levels of satisfaction most often cited poor bathroom conditions as the source of dissatisfaction, along with a lack of parking.
- o Eighteen percent of Mystic Lake Trail users rated the trail to the lake as “moderately” to “extremely” crowded, while 15% gave this rating to the trail along Mystic Lake. More than three-quarters (78%) of West Rosebud Lake visitors rated West Rosebud Lake as “not at all” or “slightly” crowded.
- o Ten percent of visitors reported encountering problems at West Rosebud Lake, and 8% reported problems at Mystic Lake Trailhead or up the trail. The presence of trash, too many dogs and dog waste, and poor bathroom conditions were cited as problems encountered by trailhead users, while poor road conditions and litter were cited as problems by lake users.
- o Overall, visitors were very satisfied with their experience on the Mystic Lake Trail or at West Rosebud Lake, with 98% of trail users and 96% of West Rosebud Lake visitors reporting being “very” or “extremely” satisfied.
- o Thirty-eight percent of visitors offered additional comments for managers. One-third of those comments related to how much they liked the area and/or its recreation opportunities. Another one-third related to the poor road conditions. Remaining comments related to specific issues regarding needs for additional signage, parking, or structures to provide shade and fishing access, as well as conflicts with other users, dogs, or dog waste.
- o Over the course of the study, nearly 7,500 vehicles (an average of 78 per day) traveled to recreation opportunities on West Rosebud Road. About 40% of this traffic translated to trail use while the remaining 60% were groups using West Rosebud Lake.
- o More than half of the visitation was on weekends (53%), while 47% was on weekdays. Peak single-day visitation occurred in early July, while peak week-long visitation was the first week in August.
- o Over the course of the study, more than 9,200 recreationists used the Mystic Lake Trail. Fifty-nine percent of Mystic Lake Trail use occurred on weekends, with peak use occurring on July 20.
- o The Phantom Creek Trail above Mystic Lake was used by 748 visitors while the Huckleberry Creek Trail was used by 381 visitors.

Comparison to 2013 Results

- o There were many similarities between results from the 2019 and 2013 visitor surveys. In general, the visitor population remained about the same in terms of gender distribution, age, origin, and group size.
- o The proportion of first-time visitors grew by 9% at West Rosebud Lake and 8% at Mystic Lake Trailhead.
- o The length of stay for groups at West Rosebud Lake decreased from 5 hours in 2013 to 4 hours in 2019. Trail users were somewhat more likely to stay overnight at Mystic Lake or in the backcountry in 2019, though they typically stayed only 1 night (compared to 2 nights in 2013) and day users stayed 4 hours, on average, compared to 5 hours in 2013.
- o Trail users were more likely to go further into the backcountry in 2019 than in 2013.
- o Visitors were less likely to have stayed overnight at Emerald Lake or Pine Grove campgrounds in 2019.
- o Viewing scenery was as popular in 2019 as in 2013. Participation in fishing more than doubled at West Rosebud Lake over the six-year interval, while picnicking declined slightly, and walking/hiking declined somewhat among West Rosebud Lake users. These results were anticipated, however, since construction of a boat ramp and handicap-accessible fishing pier during the 2013 visitor survey restricted use of those primary access areas during that timeframe. Therefore, 2019 results are more typical of actual recreation activities than those found in the 2013 study.
- o Satisfaction with site facilities and encountering problems were very similar to 2013.
- o Crowding was very similar at West Rosebud Lake (average of 1.75 in 2013 versus 1.77 in 2019, on a scale of 1-5). However, crowding on the trail to Mystic Lake and the trail along Mystic Lake increased (or worsened) during the six-year interval from an average rating of 1.95 to 2.26 and 1.67 to 1.95 on a scale of 1-5, respectively.
- o Visitor satisfaction with their overall experience remained very high in 2019, even slightly higher than in 2013.
- o The volume of visitors that used the area increased 12% in 2019 compared to 2013, for a total of 7,419 groups. Use of the Mystic Lake Trail increased 45% compared to 2013, while use of Phantom Creek and Huckleberry Creek trails increased 23% and 17%, respectively.

1 Introduction

1.1 Background

NorthWestern Energy monitors recreation use associated with its Mystic Lake Hydroelectric Project (Project) as part of its FERC-related recreation responsibilities. Information from the monitoring helps NorthWestern Energy and the Forest Service understand the types and volume of recreation that occurs at West Rosebud Lake, on the Mystic Lake Trail, and at Mystic Lake.

Pursuant to Article 401 of the Project's FERC license¹ (License) and U.S. Forest Service Section 4(e) Condition 11, NorthWestern Energy developed a Recreation Plan for the Project in consultation with the Forest Service in 2009 based on baseline information collected in 2001, 2002, and 2005. The Recreation Plan outlines recreation-related measures to be implemented at the Project, including visitor survey information about use of West Rosebud Lake, Mystic Lake Trail, and Mystic Lake, and use counts of West Rosebud Road, Mystic Lake Trail, and trails leading from the lake to the surrounding backcountry. A visitor survey and use counts study were conducted in 2013 and scheduled for every six years thereafter over the term of the License. NorthWestern Energy consults with the Forest Service on study design for the visitor survey and collection of use counts.

1.2 Sampling Details

The 2019 study included two components: a visitor survey and visitor use counts. The visitor survey was conducted at West Rosebud Lake and the Mystic Lake Trailhead (Figure 1), from May 24 (beginning of Memorial Day Weekend) through September 2 (Labor Day).

In most cases, visitors completed the survey onsite, either by completing a hardcopy questionnaire or participating in an interview. In cases at the trailhead where visitors were embarking on their hike and hadn't yet acquired experiences to report, survey packets were distributed and questionnaires were returned through the mail. Mail-return questionnaires were also used in some instances at both sites when visitors expressed a preference to respond to the survey via mail.

Visitor sampling was scheduled on 32 days of the peak recreation season, or 31% of the 102 days from the beginning of Memorial Day weekend through Labor Day. Sampling occurred over approximately six hours on each scheduled day, alternating between recreation sites at West Rosebud Lake and the Mystic Lake Trailhead. In all, a total of 189 hours and 10 minutes were spent sampling: 94 hours and 25 minutes were spent at West Rosebud Lake on 32 days while 94 hours and 45 minutes were spent at the Mystic Lake Trailhead on 32 days.

To reduce sampling bias, sampling was scheduled four times on each weekday (Monday through Friday) throughout the season, and six times on each weekend day (Saturday and Sunday). Timing of the sampling was further distributed so that morning, mid-day, afternoon, and evening hours were equally represented.

¹ Issued on December 17, 2007 and effective beginning January 1, 2010.

In total, 344 visitor groups participated in the survey (145 at West Rosebud Lake and 199 at Mystic Lake Trailhead). Results from the 2019 visitor survey provide information about visitor characteristics, site use, facility and trip satisfaction levels, perceptions of crowding, and other factors.

The 2019 visitor use counts were conducted with automated counters. A vehicle counter collected counts on West Rosebud Road immediately northeast of West Rosebud Lake (the first Project-related recreation resource encountered along the road, Figure 2). Three trail counters measured trail use on Mystic Lake Trail and two trails leading to the backcountry above Mystic Lake (Phantom Creek and Huckleberry Creek Trails). The use count methods replicated ones used in 2013 and the baseline study, which allowed some comparison of results.

1.3 Report Organization

This report provides information about the 2019 recreation use monitoring and is organized into three sections.

The *Study Methods* section describes the objectives of the visitor survey and use counts and their study frameworks. The visitor survey questionnaires are included as *Appendices A* and *B*.

The *Visitor Survey Results* section discusses survey results for West Rosebud Lake visitors and Mystic Lake Trail users, and often compares to the 2013 study results.

The *Visitor Use Count Results* section discusses the magnitude and timing of visitation to Project-related recreation resources and offers comparison to 2013 data.

Figure 1. Visitor Survey Locations

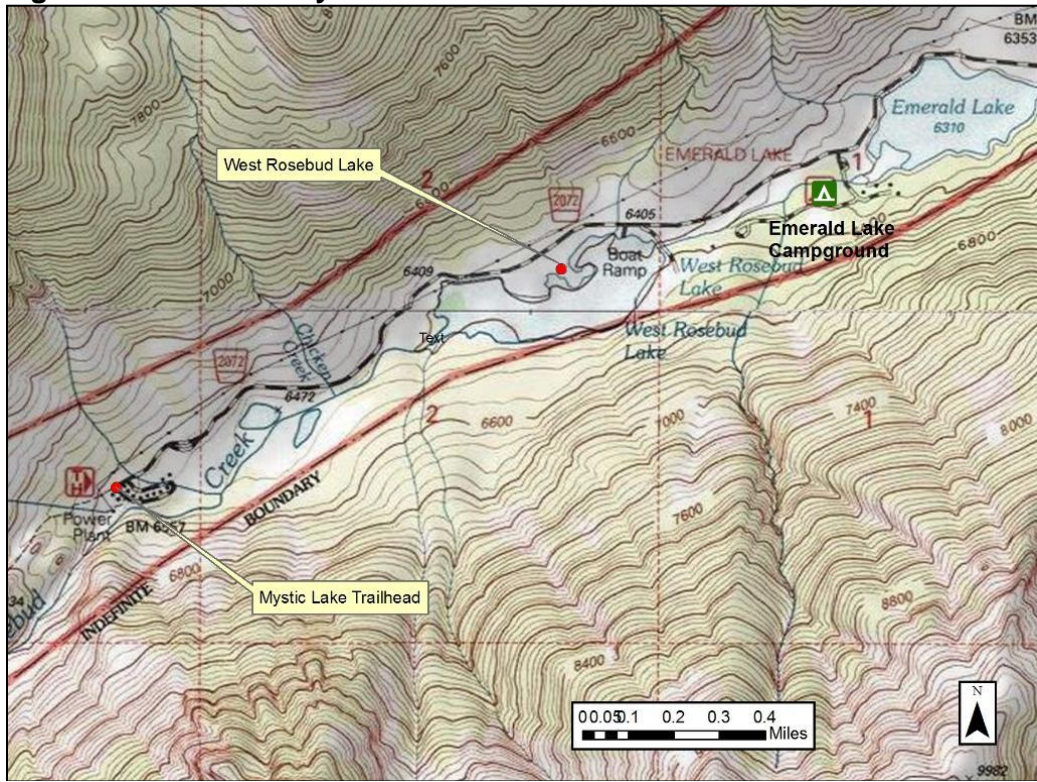
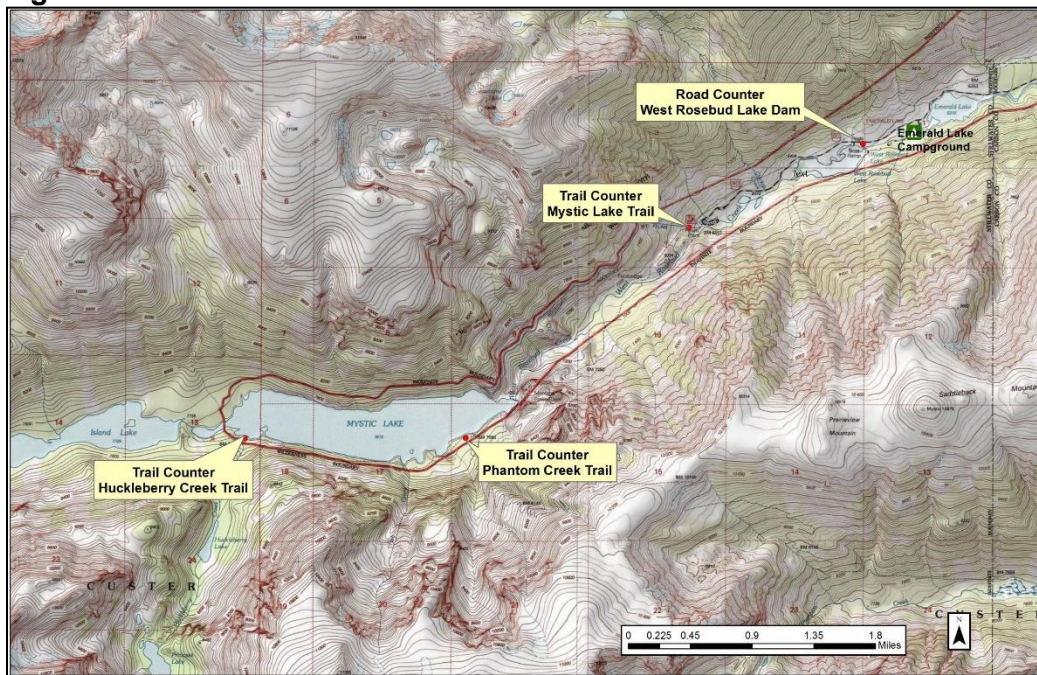


Figure 2. Counter Locations



2 Study Methods

2.1 Visitor Survey Methods

2.1.1 Survey Goal

The goal of the visitor survey was to better understand visitor use and opinions related to recreation resources associated with NorthWestern Energy's Mystic Lake Project at West Rosebud Lake, Mystic Lake Trail, and Mystic Lake.

2.1.2 Survey Objectives

Visitor survey objectives included acquiring information about the visitor's:

- o Length of visit;
- o Previous site use;
- o Group size;
- o Recreation activities and areas used;
- o Perceptions of crowding;
- o Opinions on the adequacy of recreation facilities;
- o Satisfaction with overall recreation experience;
- o Problems encountered, if any; and
- o Geographic origin and socio-demographic characteristics.

2.1.3 Study Area

The visitor survey was administered to recreationists at two areas: (1) West Rosebud Lake, including the parking and shoreline areas, and (2) Mystic Lake Trailhead. Visitors at the trailhead were asked questions related to their use of areas accessed from the trailhead, including the Mystic Lake Trail, Mystic Lake, and backcountry areas above the lake.

2.1.4 Population of Interest

The population of interest consisted of all recreationists aged 16 years or older who used West Rosebud Lake or the Mystic Lake Trailhead from May 24 (beginning of Memorial Day Weekend) through September 2 (Labor Day), 2019.

2.1.5 Survey Design

The visitor survey was administered as: (1) an onsite questionnaire completed by the visitor and returned to the survey technician, (2) an onsite interview, or (3) a mail-return questionnaire completed off site. Surveys were completed onsite in all cases at West Rosebud Lake and, in most cases, situations at Mystic Lake Trailhead where visitors were returning from the trail. In cases at the trailhead where visitors were embarking on their visit and therefore didn't yet have trail experiences to report, visitors were given mail survey packets that contained questionnaires and stamped, mail-return envelopes. Visitors were also given mail-return packets if they preferred to respond when they returned home.

It was assumed that most visitors using West Rosebud Lake would be engaged in their recreation activity (fishing, picnicking, etc.) when contacted by the survey technician. Even though their visit had not yet concluded, it was expected that these recreationists could accurately report aspects related to their visit, such as activities and anticipated length of stay.

Visitors contacted at the Mystic Lake Trailhead were either beginning or ending their use of the Mystic Lake Trail, and as such, only those leaving the area would be able to report area-specific aspects of their visit. In other words, while visitors beginning their trail use could report intentions and expectations, only visitors ending their visit could report actual experiences. Also, recreationists leaving the trail were, at times, tired and anxious to depart the trailhead, which made it difficult to solicit their participation in an onsite survey process at times. For these reasons, a mail-return survey packet was distributed to trailhead users beginning their trail use or eager to depart the trailhead after their trail use, instead of conducting an interview or providing a hardcopy questionnaire that was completed and returned on site.

2.1.6 Sampling Strategy

Reasonable attempts were made to include in the sample all recreationists using West Rosebud Lake or the Mystic Lake Trailhead during the sampling events. Non-recreationists (NorthWestern Energy or agency employees, contractors, etc.) were excluded.

Typically, the survey technician followed this script when approaching recreationists:

“Hello, my name is _____ and I’m conducting a recreational use survey for NorthWestern Energy in cooperation with the Forest Service. Would you mind if I asked you a few questions about your visit?”

If asked about the survey’s content or purpose, generally the following response sufficed:

“The survey will ask about your use of the area and your opinions about the conditions you encountered. Information from the study will help guide decisions about area facilities and management.”

One member of each recreation group (family or friends recreating together) was randomly chosen to participate in the survey by selecting the person (aged 16 or over) with the most recent past birthday. If the selected person chose not to participate, the survey technician chose the person with the next most recent birthday, and so on. If no one in the group agreed to participate in the study, the survey technician noted the group refusal for survey response rate calculation.

In order to acquire a diverse sample and limit the amount of participation of any one person in the study, the same person was included in the study only once at each site during the study period. For example, once a person was interviewed at any time at West Rosebud Lake, they couldn’t be interviewed at the lake again, but could be interviewed one time on a future trip to the trailhead.

2.1.7 Sampling Schedule

The primary objective of the sampling schedule was to arrive at a sample that was representative of typical recreation use during the study period (Memorial Day weekend through Labor Day weekend). A secondary objective was to cluster days to increase survey administration efficiency.

2.1.8 Survey Questionnaires

The survey questionnaires are included in *Appendices A* and *B*. Most survey questions were the same at West Rosebud Lake and the Mystic Lake Trailhead, while a few were tailored to specific recreation resources at each area.

2.2 Use Count Methods

2.2.1 Use Count Goal

The goal of the use counts was to better understand the volume of visitors using Project-related recreation resources, including West Rosebud Lake, Mystic Lake Trail, and Mystic Lake.

2.2.2 Use Count Objectives

Use count objectives were to acquire information about the number of:

- o Vehicles entering the Project area along West Rosebud Road near West Rosebud Lake;
- o Recreationists using any portion of Mystic Lake Trail above the powerhouse area; and
- o Recreationists using trails that access the backcountry above Mystic Lake.

2.2.3 Use Count Strategy

The use count methods closely replicated the strategy used in the 2005 baseline study and 2013 visitor survey, with the exception that a vehicle counter was not placed on West Rosebud Road north of Pine Grove Campground (as it was in 2005). Using similar counter locations to previous years allowed use volumes to be compared between the study years.

NorthWestern Energy placed a vehicle counter along West Rosebud Road near the turnoff to the Project's dam at the outlet of West Rosebud Lake (Figure 1). Because this location is adjacent to West Rosebud Lake, which is the first Project-related recreation resource encountered along the road, these vehicle counts served as a proxy for total recreation use in the Project area. Data collected by this counter could be examined by day, week, month, hour of the day, etc.

NorthWestern Energy also placed a trail counter on the Mystic Lake Trail on the footbridge over the penstock. This counter captured all Mystic Lake trail traffic.

The Forest Service placed, monitored and retrieved two counters on trails leading from Mystic Lake to the surrounding backcountry. NorthWestern Energy supplied counters to the Forest Service for this work. Both the Phantom Creek and the Huckleberry Creek trail counters were sited several hundred feet up the trails from the lake. The counter intended for the Island Lake Trail was mistakenly placed along Mystic Lake trail not far from the bridge over the penstock, so use of the Island Lake Trail was, unfortunately, not monitored.

In addition to determining the amount of use of each of the trail segments, the network of trail counters was intended to show how much Mystic Lake Trail use is associated with Mystic Lake as a potential final destination versus the higher backcountry as the destination.

3 Visitor Survey Results

3.1 Response Rates and Sample Sizes

Visitor response to the recreation visitor survey was excellent. Because surveys were administered both onsite and as mail-return questionnaires, response rates for both survey formats were tracked. Of the 406 visitors intercepted at the sites and asked to participate in the survey, 85% complied (Table 1). Seventy-two trailhead participants opted for the mail-return option, and 56% of those were completed and returned. The overall response rate of 85% suggests that any error in study results related to non-response bias was minimal.

In total, 344 surveys were completed (Table 2). Eighty-eight percent were completed onsite and 12% were returned through the mail. All mail-return surveys were administered at the trailhead. Sample sizes at West Rosebud Lake, Mystic Lake Trailhead and both sites combined (145, 199 and 344 respectively) were sufficient to provide reasonable statistical confidence in results.²

Table 1. Response Rates by Survey Type and Site

Survey Source	West Rosebud Lake	Mystic Lake Trailhead	Both Sites
On-Site Survey	95%	87%	91%
Mail-Return Survey	No mail-return surveys distributed	56%	56%
Total	95%	78%	85%

Table 2. Completed Surveys by Survey Type and Site

Survey Source	West Rosebud Lake		Mystic Lake Trailhead		Both Sites	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
On-Site Survey	145	100%	159	80%	304	88%
Mail-Return Survey	0	0%	40	20%	40	12%
Total	145	100%	199	100%	344	100%

² For binomial random variables (e.g., the proportion of visitors that participate in an activity or were first-time visitors), at the worst case where $p=0.5$, we are 90% confident that the true proportion is $\pm 6.8\%$ at West Rosebud Lake, $\pm 5.8\%$ at Mystic Lake Trailhead, and $\pm 4.5\%$ at both sites combined.

3.2 Notes on Interpreting Results

Repeat site use by visitors was not recorded because visitors were sampled only once at each site over the course of the study period.³ As such, to some degree, results may under report site use associated with frequent site visitors, such as some area residents or others that visit the same site many times over the season.

Results from the previous visitor survey conducted in 2013 are sometimes included in the discussion for informational purposes. The 2013 and 2019 visitor studies targeted the same population of visitors (those at West Rosebud Lake and the Mystic Lake Trailhead) and were guided by the Recreation Plan and consultations with the US Forest Service.

³ Sampling visitors only once ensures that a repeat visitor is not unduly disturbed or burdened by a repeat request for survey participation.

3.3 Visitor Characteristics

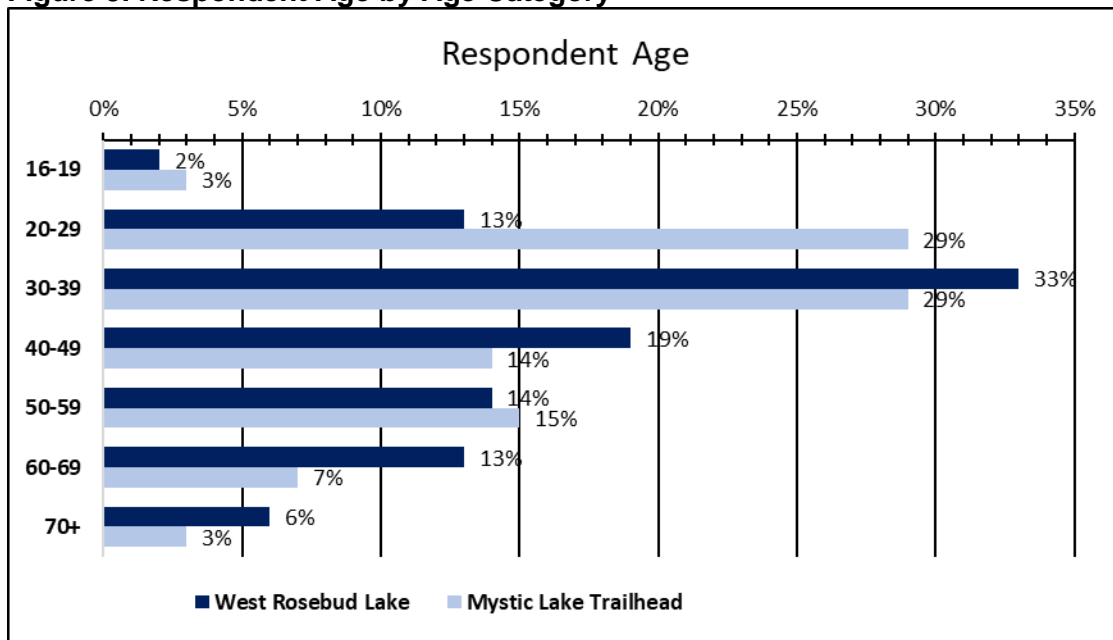
Overall, 62% of site visitors were male and 38% were female (Table 3). The proportion of males was slightly higher at Mystic Lake Trailhead than West Rosebud Lake (64% vs. 59%). These proportions are very similar to those captured by the 2013 visitor survey.

Table 3. Visitor Gender by Site

	West Rosebud Lake	Mystic Lake Trailhead	Both Sites
Male	59%	64%	62%
Female	41%	36%	38%

The median age of visitors (aged 16 years or older) was 38 years, slightly younger than the median age of 40 in 2013. Visitors at West Rosebud Lake were slightly older, overall, than trailhead visitors (median ages of 41 and 37 respectively). Sixty-one percent of trailhead visitors were under age 40 in 2019, compared to 53% of trailhead visitors in 2013. Forty-eight percent of West Rosebud Lake visitors were under age 40 in 2019, compared to 45% in 2013 (Figure 3). Trailhead visitors in their twenties were more prominent in 2019 than in 2013, with this proportion of the visitor population growing from 23% in 2013 to 29% in 2019. Likewise, visitors in this age bracket at West Rosebud Lake declined from 21% in 2013 to 13% in 2019. Visitors in their thirties were more common at both sites in 2019 compared to 2013.

Figure 3. Respondent Age by Age Category



Overall, 87% of visitors lived in Montana, with Mystic Lake Trailhead attracting more out-of-state visitors than West Rosebud Lake (19% vs 5%, Table 4). The majority of trailhead users (53%) and West Rosebud Lake visitors (57%) came from Yellowstone County, principally from Billings. Similar proportions resulted from the 2013 study, when 87% of visitors were from Montana and 60% were from Yellowstone County.

Table 4. Visitor Origin by Site

	West Rosebud Lake	Mystic Lake Trailhead	Both Sites
Yellowstone Co.	57%	53%	55%
Stillwater Co.	13%	6%	9%
Carbon Co.	8%	4%	5%
Gallatin Co.	8%	9%	8%
Other Montana Co.	9%	10%	9%
Out-of-State	5%	19%	13%

Overall, 60% of visitors had previous experience at the site (Table 5), down 9% from the 2013 study. First-time visitors were more common at Mystic Lake Trailhead than West Rosebud Lake (47% vs. 29%), and the proportion of first-time visitors increased 9% at West Rosebud Lake, 8% at Mystic Lake Trailhead, and 8% overall between 2013 and 2019.

Table 5. Visitor Site Experience by Site

	West Rosebud Lake	Mystic Lake Trailhead	Both Sites
Repeat Visitor	71%	53%	60%
First Time Visitor	29%	47%	40%

Visitors with past experience at Mystic Lake Trailhead had been visiting for a median of 9 years and made 2 visits per year. West Rosebud Lake visitors with previous site experience had visited for 14 years and made 3 trips per year. These results are similar to 2013, when recreationists had visited the area for ten years and made 1-2 trips per year.

3.4 Trip Characteristics

The average group size was relatively small, with a median size of 3 people (Table 6). Groups tended to be slightly larger at West Rosebud Lake (median group size of 3 people) than Mystic Lake Trailhead (median group size of 2 people). The median group size was also 3 people in the 2013 survey.

Table 6. Group Size by Site

Group Size	West Rosebud Lake		Mystic Lak Trailhead		Both Sites	
	Percent	Cumulative Percent	Percent	Cumulative Percent	Percent	Cumulative Percent
1	6%	6%	15%	15%	11%	11%
2	37%	43%	40%	55%	39%	50%
3	16%	59%	15%	70%	15%	65%
4	19%	78%	14%	84%	16%	81%
5	7%	85%	7%	91%	7%	88%
6	7%	92%	3%	94%	5%	93%
7 or more	8%	100%	6%	100%	7%	100%

The median length of stay for visitors at West Rosebud Lake was 4 hours (compared to 5 hours in 2013). At Mystic Lake Trailhead, day hikers accounted for 65% of users and spent 5 hours on the trail. Overnight backpackers comprised 35% of visitors and were typically out for 1 night. Compared to 2013 results, there was a 12% shift from day use to overnight use for trail users (i.e. the proportion of day users decreased by 12% while overnight users increased by 12%) though the day use length of stay was 1 hour shorter in 2019 than in 2013 and the nights spent decreased from 2 nights in 2013 to 1 night in 2019.

Only 5% of Mystic Lake Trail users reported not reaching the Mystic Lake overlook / dam area (Table 7). Nearly half (48%) reported reaching the trail along Mystic Lake and 39% reported using trails that lead to the backcountry above the lake. By comparison, only 25% of users reported using trails that lead to the backcountry above the lake in 2013.

Table 7. Travel Along Mystic Lake Trail

Point Along Mystic Lake Trail	Farthest Point Reached
Trails leading to backcountry above lake	39%
Trail along Mystic Lake	48%
Mystic Lake overlook / dam area	8%
Between powerhouse and Mystic Lake (didn't reach lake)	4%
Powerhouse / employee camp area	1%

Overall, about one-quarter (27%) of visitors stayed overnight at Emerald Lake or Pine Grove Campground during their trip (Table 8). West Rosebud Lake visitors were about three times as likely as trailhead users to have stayed at one of these campgrounds (43% vs. 15%). A slightly smaller portion of visitors stayed at one of the campgrounds in 2019 compared to 2013, when 35% of all visitors stayed.

Table 8. Stayed Overnight at Emerald Lake or Pine Grove Campground

	West Rosebud Lake	Mystic Lake Trailhead	Both Sites
Yes	43%	15%	27%
No	57%	85%	73%

3.5 Recreation Activities

When visitors were asked about participation in a list of recreation activities they engaged in at West Rosebud Lake or on the Mystic Lake Trail, viewing scenery was very popular, with 65% participating at the lake and 82% up the trail (Table 9). These levels of participation are similar to those reported in 2013.

Fishing from the shoreline of West Rosebud Lake appears to have grown in popularity since 2013, with an increase of 41% (from 36% in 2013 to 77% in 2019). However, development of parking areas, installation of a boat ramp, and construction of a handicap-accessible fishing pier were underway at West Rosebud Lake during the 2013 study. These construction activities restricted public use of those areas periodically throughout the 2013 study period. Therefore, the 2019 activity results, especially as they relate to fishing, are more typical of actual visitor activities since public access was unrestricted in 2019.

Picnicking decreased 8% at West Rosebud Lake and 6% for trailhead users since 2013, and walking/hiking at the lake decreased as well (down 16% from 51% in 2013 to 35% in 2019).

When given an opportunity to report participation in other activities, 11% of trailhead users listed other pursuits.⁴ Almost half (45% of these respondents or 5% of all trailhead users) listed photography, and about a quarter (27% of these respondents or 3% of all trailhead users) listed mountain climbing.

Table 9. Activity Participation by Survey Site Location

Activity	West Rosebud Lake	Mystic Lake Trailhead
Fishing (of any type or method)	81%	40%
Fishing from Shore	77%	--
Fishing from Watercraft	12%	--
Non-Motorized Boating	21%	--
Picnicking	43%	33%
Viewing Scenery	65%	82%
Nature Study / Viewing Wildlife	6%	16%
Walking / Hiking	35%	100%
Other	6%	16%

⁴ Because respondents had to take action to list these activities, the true proportion participating in other activities is probably higher.

Visitors that participated in fishing were asked which streams or lakes they fished. Overall, West Rosebud Lake and Mystic Lake were the most popular waterbodies (Table 10). Visitors to West Rosebud Lake had primarily fished West Rosebud Lake, but also Emerald Lake and West Rosebud Creek in some cases. Mystic Lake Trailhead visitors most often fished at Mystic Lake, but also Island Lake and other waterbodies (such as Silver Lake and Huckleberry Creek).

Table 10. Lake or Stream Fished

Lake or Stream	West Rosebud Lake	Mystic Lake Trailhead	Both Sites
West Rosebud Lake	83%	3%	48%
Emerald Lake	10%	2%	6%
Mystic Lake	2%	58%	26%
Island Lake	--	26%	11%
West Rosebud Creek	5%	3%	4%
Other	--	8%	5%

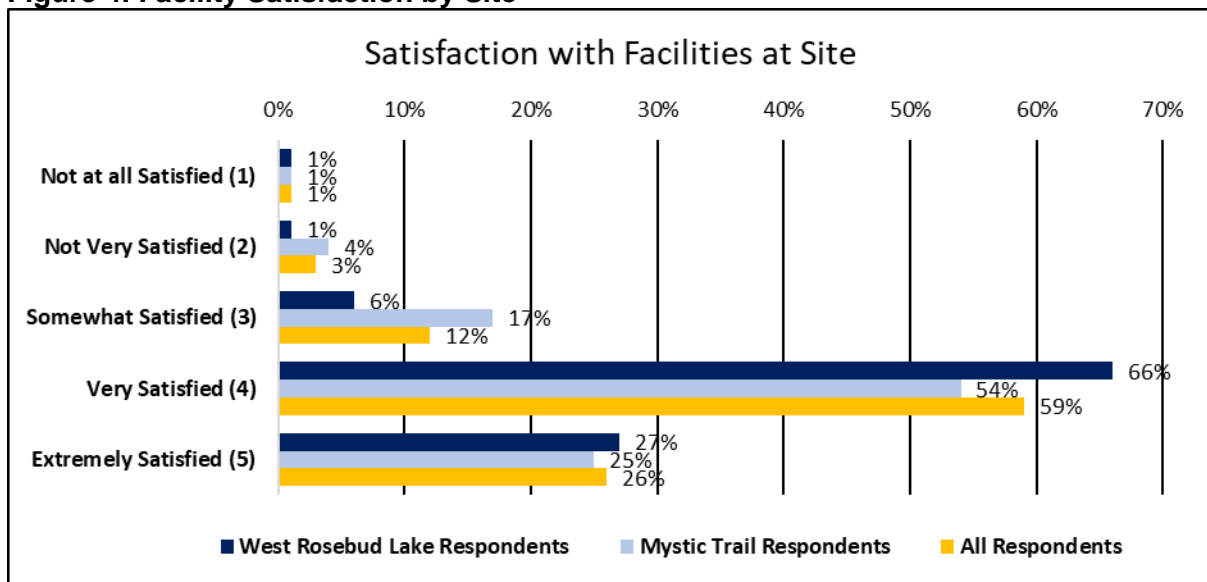
3.6 Facility Satisfaction

Visitors were asked to rate their satisfaction with the number, type and condition of recreational facilities at the site they were visiting (West Rosebud Lake or Mystic Lake Trailhead), using a five-point ordinal scale.

Visitors were generally satisfied with facilities, with 85% of visitors to both sites reporting being “very” or “extremely” satisfied (Figure 4). Visitors to West Rosebud Lake were slightly more satisfied with site facilities than Mystic Lake Trailhead visitors, with lake visitors reporting an average of 4.2 on the 1-5 scale compared to an average of 3.98 on the 1-5 scale by trailhead visitors. Only two percent of West Rosebud Lake visitors and 5% of trailhead visitors were “not at all” or “not very” satisfied with the facilities. Satisfaction with facilities was very similar to results from the 2013 visitor survey.

Visitors who were dissatisfied with site facilities were asked the reason for their dissatisfaction. The vast majority of reasons for low levels of satisfaction at both sites were related to the condition of the restrooms. Dissatisfied visitors noted that restrooms were smelly, unclean, or lacked toilet paper. Some also felt that additional bathroom facilities were needed. Lack of parking was an additional source of dissatisfaction at the trailhead as well.

Figure 4. Facility Satisfaction by Site



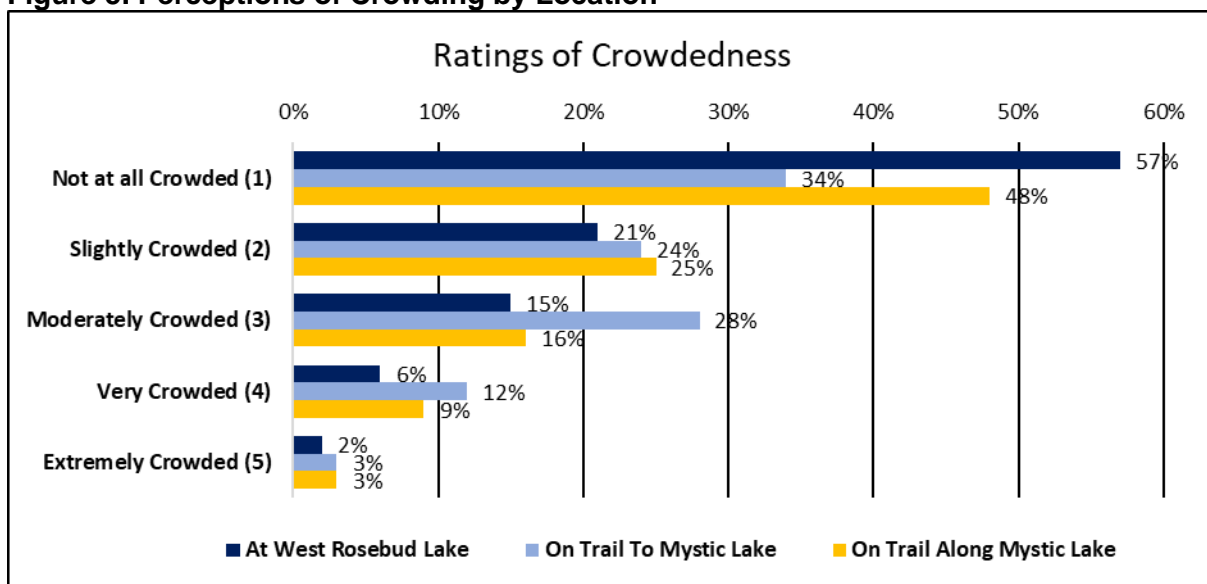
3.7 Crowding

Visitors were asked about their perceptions of crowding and provided ratings using a five-point ordinal scale. West Rosebud Lake visitors were asked about crowding at West Rosebud Lake, and trailhead users were asked about crowding on the trail *to* Mystic Lake, and if they reached it, the trail *along* Mystic Lake (Figure 5).

Trail users rated the trail *to* Mystic Lake as more crowded than the trail *along* the lake (43% vs. 28% rated it as “moderately” to “extremely” crowded), which is not surprising since only about half of the trail users made it to the trail along Mystic Lake (48%, Table 7), so there were fewer people there than there were on the trail *to* Mystic Lake. More than three-quarters (78%) of West Rosebud Lake visitors rated the lake as “not at all” or “slightly” crowded.

Crowding at West Rosebud Lake was very similar to 2013, with the average visitor rating on the 1-5 scale increasing from 1.75 to 1.77 in the six-year interval. Ratings of crowdedness on the trail, however, increased (i.e. worsened) even more, with the average rating on the trail *to* Mystic Lake increasing from 1.95 to 2.26 during the six-year interval, and the average for the trail *along* Mystic Lake increasing from 1.67 to 1.95.

Figure 5. Perceptions of Crowding by Location



3.8 Problems

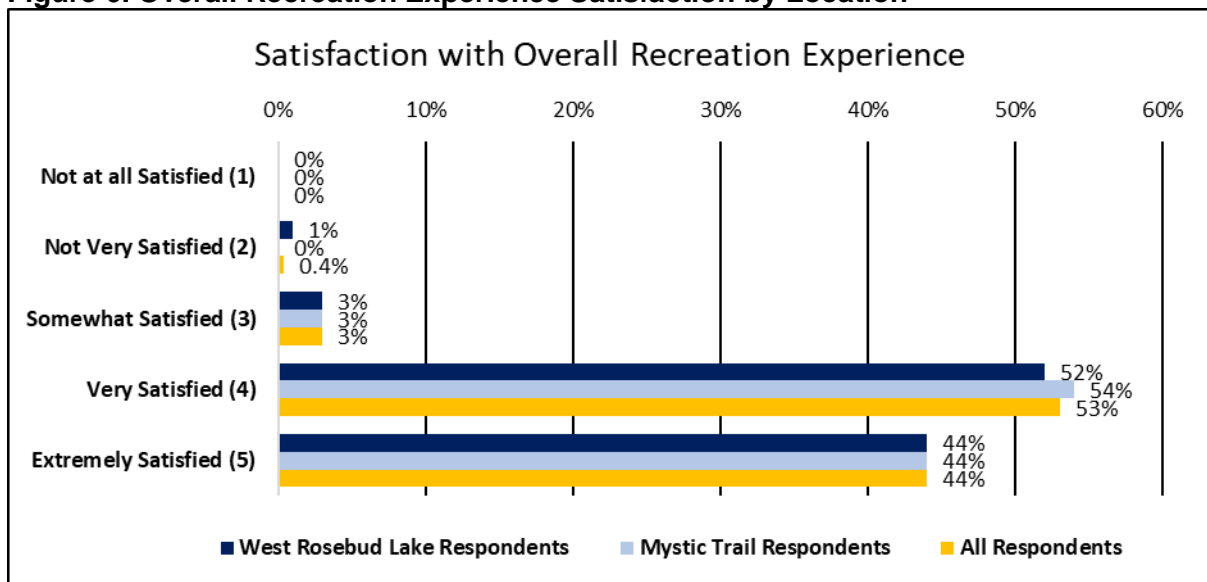
Ten percent of visitors reported experiencing problems at West Rosebud Lake, and 8% reported problems at Mystic Lake Trailhead or on the trail. These results were very similar to the 2013 study.

Fifteen percent of trailhead users reporting problems noted a need for additional trash cans or trash pick-up, while another 15% reported there were too many dogs on the trail. Ten percent reported encountering dog waste on the trail and another 10% reported poor bathroom conditions. Thirty-six percent of West Rosebud Lake visitors reporting problems complained of road conditions on West Rosebud Road, while 18% mentioned trash or litter problems and 18% reported unattended campfires (assumedly at Emerald Lake or Pine Grove campgrounds).

3.9 Overall Satisfaction

Visitors were asked to rate their overall satisfaction with their experience on the Mystic Lake Trail or at West Rosebud Lake, using a five-point ordinal scale. Overall, visitors were very satisfied with their experience, with 98% of trail users and 96% of West Rosebud Lake visitors reporting being “very” or “extremely” satisfied (Figure 6). Only 1% of West Rosebud Lake visitors were “not at all” or “not very” satisfied with their experience. These ratings were slightly more positive in 2019 than in 2013.

Figure 6. Overall Recreation Experience Satisfaction by Location



3.10 Comments

At the end of the survey visitors were given an open-ended opportunity to communicate other information they felt managers should know about the recreation opportunities.

Overall, 38% of all respondents provided comments. One-third of those comments (33%) were expressions of how much they liked the area and/or its recreation opportunities. Another third (33%) expressed a need to improve or repair West Rosebud Road. The remaining comments pertained to specific issues but in low occurrences (1% - 4% each), such as conflicts with dogs, other users, or dog waste; the need for additional signage; more parking, shade structures, or fishing platforms.

4 Visitor Use Count Results

Visitor use counts were collected during the 2019 visitor study through automated counters. A vehicle counter collected counts on West Rosebud Road immediately northeast of West Rosebud Lake and three trail counters were installed to monitor use on the trail to Mystic Lake and trails to backcountry destinations above the lake.

The vehicle counter captured some administrative use – such as US Forest Service personnel or NorthWestern Energy staff - and this use was estimated and removed from the total counts so that resulting data only describe recreational use of the roadway. Because counting vehicles using the access road is easier than counting recreationists dispersed throughout recreation sites, using vehicles as proxies for recreationists is a cost-efficient and widely-adopted method for estimating site use. Vehicle counts also provide insight into visitor use patterns such as volume and timing of visitation. Also, visitation estimates can be calculated based on vehicle occupancy assumptions or recreation visitor group size.

Trail counters were placed at: (1) Mystic Lake Trail on the lower footbridge (over the penstock), (2) Phantom Creek Trail from Mystic Lake toward the Froze to Death Plateau, and (3) Huckleberry Creek Trail from Mystic Lake up Huckleberry Creek. Trail counters captured individual visitors as they walked past the infrared eye (instead of groups, like the vehicle counter). Administrative use of the trail system (by US Forest Service personnel and others) was estimated and removed from the counts so that the resulting data only reflects visitor use.

While daily use counts demonstrate daily fluctuations in use of these areas along with general characteristics, weekly counts offer a perspective of site use that is a bit broader in scope and demonstrates fluctuations in use over the course of the season. Therefore, each set of counter data that was collected in 2019 is provided on a daily basis as well as a weekly basis. To arrive at weekly counts, daily counts were combined for each Thursday-Wednesday interval. While a week is generally thought to start on Sunday or Monday, using Thursday as the starting day of each week captures visitors that venture into the backcountry for overnight trips both on their inbound trip in and on their outbound trip within the same data point so that the resulting analysis most accurately reflects use. Starting the week during the weekend would capture some inbound trail use in one week's data and the associated outbound trail use in another week's data.

Vehicle and trail counters captured all use and thus counted each vehicle or individual as they entered and left the area, but final data were adjusted to remove double-counting and reflect actual visitor volume. Data charted in this section only reflect collected data (from mid-June through early September), while estimates of total use of the peak recreation season (Memorial Day weekend through Labor Day) are provided in Table 11.

Table 11. 2019 Visitor Use Counts Summary

Counter Location	Total Visitation	% Change vs 2013	% Weekend Use	% Weekday Use
West Rosebud Road	7,419 groups	+12%	53%	47%
Mystic Lake Trail	9,275 visitors	+45%	59%	41%
Phantom Creek Trail	748 visitors	+23%	42%	58%
Huckleberry Creek Trail	381 visitors	+17%	47%	53%

4.1 West Rosebud Road

A vehicle counter was installed to monitor traffic on West Rosebud Road immediately before the turnoff to the Project’s dam at West Rosebud Lake. Recreationists passed the counter as they drove to recreation sites along West Rosebud Lake and/or to the Mystic Lake Trailhead.

The vehicle counter acquired counts from June 14 to September 2 (Labor Day) and counts for Memorial Day weekend through June 13 were estimated. Over the peak recreation season, a total of 7,419 recreation groups utilized West Rosebud Road, an average of 78 groups per day and a 12% increase compared to 2013. Slightly more than half of the trips (53%) occurred on weekends while the remaining trips (47%) occurred on weekdays. Ultimately, approximately 40% of visitor traffic on the road translated into trail use, while 60% of the visitor groups utilized West Rosebud Lake.

Use of the road peaked on weekends throughout the summer, with highest use days occurring on July 6 with 221 groups and July 13 with 215 groups (Figure 7). Use was a bit low June 20-24, August 16-18, and the third week of August due to inclement weather (see section 3.1).

The week (Thursday-Wednesday) with the highest visitation on West Rosebud Road was July 11-17 with 693 groups, followed by August 1-7 with 679 groups (Figure 8). The impact of low temperatures during the third week of August is easier to visualize on the weekly analysis than on the daily analysis.

Figure 7. West Rosebud Road Daily Visitation, June 14 - Sept 2, 2019

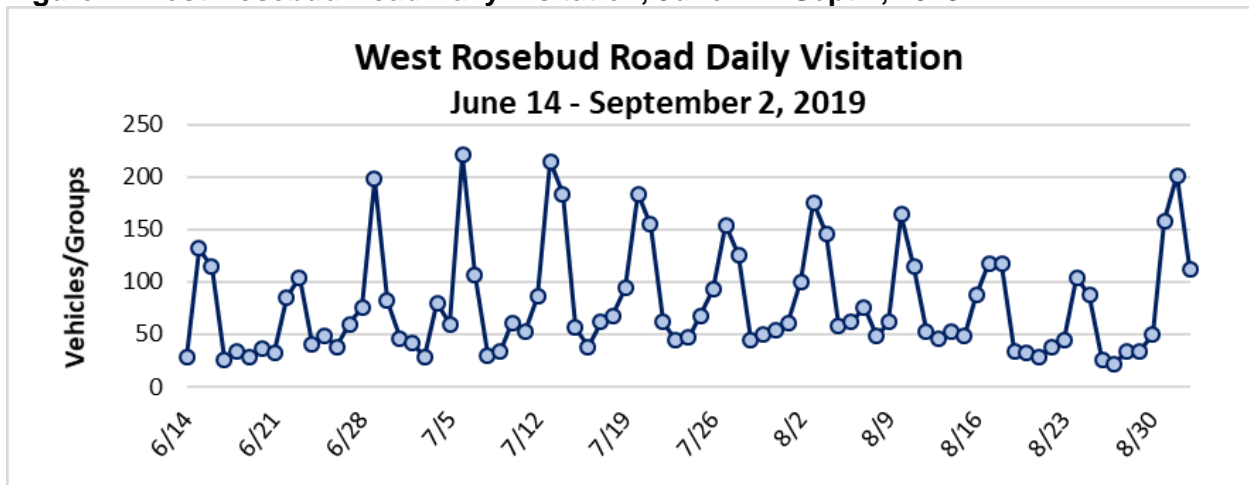
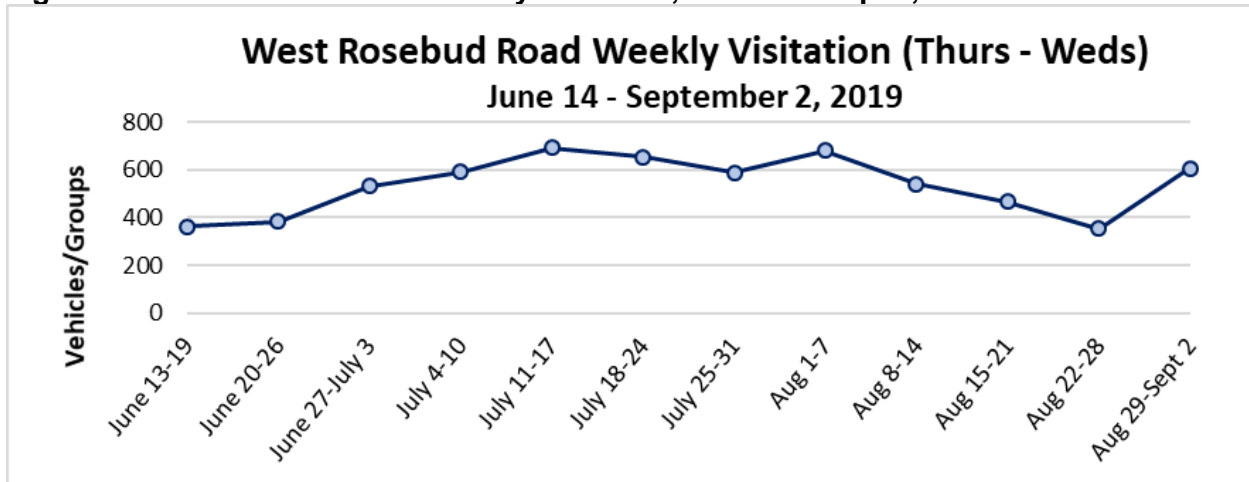


Figure 8. West Rosebud Road Weekly Visitation, June 14 - Sept 2, 2019



4.2 Mystic Lake Trail

Use of the Mystic Lake Trail was collected for June 14 - September 2 and estimated for Memorial Day weekend through June 13. A total of 9,275 recreationists used the Mystic Lake Trail during the peak recreation season, an average of 104 people per day and a 45% increase compared to 2013. Weekend use accounted for 59% of trail use, while weekday use accounted for 41%. Peak use occurred on July 20 with 357 visitors (Figure 9).

The highest week-long visitation was recorded the week of July 18-24 (Thursday-Wednesday), when 925 visitors used the Mystic Lake Trail (Figure 10). Cool temperatures created low trail use the week of August 22-28 (see section 3.1).

Figure 9. Mystic Trail Daily Visitation (at bridge over tram), June 14 - Sept 2, 2019

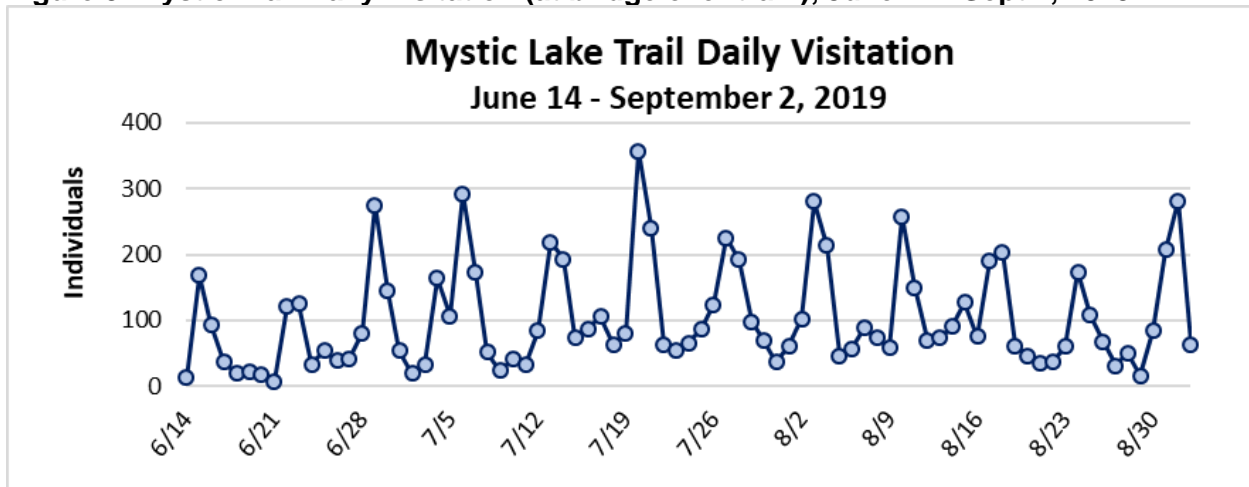
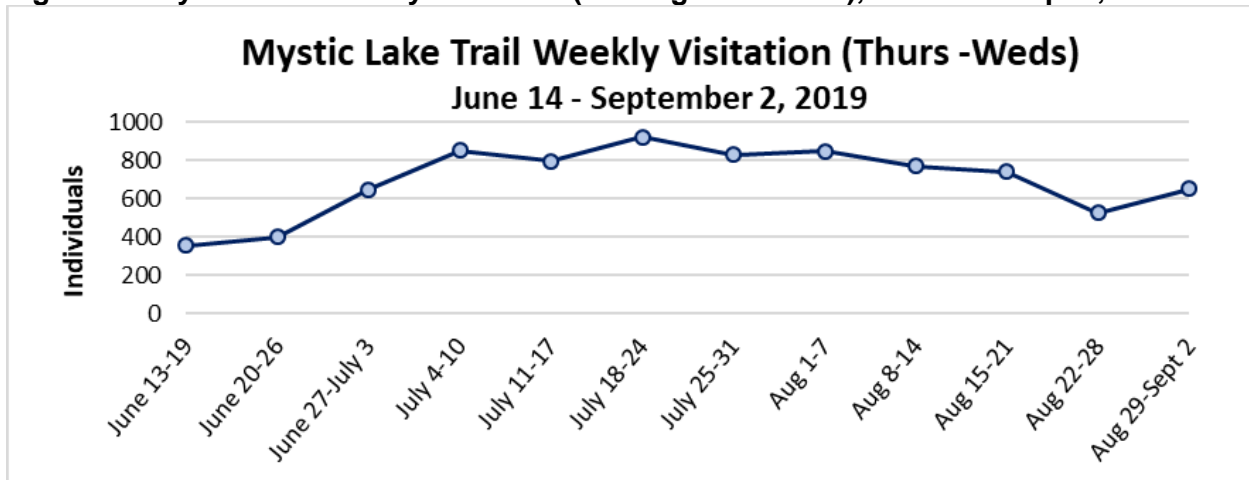


Figure 10. Mystic Trail Weekly Visitation (at bridge over tram), June 14 - Sept 2, 2019



4.3 Phantom Creek Trail

Use of the Phantom Creek Trail was collected for June 23-September 2 and estimated for Memorial Day weekend through June 22. A total of 748 visitors used the Phantom Creek Trail over the course of the peak recreation season in 2019, an increase of 23% compared to 2013. Weekend visitation accounted for 42% of all use while weekday visitation accounted for 58%. Likely due to persisting snow, use of the Phantom Creek Trail really did not pick up until late July (Figure 11). Peak use occurred on August 2 and again on August 31, when 40 visitors utilized the trail each day. High use was also recorded on July 26 and August 17, with 34 visitors each day. August 1-7 had the highest week-long visitation level of the season, with 132 visitors using the trail that week (Figure 12).

Figure 11. Phantom Creek Trail Daily Visitation, June 23 - Sept 2, 2019

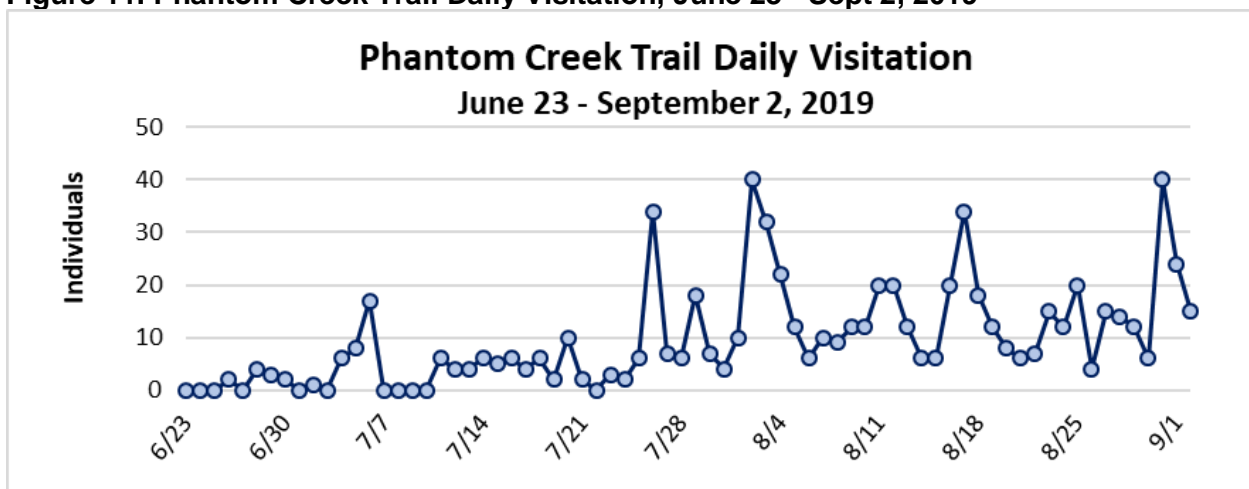
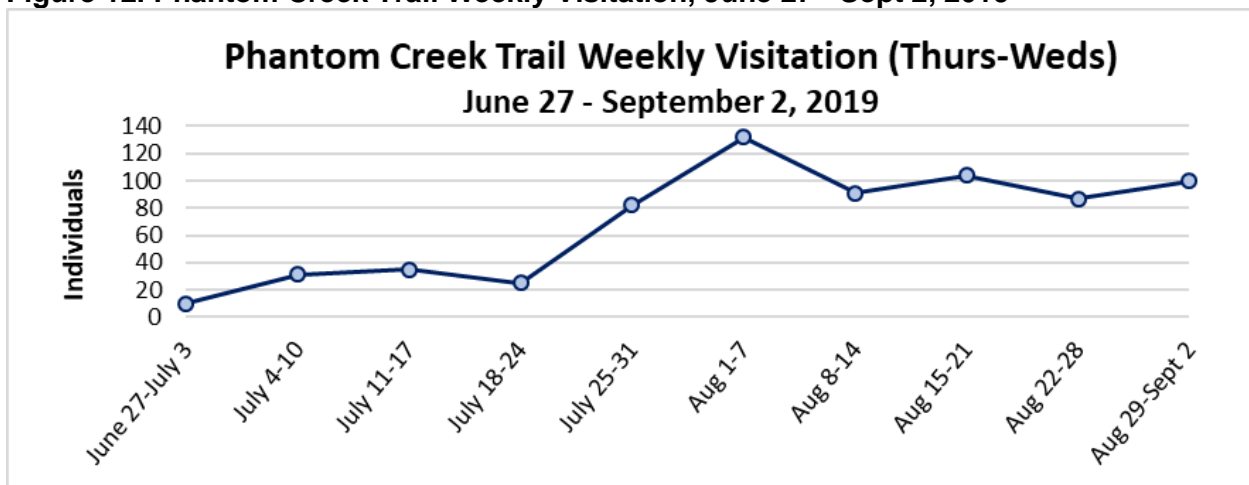


Figure 12. Phantom Creek Trail Weekly Visitation, June 27 - Sept 2, 2019



4.4 Huckleberry Creek Trail

Use of the Huckleberry Creek Trail was collected for June 23-September 2 and estimated for Memorial Day weekend through June 22. Peak use of the Huckleberry Creek Trail occurred on August 12 (32 visitors), July 27 (29 visitors), and July 6 (24 visitors, Figure 13). A total of 381 recreationists utilized the trail during the peak recreation season of 2019, an increase of 17% compared to 2013 and an average of 4.8 people per day. Weekend use accounted for 47% of all visitation while weekday use accounted for 53%. The highest week-long visitation was recorded on August 1-7 when 61 visitors used the Huckleberry Creek Trail, though the preceding two weeks were not far behind with 56 visitors each (Figure 14).

Figure 13. Huckleberry Creek Daily Visitation, June 23 - Sept 2, 2019

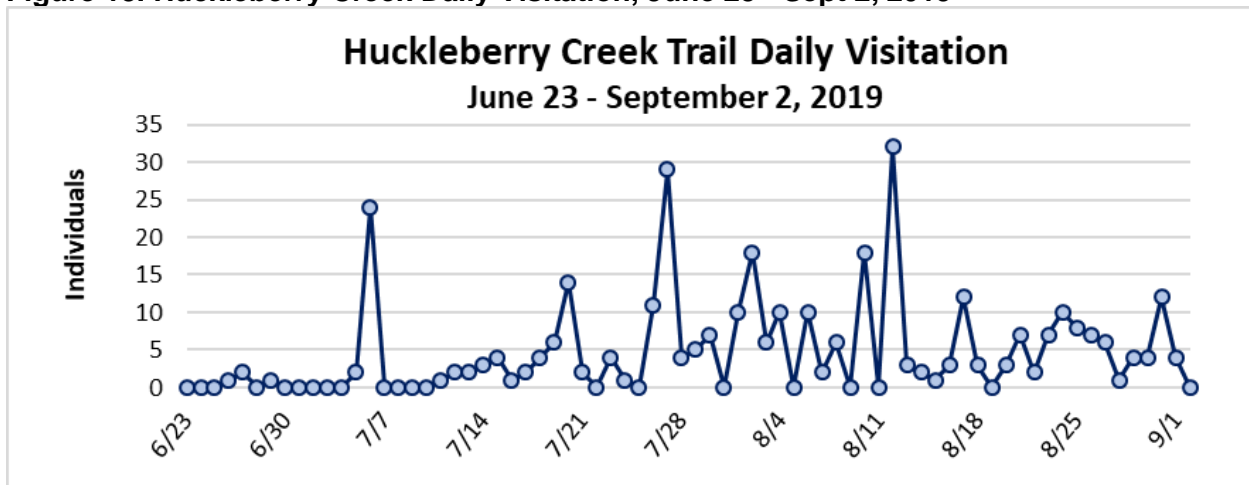
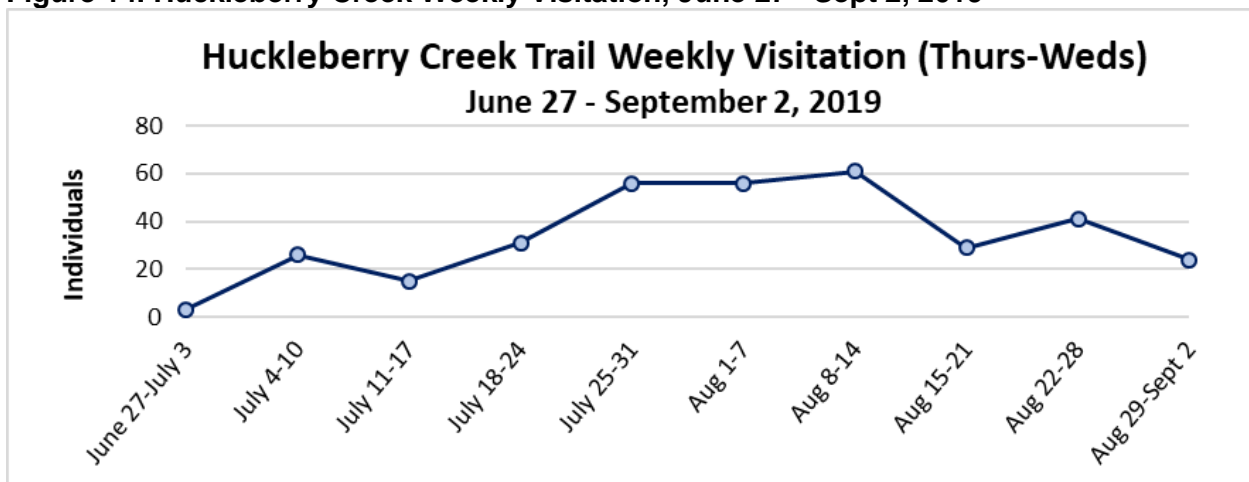


Figure 14. Huckleberry Creek Weekly Visitation, June 27 - Sept 2, 2019



5 Results Overview and Discussion

The number of visitors on the Mystic Lake Trail increased 45% from 2013 to 2019, and most of that increase occurred on weekends. This weekend increase maintained a pattern of low weekday use and high weekend use, but also contributed to higher ratings of crowdedness on the trail to Mystic Lake and the trail along Mystic Lake compared to 2013. However, despite higher ratings of crowding on the trail, overall satisfaction ratings remained very high in 2019. Since ratings of crowdedness and satisfaction are, at least to some extent, tied to expectations of seeing or hearing other users, the high satisfaction ratings amongst increased ratings of crowdedness demonstrate that visitors continued to find the experience they sought out and expected on the Mystic Lake Trail in 2019.

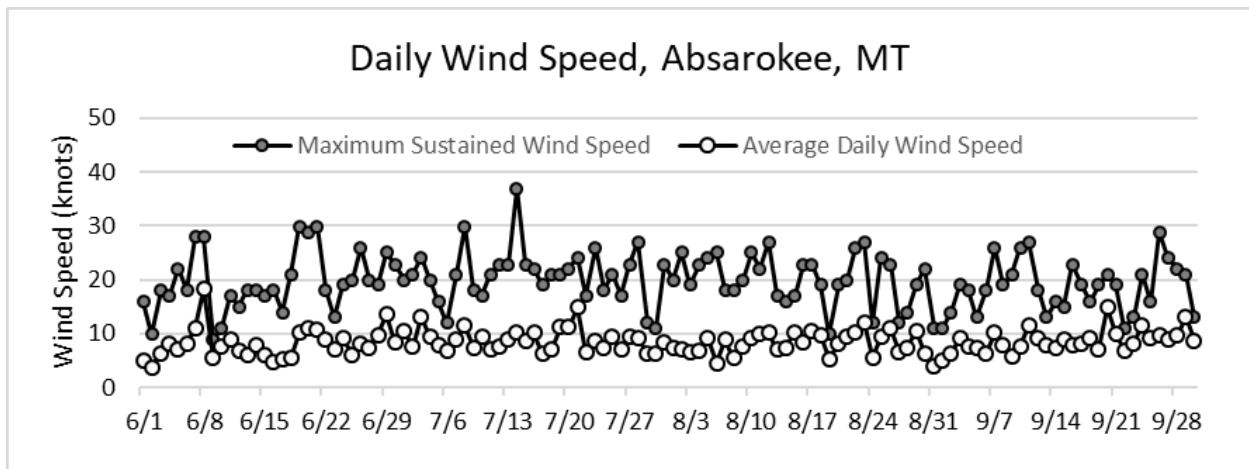
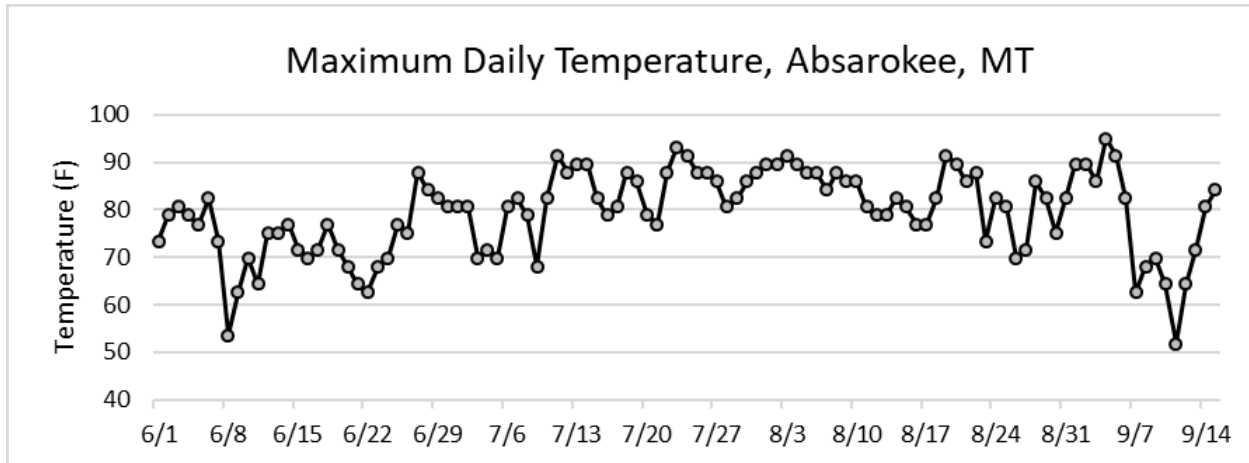
Trail users ventured further into the backcountry in 2019, and first-time visitors were more common. This is likely influenced by information made readily available on social media. In spite of how far the social media reach is, though, more than half of the visitors to the trail were “locals” from Yellowstone County and 8 in 10 were from Montana, proportions that were consistent with the 2013 study. Overnight stays at Mystic Lake or areas beyond were also more common by trail users in 2019 than in 2013, and managers should be watchful for increased resource impacts in the backcountry areas.

While dissatisfaction with recreation facilities was not common, concerns expressed by some trail visitors related to availability of trash receptacles, litter pick up, and restroom conditions, which may have simple management solutions. By contrast, conflicts that some users have with dogs and dog waste on the trail, as well as lack of parking at the trailhead, may be a bit more challenging to manage.

Patterns of use at West Rosebud Lake remained fairly consistent between 2013 and 2019, with high use occurring on weekends. While use increased somewhat at West Rosebud Lake, ratings of crowdedness decreased. This decrease may be at least partially due to the construction of the boat launch and accessible fishing facilities in 2013, which are now fully utilized by visitors. While satisfaction was high amongst users, concerns over restroom conditions at West Rosebud Lake were expressed by some visitors, and the poor condition of West Rosebud Road caused some grief for recreationists.

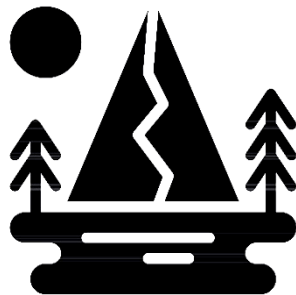
6 Weather Data

The weather data below describe the temperature and wind conditions each day in the West Rosebud Lake area. Unfortunately, precipitation information is not available.



Appendix A: West Rosebud Lake Survey Questionnaire

West Rosebud Lake 2019 Recreation Visitor Survey



This survey is conducted by NorthWestern Energy, with cooperation by the US Forest Service, to gather visitor use information and gauge satisfaction with West Rosebud Lake public recreation facilities.

Date: _____ Time: _____ am / pm

1. How many people are in your group? _____
2. Is this your first visit to West Rosebud Lake?
 Yes No → Go to 2a and 2b
 - 2a. On average, how many times do you visit West Rosebud Lake each year? _____ Times
 - 2b. About how many years have you been visiting West Rosebud Lake? _____ Years
3. How much time will you spend at West Rosebud Lake on this visit? _____ Hours
4. What activities did you participate in at West Rosebud Lake?
(check all that apply)

<input type="checkbox"/> Fishing from shore	<input type="checkbox"/> Walking/hiking
<input type="checkbox"/> Nonmotorized boating	<input type="checkbox"/> Viewing scenery
<input type="checkbox"/> Fishing from a watercraft	<input type="checkbox"/> Picnicking
<input type="checkbox"/> Nature study / viewing wildlife	
<input type="checkbox"/> Other <i>(please specify)</i> _____	

5. If you fished today, what lake(s) or stream(s) did you fish?

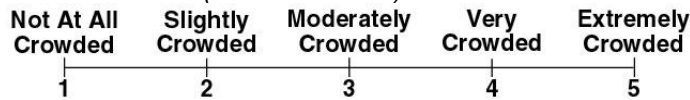
5a. How many total hours have you fish so far today? _____

5b. How many fish have you caught and released or harvest so far today?
_____ # fish caught and released

_____ # fish harvested

6. How crowded did you feel at West Rosebud Lake?

(circle a number)



7. How satisfied are you with the number, type and condition of facilities at West Rosebud Lake? (circle a number)



7a. If not at all or not very satisfied, please tell us why:

8. How satisfied are you with your overall recreation experience at West Rosebud Lake? (circle a number)



8a. If not at all or not very satisfied, please tell us why:

9. Did you experience any problems at West Rosebud Lake?

_____ No

_____ Yes → What were the problems? (please specify)

10. On this trip, did you stay overnight at Emerald Lake or Pine Grove Campground?

_____ Yes

_____ No

11. Where do you live? (city/town and state or country)

12. What is your gender?

_____ Male

_____ Female

13. What is your age? _____

14. Finally, is there anything else we should know about the recreational opportunities here?

THANK YOU, WE APPRECIATE YOUR TIME!

Appendix B: Mystic Lake Trailhead Survey Questionnaire

Mystic Lake Trailhead 2019 Recreation Visitor Survey



This survey is conducted by NorthWestern Energy with cooperation by the US Forest Service to gather visitor use information and gauge satisfaction with Mystic Lake Trailhead facilities and trail.

Date: _____ Time: _____ am / pm

1. How many people are in your group? _____
2. Was this your first visit to the Mystic Lake Trail?
 _____ Yes _____ No → Go to 2a and 2b
 - 2a. On average, how many times do you visit the trail each year? _____ Times
 - 2b. About how many years have you been visiting the trail? _____ Years
3. How much time did you spend on your visit after you left the trailhead?
 _____ Hours (day-use only) **or** _____ Nights (overnight use)
4. How far from the trailhead did you go? (*check farthest point*)
 - _____ Footbridge over tram
 - _____ Between tram and Mystic Lake (didn't reach lake)
 - _____ Mystic Lake overlook/dam area
 - _____ Trail along Mystic Lake
 - _____ Trails leading to backcountry above Mystic Lake

5. Other than hiking, what activities did you participate in while you were up the trail? *(check all that apply)*
- Fishing Viewing scenery
- Picnicking Nature study / viewing wildlife
- Other *(please specify)* _____

6. If you fished, what lake(s) or stream(s) did you fish?
- _____
- 6a. How many total hours did you fish? _____

6b. How many fish did you catch and release or harvest?

_____ # fish caught and released _____ # fish harvested

7. How crowded did you feel **on the trail to** Mystic Lake? *(circle a number)*
- | | | | | |
|-----------------------|---------------------|-----------------------|-----------------|----------------------|
| Not At All
Crowded | Slightly
Crowded | Moderately
Crowded | Very
Crowded | Extremely
Crowded |
| 1 | 2 | 3 | 4 | 5 |

- 7a. If you reached Mystic Lake, how crowded did you feel **on the trail along** the lake? *(circle a number)*
- | | | | | |
|-----------------------|---------------------|-----------------------|-----------------|----------------------|
| Not At All
Crowded | Slightly
Crowded | Moderately
Crowded | Very
Crowded | Extremely
Crowded |
| 1 | 2 | 3 | 4 | 5 |

8. How satisfied are you with the number, type and condition of facilities **at the trailhead**? *(circle a number)*
- | | | | | |
|-------------------------|-----------------------|-----------------------|-------------------|------------------------|
| Not At All
Satisfied | Not Very
Satisfied | Somewhat
Satisfied | Very
Satisfied | Extremely
Satisfied |
| 1 | 2 | 3 | 4 | 5 |

8a. If not at all or not very satisfied, please tell us why:

9. How satisfied are you with your overall recreation experience on the trail? *(circle a number)*
- | | | | | |
|-------------------------|-----------------------|-----------------------|-------------------|------------------------|
| Not At All
Satisfied | Not Very
Satisfied | Somewhat
Satisfied | Very
Satisfied | Extremely
Satisfied |
| 1 | 2 | 3 | 4 | 5 |

9a. If not at all or not very satisfied, please tell us why:

10. Did you experience any problems on the trail or at the trailhead?
- No
- Yes → What were the problems? *(please specify)*
- _____

11. On this trip, did you stay overnight at Emerald Lake or Pine Grove Campground?
- Yes
- No

- 12. Where do you live? (city and state or country)

- 13. What is your gender?
_____ Male _____ Female
- 14. What is your age? _____
- 15. Finally, is there anything else we should know about the recreational opportunities here?

THANK YOU, WE APPRECIATE YOUR TIME!

Appendix C: Postcard Reminder

This postcard was sent to visitors that were given mail-return questionnaires, if their completed surveys were not received within one week of their on-site contact.⁵

Dear Recreation Site Visitor,

You were recently asked to participate in a survey about recreation use of the Mystic Lake Trail. If you've completed and returned the questionnaire provided to you, please accept our sincere thanks. If not, please consider taking a few minutes now to complete the survey and return it to us in the postage-paid envelope provided with the survey. It should only take a few minutes.

You are one of a small number of randomly selected visitors who have been asked to participate in this study, so your responses are very important to the study's success. Information from the study will help NorthWestern Energy and the Forest Service manage recreation opportunities at the Mystic Lake Trail.

Should you have any questions, please feel free to contact us by email to pinnacle@blackfoot.net.

Sincerely,

Kim Bergstrom
Survey Administrator

⁵ A similar version was sent to West Rosebud Lake visitors.

Appendix D: Follow-up Letter

This letter, along with another questionnaire and stamped return envelope, was sent to visitors that were given mail-return questionnaires, if their completed survey was not received within three weeks of their on-site contact.⁶



Mystic Lake Trailhead

2019 Recreation Visitor Survey

Dear Recreation Site Visitor:

A few weeks ago, you were selected to participate in a study of recreation use at Mystic Lake Trailhead and received a short survey to complete and return. To date, we have not received your completed survey. If it has crossed this letter in the mail, please disregard this request and accept our thanks for your participation.

The study identifies how visitors feel about recreation facilities and opportunities associated with the Mystic Lake Trailhead. As a user of the site, we are interested in your opinions and satisfaction with the trailhead's condition, what activities you participated in, and if you experienced any problems at the site.

You are one of a small number of visitors who have been randomly selected to participate in this study, so your responses are very important for its success. We hope you will take a few minutes now to complete the enclosed questionnaire and return it to us in the postage-paid envelope provided. Please fill in your responses as they relate to your visit when you were first contacted to participate in the survey on _____.

Your responses will help NorthWestern Energy and the Forest Service manage recreation opportunities at Mystic Lake Trailhead. Please be assured that your responses will be kept completely confidential and tabulated in such a manner that no one individual can be identified.

We appreciate your cooperation. If you have any questions, please contact me.

Sincerely,

A handwritten signature in cursive script that reads "Kim Bergstrom".

Kim Bergstrom
Survey Administrator

⁶ A similar version was sent to West Rosebud Lake visitors.