

Final Report

**Open Space and Mountain Parks North Trail Study Area  
Visitation Study**

Submitted to  
Open Space and Mountain Parks  
Boulder, CO

Prepared by

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# Executive Summary

## Introduction

The purpose of this study was to monitor visitation levels across the North Trail Study Area (NTSA) for the City of Boulder Open Space and Mountain Parks (OSMP) Department to inform future work planning efforts. Data collected included:

- Visitor party size, time and day of visit, number of dogs on-leash or off-leash
- Recreation activity (biking, running, hiking, equestrian, or other)
- Mode of access to trailhead (accounted for primarily by the activity type variable (hiker, biker, runner, or car in parking lot).
- Parking lot capacity
- Weather conditions: temperature, wind, precipitation, sky cover and lightning

## Methods

Direct observation methods (i.e., count sheets) were used to determine observable visitor party size, activity distributions, visitation distributions and the mode of access to the trailheads and access points across daylight hours and all days of the week.

### Sampling design

A stratified random sampling design with a random start was used for visitor observations at 13 sites in the NTSA from June 1 through November 30, 2014.

The 13 sites monitored represent seven trailheads and six access points:

Site 1. Wonderland Lake Trail @ Poplar Ave.	Site 8. Buckingham Park Trailhead
Site 2. Fourmile Trailhead	Site 9. Wonderland Lake Trailhead
Site 3. BVR (Sage) Trailhead	Site 10. Foothills @ Second and Denver
Site 4. Eagle Parking Coffee	Site 11. Lefthand Trail @ Pebble Beach Lane
Site 5. Eagle Trailhead	Site 12. Foothills access to Eagle
Site 6. Foothills Trailhead	Site 13. Foothills @ Second and Dakota
Site 7. Lefthand Trailhead	

The stratification variables included: (1) type of day (weekday & weekend) and (2) time of day (a.m. 7 to 11:15 a.m.; mid-day 11:30 a.m. to 3:45 p.m.; evening 4 to 8:15 p.m.) for the summer months and variations to the time periods per daylight savings in the fall season. Specific days and time frames for conducting observation periods were randomly selected based on the sampling grid.

*Day of Week Stratum.* All weekend days and weekdays within the study period were considered for inclusion in the study to include four weekend days per month drawn at random per season and six weekdays per month to represent each day of the week per season. CAEC was responsible to sample 30 days (15 days per season) plus two holidays and OSMP volunteers and staff 30 days (15 days per season).

*Time of Day Stratum.* Three time of day sampling periods were selected (a.m., mid-day, p.m.) with two 2-hour shifts per sampling period. Morning is defined as 7:00 a.m. to 11:15 a.m.; mid-day is defined as 11:30 a.m. to 3:45 p.m., and evening defined as 4:00 p.m. to 8:15 p.m. Sampling hours provided coverage from 7:00 a.m. until 8:15 p.m. during the summer months. In the fall season the number of shifts was reduced to five per day in September and October and four shifts in November to reflect the daylight calendar, to mirror expected visitation and ensure field technician safety based on daylight observations.

During summer season and the month of October, fifteen-minute time intervals between shift locations were allocated for observers to travel from one site to the next and during the months of September and November this was increased to thirty-minute travel time intervals. Four 2-hour sampling segments (shifts) were randomly selected for each sample day from the six shifts available per summer day based on a stratified random selection. A sample coverage sheet was used to ensure each location was sampled all three time periods (twice per weekday and one per weekend) for a total of nine shifts per site for each season (fall/summer). For the two holidays (July 4<sup>th</sup> and Labor Day), four sites were sampled during four 2-hour shifts each day (one shift per site); the holidays, sites and shifts were not selected at random. There was some slight deviation to this schedule due to volunteer availability, shortened daylight during fall season, weather, and some minor scheduling issues. When shifts were rescheduled, they were scheduled for the same type of day, time period and location as the original shift.

Based on the day of week and time of day stratum, a sampling schedule was established for summer and fall seasons. Initially at the start of the project, the total number of sample days proposed was 24 weekend days, 36 weekdays and two holiday days (July 4<sup>th</sup> and Labor Day) between the 1<sup>st</sup> of June and November 30, 2014 for a total of 62 sampling days with one sample day equivalent to four shifts per day on most days. CAEC sampled six shifts on sampling days during the first week in June while re-adjusting the schedule to primarily four shifts per day for most sample days thereafter.

OSMP volunteers were recruited to cover 2-hour shifts with no more than two shifts per volunteer on a given day. Although the volunteer monitoring schedule was developed on a stratified random sample basis, the schedules were adjusted (same location, type of day, time of day) to meet volunteer availability and weather conditions (i.e. rain/snow). One hundred and twenty-three 2-hour shifts were sampled in the summer (68<sup>1</sup> by CAEC and 55 by OSMP volunteers) and 117 shifts in the fall (59 by CAEC and 58 by OSMP volunteers) for a total of 240 2-hour shifts.

## **Results**

Frequency distributions were determined for the numbers of visitors, groups, dogs on-leash and dogs off-leash along with the activity group types. Frequencies were also segmented by time period (a.m., midday, p.m.), type of day (weekend vs. weekday) and

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<sup>1</sup> The eight holiday shifts are included in the 68 shifts total done by CAEC for the summer season.

month (June to November), with a comparison between summer and fall months to depict seasonal differences. Data highlights are provided in the following sections: visitation, dogs on versus off-leash, activity type, modes of access, holidays, parking, and weather. Each section is organized under overall (seasons), time period, day of week, month, and site-by-site subheadings.

### **Visitation distribution highlights**

*Overall.* There were more visitors in the fall (n=4,851) than summer (n=4,146).

*Time Period.* Of the 4,146 visitor counts for all 13 sites in the summer season, the a.m. period had the most visitor counts (n=1,710), followed by p.m. (n=1,401), and the least were recorded at mid-day (n=1,035). This differed slightly during the fall season (n=4,851) with more visitors in the p.m. (n=1,763) followed by mid-day (n=1,643), and a.m. (n=1,445).

*Day of Week.* In the summer season, there were 2,366 visitors on the weekdays and 1,780 on the weekends. For the fall season, there were 2,522 weekday visitors and 2,329 for the weekend.

*Month.* The month of June had the most visitor counts (n= 2,114) followed by August (n=1,072) and July (n=960) in the summer season while November (n=2,028) had the most counts in the fall season followed by October (n=1,581) and September (n=1,242).

### *Site-by-Site Visitation*

Site 1. Wonderland Lake Trail @ Poplar Ave. was the busiest site overall in the summer season, especially in the a.m. from 8 a.m. to 11 a.m. (and a significant decrease from 1 p.m. to 4 p.m.). Fall season visitation was similar in the a.m., gradually increased through 1 p.m., dropped off slightly mid-day, had a peak at 4 p.m., and then dropped off to a constant rate from 5 to 7 p.m.

Site 2. Fourmile Trailhead had a similar pattern of visitors during summer and fall seasons except for a greater number of visitors at 8 a.m. during the fall and a greater number at 1 p.m. in the summer.

Site 3. BVR Trailhead visitation was highest in mid-morning summer (10 a.m.) with a gradual decline through 2 p.m. During the fall season, the busiest time overall was from 3 to 4 p.m.

Site 4. Eagle Parking Coffee had more visitor counts in the summer compared to the fall season. Peak visitation was during the summer season between 10 a.m. to 11 a.m. Fall visitation was more consistent in numbers in the morning and mid-day than in the summer with peak fall visitation overall between 5 and 6 p.m.

Site 5. Eagle Trailhead had similar visitation numbers both summer and fall seasons. Ten a.m. was the peak hour in the summer while 1 p.m. was the peak time in the fall.

Site 6. Foothills Trailhead visitor counts were significantly more in the fall than summer months. Summer season, from 8 a.m. to 10 a.m. had slight increases in visitor counts while the fall didn't. The summer season had two peaks (10 a.m. and 7 p.m.) while there was a more consistent range of visitor counts between 1 p.m. and 6 p.m. in the fall.

Site 7. Lefthand Trailhead had slightly more visitors in the fall than summer months. There were no randomly selected shifts in the summer from 6 to 8 p.m. and none during the late fall evening shift as well. Peak summer visitation overall was at 8 a.m. and there were no early a.m. shifts selected in the fall. There were also no fall visitors between 1 and 2 p.m. with 3 to 5 p.m. representing the peak fall counts.

Site 8. Buckingham Park Trailhead visitation was very limited with a few picnickers; many people stop to access the outhouse or to use the trash containers. During the fall months, many visitors came just for the outhouse or to sit in the parking lot in their car having lunch. There were also some road bikers on Lefthand Canyon Drive that would stop by to use the outhouse and walk to the creek.

Site 9. Wonderland Lake Trailhead had more a.m. visitors in the summer than fall; yet, fall counts were greater overall with the busiest time between 3 and 4 p.m.

Site 10. Foothills @ Second & Denver was visited slightly more in the fall than summer season, yet with similar visitation patterns during the a.m. and p.m. monitoring periods.

Site 11. Visitation to the Lefthand Trail @ Pebble Beach Lane access was limited with 54 visitors recorded in the summer and only 24 in the fall season. Most of the visitors observed accessed the trail from Lefthand Trail and were not observed on the access trail that runs behind the Pebble Beach Lane houses (see Figure 1 for Lefthand trail location and Appendix B for Lefthand Trail @ Pebble Beach Lane description).

Sites 12 & 13. Foothills access to Eagle seems to be used more in the fall than summer months while the reverse is noted for Site 13 Foothills @ 2<sup>nd</sup> and Dakota – which is mostly visited by people from the local neighborhood.

### **Dogs on versus off-leash highlights**

*Clarification.* Monitoring sites that have leash required regulations are: Wonderland Lake Trail @ Poplar Ave., Fourmile Trailhead, Lefthand Trailhead, Buckingham Park Trailhead, Wonderland Lake Trailhead, and Lefthand Trail @ Pebble Beach Lane. Thus dogs off-leash at these sites indicates non-compliant behavior. The other sites have voice and sight control regulations.<sup>2</sup>

*Overall.* Across the entire study period (summer and fall), the total number of dogs observed on-leash was 1,295 versus 505 that were observed off-leash. More dogs

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<sup>2</sup> The data for the variables dogs on-leash and off-leash is given throughout the report as the counts noted by season, time-period, type of day, month, and site-by-site highlights and not in the context of non-compliance behavior specifically.

on-leash were noted in the fall (n=787) months than summer months (n=509) with more off-leash in the fall (n=326) versus the summer (n=179).

*Time Periods.* During the summer season, the most dogs off-leash tend to be at BVR Trailhead during mid-day and p.m. with slightly more at Eagle Parking Coffee in the a.m. (both voice and sight control regulated areas). In the fall season, Eagle Parking Coffee had the most off-leash in the a.m. and BVR Trailhead at mid-day with more off-leash at Foothills access to Eagle in the p.m. OSMP trailheads require dogs on-leash within the Trailhead Leash regulation zone, but not once the dog and guardian have entered the voice and sight control designated area (typically just beyond the access gate). Some people just let their dog out of the car to immediately walk to the gate (i.e., BVR Trailhead) and enter the area.

*Day of Week.* There were totals of 711 dogs on-leash recorded in the summer and fall on weekdays and 585 on-leash on weekends. Overall, 326 dogs were off-leash in the fall and 179 in the summer months. Meanwhile, in the fall season, there was 296 dogs off-leash on the weekdays and 209 on the weekends.

*Month.* Across all study months, November (n=349) was noted for the most dogs on-leash followed by October (n=274) and June (n=252). Meanwhile, the most dogs sighted off-leash was in October (n=157).

#### *Site-by-Site.*

For areas with voice and sight control regulations, an average of 49% of observed dogs were off-leash. The Eagle Parking Coffee site had the highest average proportion of off-leash dogs (63%), followed by Foothills access to Eagle. Voice and sight control areas with the lowest proportions of off-leash dogs were BVR Trailhead and Foothills @ Second and Dakota.

For areas that require leashes, dogs off-leash were observed the most at Wonderland Lake Trail @ Poplar Ave. (4 or 5 times in June, October, and November and a couple of times the other months) followed by Wonderland Lake Trailhead with a few dogs sighted off-leash in the fall months. Five dogs were off-leash at Fourmile Trailhead in June. Only one dog was recorded off-leash at Buckingham Park Trailhead overall. These sightings represent visitor non-compliance with the leash regulation.

#### **Activity Type**

*Overall.* For total activity counts, fall season counts were greater (n=4,851) than the summer season (n=4,146) for all activity types combined. For activity type, hiking represented the activity category done most between fall (n=2,775) and summer seasons (n=2,165) followed by runners (Summer, n=1,085 and Fall, n=1,199), and cyclists (Summer, n=795 and Fall, n=737). More equestrians (n=24) and OS personnel (n=30) were recorded in the summer than fall season; but in general, equestrian use is limited and was only observed at BVR Trailhead, Lefthand Trailhead, Foothills access to Eagle, and Eagle Trailhead.

*Time Period.* The time period with the most activity counts for all activities combined was fall season p.m. (n=1,763) overall followed by summer season a.m. (n=1,710). Summer season mid-day counts were 1,035 and p.m. counts 1,401 for all activities combined. Fall a.m. activity counts were 1,445 and mid-day was 1,643 for all activities combined. Across all the time periods, cyclist visitation was recorded more during mid-day and p.m. in the fall months while a more equal distribution of cyclists across all three time periods was noted in the summer season.

- *Site-by-Site* The a.m. period was the heaviest visitation period in the summer at Wonderland Lake Trail @ Poplar Ave. and this site had more hikers at mid-day in the fall months. A similar a.m. pattern was found for runners both summer and fall. In the summer and fall seasons, the most cyclists were noted at Wonderland Lake Trail @ Poplar Ave., Fourmile, Eagle and Wonderland Lake Trailheads and the most cyclists overall were recorded in the summer months (n=795) versus fall (n=737).

*Day of Week.* Hiking was recorded less on summer weekdays (n=1,201) than fall weekdays (n=1,394), and there were less summer weekend hikers (n=964) than in the fall (n=1,381). For cycling, there were more summer weekday cyclists (n=460) than fall weekday (n=329) with a reverse pattern for weekends (335 summer vs. 408 fall). The number of runners for the summer weekdays was 645 runners and 700 runners for the fall with 440 summer weekend runners and 499 runners in the fall.

*Month.* Hiking was the most prominent activity with the most hikers recorded in November followed by June and October. Running was the second most recorded activity with consistent numbers in the fall months with the least numbers in July and August and most overall in June. The number of cyclists was consistent across each month except for June when there was slightly more cyclists than during the other months. Hiking was noted most on a weekend in June and weekday in November. Running was consistent on weekdays both summer and fall and done much more on a summer weekend in June in comparison with July and August.

*Site-by-Site.* Highlights of the three primary activity types are given with data drawn from Tables 7 and 8.

Hikers - During the summer season, the most hikers were noted at Wonderland Lake Trail @ Poplar Ave. (n=599) followed by Wonderland Lake Trailhead (n=361) and Fourmile Trailhead (n=281) and BVR Trailhead (n=175). For the fall season, the pattern was similar: Wonderland Lake Trail @ Poplar Ave. (n=802) followed by Wonderland Lake Trailhead (n=549) and Fourmile Trailhead (n=379) and BVR Trailhead (n=324).

Cyclists – During the summer season, the most cyclists were noted at Fourmile Trailhead (n=139) followed by Wonderland Lake Trail @ Poplar Ave. (n=129), and Eagle Trailhead (n=113). For the fall season, Wonderland Lake Trail @ Poplar Ave.



(n=173) had the most cyclists followed by Eagle Trailhead (n=114) and Fourmile and BVR Trailheads with the same number of cyclists (n=97).

Runners – During the summer season, the most runners were recorded at Wonderland Lake Trail @ Poplar Ave. (n=368) followed by Fourmile (n=190) and Wonderland Lake Trailheads (n=122). For the fall season, the number of runners at Wonderland Lake Trail @ Poplar Ave. (n=303) followed by Fourmile (n=304) was similar while Foothills access to Eagle (n=109) had the third most runners recorded.

### **Modes of Access**

Site 1. Wonderland Lake Trail @ Poplar Ave. access – the predominant visitors were those from the surrounding residential areas (no designated parking area). Hikers, runners, and cyclists in that order were the predominant activity groups and many visitors had a dog or dogs with them on the day of the observation. This site is the most visited access point of the 13 sites.

Site 2. Fourmile Trailhead – a large parking lot was available with no outhouse. There are spaces for approximately 36 vehicles and although the 2<sup>nd</sup> busiest site, the parking lot was never full. Runners followed by hikers were the predominant activity groups. Many cars arrived to park, then hike out of the lot heading north onto the Foothills Trail leading towards Foothills @ Second and Dakota. The parking lot also served as a place for road bikers to park to prepare for road biking along Lee Hill Drive.

Site 3. BVR (Sage) Trailhead - this is the 4<sup>th</sup> busiest site (Tables 4 & 5) with hikers as the main activity group followed by runners and cyclists. Many more visitors arrived by car to this site to gain access to the area for walking their dog, hiking and biking than the other sites. However, a good percentage of through hikers, runners and bikers were noted due to the BVR's central location and as a cross roads for several different trails. The outhouse facility is used often and the parking area was noted to exceed capacity on a few occasions although not as much as might be expected.

Site 4. Eagle Parking Coffee – has no designated parking lot but does have informal parking along North Broadway Street. A mix of hikers, cyclists, and runners primarily visit this site; many come with their dog.

Site 5. Eagle Trailhead – is a large parking lot that can accommodate 20 plus cars, high occupancy vehicles and horse trailers. This site is the 5<sup>th</sup> busiest with a similar number of hikers and cyclists followed by runners.

Site 6. Foothills Trailhead – is a small parking area for 12 to 15 cars that ranks 6<sup>th</sup> busiest in the fall and 8<sup>th</sup> or 9<sup>th</sup> in the summer. Runners are the most represented with many runners passing through (not parking a vehicle at the site).

Site 7. Lefthand Trailhead - has a large parking lot to accommodate large vehicles, horse trailers and other high occupancy vehicles. The area is not visited very often and the primary activity group represented was cyclists.

Site 8. Buckingham Park Trailhead - Car access followed by cyclists are the predominant modes of access to this site.

Site 9. Wonderland Lake Trailhead –is the 3<sup>rd</sup> busiest site with primarily hikers; many who come from the local neighborhood similar to Wonderland Lake Trail @ Poplar Ave. There are also a moderate number of runners visiting this trail.

Site 10. Foothills @ Second and Denver – there is parking along Denver Street near the access point. Hiking is the predominant access mode with limited visitation overall.

Site 11. Lefthand Trail @ Pebble Beach Lane – no designated parking. This site is accessed via private property and an easement behind a row of houses on Pebble Beach Lane. This access point had the least number of visitors and is primarily visited by people coming from the local neighborhood. Hiking was the predominant mode of access.

Site 12. Foothills access to Eagle – Fairly low visitation with some runners and hikers, many of whom come by car to walk their dog(s).

Site 13. Foothills @ Second and Dakota –ranks 10<sup>th</sup> for number of visitors. Hikers and runners represent a similar visitation pattern. Most of the access trail visitors tend to be people coming from the neighborhood.

### **Holidays**

For the holidays, there were 696 total visitors recorded for July 4<sup>th</sup> (n=283) and Labor Day (n=413) across four sites: Wonderland Lake Trail @ Poplar Ave. (n=354), Fourmile Trailhead (n=123), BVR (n=139) and Eagle Trailhead (n=80).

Hikers (n=194 on Labor Day and n=135 on July 4<sup>th</sup>) were the predominant visitor type, followed by cyclists (n=116) and runners (n=102) on Labor Day and runners (n=91) and cyclists (n=57) on July 4<sup>th</sup>. More vehicles were recorded on Labor Day (n=112) versus July 4<sup>th</sup> (n=72). There were 68 dogs on-leash and eight off-leash on Labor Day and 27 on-leash and 4 off-leash on July 4<sup>th</sup>. The total number of vehicles counted was 112 vehicles on Labor Day and 72 vehicles on the July 4<sup>th</sup>. None of the parking lot capacities were exceeded.

*Site-by-Site.* Wonderland Lake Trail @ Poplar Ave. had the most visitors on both days followed by Fourmile Trailhead on Labor Day and BVR on July 4<sup>th</sup>. Wonderland Lake Trailhead @ Poplar Ave. had the most hikers and runners recorded on both days as well as dogs on-leash. The most vehicles noted were at BVR Trailhead (n=46) on Labor Day. On July 4<sup>th</sup> Fourmile Trailhead had the most vehicle counts (n=32).

### **Parking**

Total parking counts for both summer and fall were similar. For the fall, the BVR Trailhead lot was full (exceeded capacity) four times with cars parking outside of the area

on Longhorn Road. Foothills Trailhead parking capacity was exceeded twice, Wonderland Lake Trailhead five times, and Foothills access to Eagle twice. In general, there is presently no parking problem at NTSA trailhead/access points, except for perhaps BVR and Wonderland Lake Trailheads on select days.

### **Weather**

Weather was not a big factor influencing visitation levels at NTSA areas. Visitation rates were lower during peak temperature periods as expected, especially during the mid-day summer time period. Lightning, severe windy conditions, rain and snow conditions were limited across the sampled days.

### **Recommendations**

An onsite automated monitor of visitation is a useful tool to determine visitation across all 24 hours of the day/all days of the year at designated trailheads and access areas in the NTSA. In future studies, recommendations are to include infrared monitors to supplement onsite counts as well as a random selection of onsite interviews or visitor surveys. Such data can add greater depth of understanding of visitor demographics, reasons for visiting OSMP, and overall visitation behavior.

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# **Open Space and Mountain Parks North Trail Study Area Visitation Study**

## **I. Introduction**

In accordance with the 2013-2018 Capital Improvement Program for the City of Boulder, the North Trail Study Area project calls for a planning effort to delineate some new trails, designate maintenance priorities for undesignated trails and closure and reclamation of other trails, develop trail improvements, signage etc. with the first phase to plan and inventory natural, cultural, and recreation resource aspects during 2015. An understanding of the current visitation patterns is necessary for planning and management decision-making. The Open Space and Mountain Parks Department (OSMP) last conducted a visitation study along designated access points in the North Trail Study Area (NTSA) during 2004-2005 (Vaske & Donnelly, 2008; Vaske, Shelby, & Donnelly, 2009). The NTSA has seven designated trailheads, several access points and numerous undesignated trail access points. As part of the preparation phase for conducting the NTSA Recreation Inventory, OSMP sought an update to their understanding of visitation to this planning area by means of direct observations from June 1 to November 30, 2014.

## **Project Goal**

The purpose of this study was to monitor visitation levels across the North Trail Study Area (NTSA) for the City of Boulder Open Space and Mountain Parks (OSMP) Department to inform future work planning efforts. An observational method to collect data onsite was used to gather monitoring data from June 1 to November 30, 2014.

Data collected for this project included (Appendix A):

- Visitor party size, time and day of visit, number of dogs on-leash or off-leash
- Recreation activity participation (biking, running, hiking, equestrian, or other)
- Visitation levels
- Mode of access to trailhead (accounted for primarily by the activity type variable (hiker, biker, runner or by car parking in lot).
- Parking lot capacity
- Weather conditions: temperature, wind, precipitation, sky cover and lightning

## **Objectives**

The project included the following objectives (Table 1).

**Table 1. List of project objectives, descriptions and location of data within report**

<b>Objectives</b>	<b>Description</b>	<b>Location of data</b>
<b>Objective 1.</b> Estimate visitor party demographics	Visitor party size, time and day of visit, number of dogs on-leash or off-leash	Section II.A. and Tables 6-9
<b>Objective 2.</b> Estimate the distribution of activities in the planning area	Activity type was recorded on the sampling days for the sampling periods via count sheets.	Activity comparison in Sections II.A-D and Tables 6-15. Figures 3 and 4 in Section D in particular
<b>Objective 3.</b> Estimate the distribution of visitation in the planning area, to include the counts of various activities	Number of visitors and activity type was recorded on the sampling days with an estimated distribution of activities for the sampling periods via count sheets.	Tables 6-15, and Figure 2 in Section II.A
<b>Objective 4.</b> Estimate the mode of access to the trailheads in the planning area	Mode of access was determined by parking lot counts and the type of activity engaged in.	Section II.F
<b>Objective 5.</b> Estimate number of vehicles parked at trailheads and access points in the NTSA	Direct counts were taken on 30-minute intervals at each site that was a designated trailhead or had a parking area available at an access point.	Section II.G. with Figure 5 and 6 and parking distribution tables in Appendix G 1-2

**Methods**

Direct observation methods (i.e., count sheets – Appendix A) were used to determine observable visitor party size, activity distributions, visitation distributions and the mode of access to the trailhead and access points across daylight hours and all days of the week for 13 sites. There were six 2-hour shifts possible per sampling day with up to four shifts scheduled per day based on a stratified random sample with random start approach (Veal, 2011).

**Sampling Design**

A stratified random sampling design with a random start was used for visitor observations at 13 sites in the NTSA (see Figure 1 area map). This design was used for June through November 2014. The stratification variables include: (1) type of day (weekday & weekend) and (2) time of day (am – 7 to 11:15 am; mid-day 11:30 to 3:45; evening 4 to 8:15 pm) for the summer months and variations to the times per daylight savings in the fall season. Specific days and time frames for conducting observation periods were randomly selected based on the sampling grid shown in Table 1 (adopted from Vaske et al., 2009).

**Table 2. Sampling grid for selecting days and observation times**

Day of Week Stratum			
Weekday	a.m. 7-9, 9:15-11:15	mid-day 11:30-3:45	p.m. 4-8:15
Weekend			

**Sample Strata**

*Day of Week Stratum.* All weekend days and weekdays within the study period were considered for inclusion in the study to include two weekend days per month drawn at random per season and six weekdays per month to represent each day of the week per season. CAEC was responsible to sample 30 days (15 days per season) plus two holidays and OSMP volunteers 30 days (15 days per season).

*Time of Day Stratum.* Three “time of day” sampling periods were selected (a.m., mid-day, p.m.) with two 2-hour shifts per sampling period (Table 3). Morning (a.m.) is defined as 7:00 a.m. to 11:15 a.m.; mid-day is defined as 11:30 a.m. to 3:45 p.m., and evening (p.m.) defined as 4:00 p.m. to 8:15 p.m. Sampling hours provided coverage from 7:00 a.m. until 8:15 p.m. during the summer months. In the fall season the number of shifts was reduced to five per day in September and October and four shifts in November to reflect the daylight calendar to mirror expected visitation levels and ensure field technician safety based on daylight observations.

**Table 3. NTSA visitation study - Sample schedule time periods (based on daylight calendar)**

June - August		September		October		November*	
7:00-9:00	AM	7:00-9:00	AM	7:30-9:30	AM	7:00-9:00	AM
9:15-11:15	AM	9:30-11:30	AM	9:45-11:45	AM	9:30-11:30	AM
11:30-1:30	Mid-day	12:00-2:00	Mid-day	12:00-2:00	Mid-day	12:00-2:00	Mid-day
1:45-3:45	Mid-day	2:30-4:30	Mid-day	2:15-4:15	Mid-day	3:00-5:00	PM
4:00-6:00	PM	5:00-7:00	PM	4:30-6:30	PM	N/A	
6:15-8:15	PM	N/A		N/A			

\*November 1st used October hours because Daylight Saving Time ended November 2, 2014

During summer season and the month of October, fifteen-minute time intervals between shift locations were allocated for observers to travel from one site to the next and during the months of September and November this was increased to thirty-minute travel time intervals. Four 2-hour sampling segments (shifts) were randomly selected for each sample day from the six shifts available per summer day based on a stratified random selection. A sample coverage sheet (Appendix F) was used to ensure each location (13 total) was sampled all three time periods (twice per weekday and one per weekend) for a total of nine shifts per site for each season (fall and summer) and that 4 sites were covered for each of two holidays (July 4<sup>th</sup> and Labor Day). There was some slight deviation to this schedule



due to volunteer availability, shortened daylight during fall season, weather, and some minor scheduling errors<sup>3</sup>.

Based on the “day of week” and “time of day” stratum, a sampling schedule was established for summer and fall seasons. Initially at the start of the project, the total number of sample days proposed was 24 weekend days, 36 weekdays and two holiday days (July 4<sup>th</sup> and Labor Day) between the 1<sup>st</sup> of June and November 30, 2014 for a total of 62 sampling days with one sample day equivalent to four shifts per day on most days. CAEC sampled six shifts on sampling days during the first week in June while re-adjusting the schedule to primarily four shifts per day for most sample days thereafter.

OSMP volunteers were recruited to cover 2-hour shifts with no more than two shifts per volunteer on a given day. Although the volunteer monitoring schedule was developed on a stratified random sample basis, the schedules were adjusted to meet volunteer availability and weather conditions (i.e. rain/snow). One hundred and twenty-three 2-hour shifts were sampled in the summer (68<sup>4</sup> by CAEC and 55 by OSMP volunteers) and 117 shifts in the fall (59 by CAEC and 58 by OSMP volunteers) for a total of 240 2-hour shifts (Table 4).

**Table 4. Sampling distribution by time period, personnel and season**

Summer season shifts				Fall season shifts			
Time period	OSMP	CAEC	Total	Time period	OSMP	CAEC	Total
AM	8	7	15	AM	9	7	16
AM	13	13	25	AM	8	15	23
MID-DAY	10	11	20	MID-DAY	12	13	24
MID-DAY	8	13	21	MID-DAY	17	15	32
PM	10	14	23	PM	12	9	21
PM	6	10	16				
<b>Total</b>	<b>55</b>	<b>68<sup>1</sup></b>	<b>123</b>	<b>Total</b>	<b>58</b>	<b>59</b>	<b>117</b>

<sup>1</sup>Note: Eight shifts (covered by CAEC) for July 4<sup>th</sup> and Labor Day are included in the summer shift totals

### Field Monitoring Sites

The study area for data collection included the following designated trailheads and access points for OSMP trails (site selections based on OSMP priorities) (see Figure 1).

<sup>3</sup> Site 8 Buckingham Park Trailhead was not scheduled on a weekday for a mid-day time period and Site 10 although scheduled was missed on a weekday a.m. time period; both in the summer.

<sup>4</sup> Two holidays (July 4<sup>th</sup> and Labor Day) were monitored on special request by OSMP; these dates were not selected at random nor were the four sites or four shifts per day. Holiday data results are discussed in Section E.

**Table 5. NTSA visitation study field monitoring sites**

Site 1. Wonderland Lake Trail @ Poplar Ave.	Site 8. Buckingham Park Trailhead
Site 2. Fourmile Trailhead	Site 9. Wonderland Lake Trailhead
Site 3. BVR (Sage) Trailhead	Site 10. Foothills @ Second and Denver
Site 4. Eagle Parking Coffee	Site 11. Lefthand Trail @ Pebble Beach Lane
Site 5. Eagle Trailhead	Site 12. Foothills access to Eagle
Site 6. Foothills Trailhead	Site 13. Foothills @ Second and Dakota
Site 7. Lefthand Trailhead	

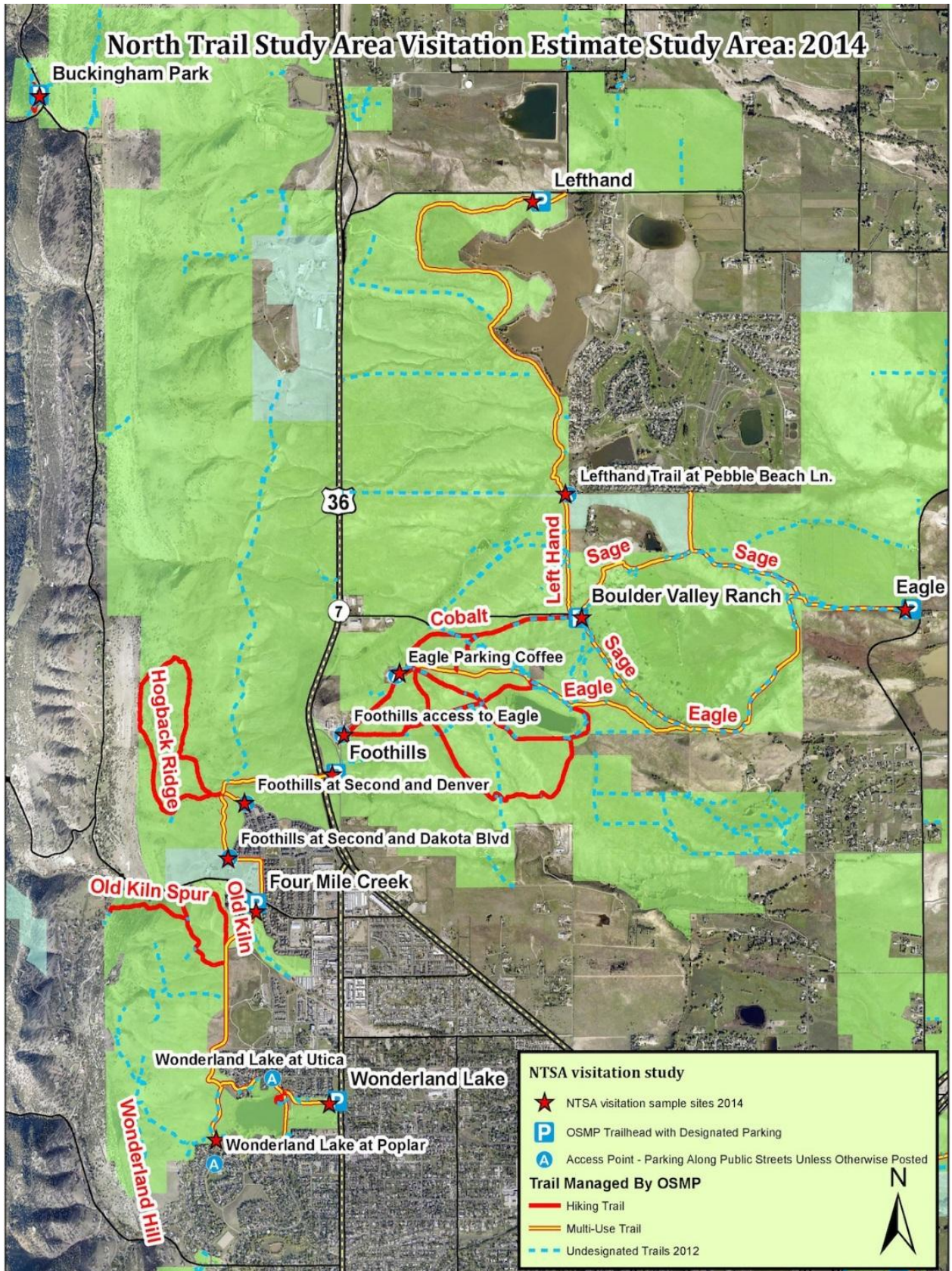


Figure 1. NTSA trailhead and access areas sampled

## **Data Analysis**

Data was summed by visitor count by shift, type of day, month and for the entire study period for each respective variable, and for each sampled access point as well as the entire study area. Frequency distributions are presented via Tables 6 to 15 for number of people, group size, number dogs on-leash, number dogs off-leash, and number of people per activity type segmented by time period (a.m., midday, p.m.), type of day (weekend vs. weekday), and month (June to November), with a comparison between summer and fall months to depict seasonal differences.

## **II. Results**

Following an overview of the visitor distributions overall (Section A, Tables 5 - 8), Sections B through D presents frequency distributions for the visitor counts, number of groups, number of dogs on-leash, number of dogs off-leash, and number of people for each activity type segmented by time period (a.m., mid-day, p.m.), type of day (weekend vs. weekday) and month (June to November), with a comparison between summer and fall months to depict seasonal differences (Tables 10-14, Figures 2 and 3). A separate section for Holidays (Section E, Table 15), Modes of Access (Section F), Parking (Section G Figures 5 and 6) and Weather (Section H, Table 16) completes the results section.

### ***A. Visitation distribution overview***

*Overall.* Tables 6 and 7 show the total visitor counts for summer and fall seasons per site by day of week (weekday vs. weekend) and time period (a.m., mid-day, p.m.). Total visitor counts were less in the summer (n=4,146) than in the fall season (n=4,851).

In the summer season, weekday p.m. was the busiest (n=953) overall followed by weekday a.m. (n=904) (Table 6), while weekend p.m. (n=979) and weekday mid-day (n=897) were the busiest in the fall (Table 7).

For the holidays (July 4<sup>th</sup> and Labor Day), there were 696 total visitors recorded for July 4<sup>th</sup> (n=283) and Labor Day (n=413) across 4 sites: Wonderland Lake Trail @ Poplar Ave. (n=354), Fourmile Trailhead (n=123), BVR Trailhead (n=139) and Eagle Trailhead (n=80). Holiday results are discussed in more detail in Section E.

*Site-by-Site overview.* Site 1 Wonderland Lake Trail @ Poplar Ave. was the busiest site both summer season (n=1,096) and fall season (n=1,280), followed by Site 2 Fourmile Trailhead, Site 9 Wonderland Lake Trailhead, and Site 3 BVR Trailhead.

**Table 6. Visitor distribution by NTSA sample site during summer season 2014**

Sample Site Name and Number	Sub-totals <sup>1</sup>	NTSA Visitation Numbers - Summer Season (June/July/August) 2014 <sup>2</sup>					
		Weekday a.m.	Weekday mid-day	Weekday p.m.	Weekend a.m.	Weekend mid-day	Weekend p.m.
1. Wonderland Lake Trail @ Poplar Ave.	1,096	286	124	284	237	57	108
2. Fourmile Trailhead	622	123	57	119	107	132	84
3. BVR (Sage) Trailhead	346	88	68	38	69	45	38
4. Eagle Parking Coffee	220	47	16	45	73	25	14
5. Eagle Trailhead	316	63	16	65	69	58	45
6. Foothills Trailhead	160	34	11	44	29	29	13
7. Lefthand Trailhead	85	30	26	8	6	13	2
8. Buckingham Park Trailhead	160	15	11	25	46	47	16
9. Wonderland Lake Trailhead	605	149	119	195	42	43	57
10. Foothills @ Second and Denver	105	5	10	6	29	16	39
11. Lefthand Trail @ Pebble Beach Lane	54	4	17	8	24	0	1
12. Foothills access to Eagle	111	37	15	19	15	12	13
13. Foothills @ Second and Dakota	266	23	19	97	60	49	18
<b>Totals</b>	<b>4,146</b>	<b>904</b>	<b>509</b>	<b>953</b>	<b>806</b>	<b>526</b>	<b>448</b>

<sup>1</sup> This data is cross-listed in Table 8

<sup>2</sup> Holiday data is summarized in Table 15



**Table 7. Visitor distribution by NTSA sample site during fall season 2014**

Sample Site Name and Number	Sub-totals <sup>1</sup>	NTSA Visitation Numbers - Fall Season (Sept/Oct/November) 2014					
		Weekday a.m.	Weekday mid-day	Weekday p.m.	Weekend a.m.	Weekend mid-day	Weekend p.m.
1. Wonderland Lake Trail @ Poplar Ave.	1,280	174	259	201	194	207	245
2. Fourmile Trailhead	818	145	121	218	118	146	70
3. BVR (Sage) Trailhead	517	83	122	40	95	50	127
4. Eagle Parking Coffee	158	30	10	32	27	41	18
5. Eagle Trailhead	326	45	73	34	22	103	49
6. Foothills Trailhead	261	23	30	64	22	54	68
7. Lefthand Trailhead	107	17	15	32	16	21	6
8. Buckingham Park Trailhead	112	23	6	35	3	32	13
9. Wonderland Lake Trailhead	735	124	51	215	62	160	123
10. Foothills @ Second and Denver	137	45	10	11	15	36	20
11. Lefthand Trail @ Pebble Beach Lane	24	0	3	4	5	4	8
12. Foothills access to Eagle	242	34	35	67	55	20	31
13. Foothills @ Second and Dakota	134	54	11	26	14	23	6
<b>Totals</b>	<b>4,851</b>	<b>797</b>	<b>746</b>	<b>979</b>	<b>648</b>	<b>897</b>	<b>784</b>

<sup>1</sup> This data is cross-listed in Table 9

### Overall visitation by location by season

*Overall.* Table 8 (summer data) and Table 9 (fall data) provide an overview of counts per observation location for the number of people, number of groups, number of dogs on-leash, number of dogs off-leash, and activity type. There were more visitors overall in the fall season (n=4,851) than summer (n=4,146). More dogs on-leash were noted in the fall (n=787) than summer (n=509) with more off-leash in the fall (n=326) versus the summer (n=179).

**Table 8. Summer visitation totals by variable by location**

<b>Observation Location</b>	<b># People<sup>1</sup></b>	<b># Groups</b>	<b># Dogs On Leash</b>	<b># Dogs Off Leash</b>	<b># Hiker</b>	<b># Cyclist</b>	<b># Runner</b>	<b># Equestrian</b>	<b># OS</b>	<b># Oth</b>
Wonderland Lake Trail @ Poplar Ave.	1,096	802	154	8	599	129	368	0	0	0
Fourmile Trailhead	622	440	53	5	281	139	190	0	1	11
BVR (Sage) Trailhead	346	240	56	52	178	71	82	12	2	1
Eagle Parking Coffee	220	176	26	40	70	86	63	0	1	0
Eagle Trailhead	316	213	28	23	143	113	52	4	0	4
Foothills Trailhead	160	118	8	7	57	49	41	0	12	1
Left-hand Trailhead	85	64	9	4	32	29	15	7	1	1
Buckingham Park Trailhead	160	83	17	1	118	25	0	0	1	16
Wonderland Lake Trailhead	605	400	84	0	376	86	122	0	8	13
Foothills @ Second and Denver	105	70	10	6	85	5	13	0	2	0
Lefthand Trail @ Pebble Beach Lane	54	37	8	0	29	17	7	1	0	0
Foothills access to Eagle	111	95	20	14	57	8	44	0	2	0
Foothills @ Second and Dakota	266	202	36	19	140	38	88	0	0	0
<b>Total Summer Visitation per Site</b>	<b>4,146</b>	<b>2,940</b>	<b>509</b>	<b>179</b>	<b>2,165</b>	<b>795</b>	<b>1,085</b>	<b>24</b>	<b>30</b>	<b>47</b>

<sup>1</sup> This data is cross-listed in Table 6



Hiking was most observed between fall (n=2,775) and summer (n=2,165) followed by running (summer; n=1,085 and fall; n=1199), and cycling (summer, n=795 and fall, n=737). More equestrians (n=24) and OS personnel (n=30) were recorded in the summer than fall; but in general, equestrian use is limited at the various sites (BVR Trailhead, Lefthand Trailhead, Foothills access to Eagle, and Eagle Trailhead).

**Table 9. Fall visitation totals by variable by location**

<b>Observation Location</b>	<b># People<sup>1</sup></b>	<b># Groups</b>	<b># Dogs On Leash</b>	<b># Dogs Off Leash</b>	<b># Hiker</b>	<b># Cyclist</b>	<b># Runner</b>	<b># Equestrian</b>	<b># OS</b>	<b># Oth</b>
Wonderland Lake Trail @ Poplar Ave.	1,280	916	201	8	802	174	303	0	0	1
Fourmile Trailhead	818	621	131	1	379	97	304	0	2	36
BVR (Sage) Trailhead	517	354	109	76	324	97	77	2	1	16
Eagle Parking Coffee	158	125	34	62	91	37	26	0	1	3
Eagle Trailhead	326	229	36	48	111	117	89	0	4	5
Foothills Trailhead	261	177	16	19	118	53	87	0	1	2
Left-hand Trailhead	107	73	10	0	28	51	18	2	3	5
Buckingham Park Trailhead	112	67	9	0	59	7	0	0	1	45
Wonderland Lake Trailhead	735	480	144	6	549	73	106	0	0	7
Foothills @ Second and Denver	137	103	16	20	104	9	24	0	0	0
Lefthand Trail @ Pebble Beach Lane	24	15	9	2	20	2	2	0	0	0
Foothills access to Eagle	242	187	41	71	115	15	109	3	0	0
Foothills @ Second and Dakota	134	104	31	13	75	5	54	0	0	0
<b>Total Fall Visitation per Site</b>	<b>4,851</b>	<b>3,451</b>	<b>787</b>	<b>326</b>	<b>2,775</b>	<b>737</b>	<b>1,199</b>	<b>7</b>	<b>13</b>	<b>120</b>

<sup>1</sup> This data is cross-listed in Table 7.

## Number of visitors at individual monitored locations

*Overall Visitation.* Figure 2 includes 14 graphs representing the percentage of visitors by hour for summer (8 a.m. to 8 p.m.) and fall seasons (8 a.m. to 7 p.m.). For those times with zero<sup>5</sup> counts, these represent either no visitors at that time or the hour time slot was not monitored for that location. Graph 2 shows visitation overall for summer and fall followed by graphs 2a to 2m representing the 13 sites monitored. As previously noted, there are more visitor counts in the fall season versus the summer season. Graph 2, with the total visitation summer and fall season comparison, shows slightly more visitors between 8 a.m. and 10 a.m. compared to the fall season with a slight dip in numbers from 2 p.m. to 4 p.m. during the heat of the day. By the hour, fall season counts remained consistent from 11 a.m. to 3 p.m. with a significant spike in numbers at 4 p.m. and then a gradual decline into the evening hours. Conversely, the number of visitors during the summer season remained relatively constant between 5 and 8 p.m.

*Site-by-Site Visitation.* Graphs 2a to 2m provide a site-by-site comparison for summer and fall. The data for these graphs was created by recoding the time of observation (i.e., exact time of visit observed) into data ranges (e.g., 7:01 to 8:00 a.m. = 8 a.m.; 8:01 to 9:00 a.m. = 9 a.m.). The following highlights the more significant trends from those graphs.

- Site 1. Wonderland Lake Trail @ Poplar Ave. was the busiest site overall especially in the a.m. from 8 a.m. to 11 a.m. and with a significant decrease from 1 p.m. to 4 p.m. in the summer. Fall visitation was not selected for observation during the early shift (no counts), gradually increased through 1 p.m., dropped off slightly midday, had a peak at 4 p.m. and then dropped off to a constant rate from 5 to 7 p.m. (graph 2a).
- Site 2. Fourmile Trailhead had a similar pattern of visitors during summer and fall seasons except for a greater number of visitors at 8 a.m. during the fall and a greater number at 1 p.m. in the summer (graph 2b).
- Site 3. BVR Trailhead visitation was highest in mid-morning summer (10 a.m.) with a gradual decline through 2 p.m. During the fall season, the busiest time appeared to be from 3 to 4 p.m. (graph 2c).
- Site 4. Eagle Parking Coffee had more visitor counts in the summer than fall months. Peak visitation was during summer season between 10 a.m. and 11 a.m. fall season visitation was more consistent in numbers in the morning and mid-day than in the summer with peak fall visitation between 5 and 6 p.m. (graph 2d).
- Site 5. Eagle Trailhead had similar visitation numbers summer and fall seasons. Ten a.m. was the peak hour in the summer while 1 p.m. was the peak time in the fall (graph 2e).

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<sup>5</sup> There were **no** shifts/counts for 8 p.m. during the fall season because of reduced daylight hours.

- Site 6. Foothills Trailhead visitor counts were significantly more in the fall than summer. Summer 8 a.m. to 10 a.m. had slight increases in visitor counts while the fall did not. The summer season had two peaks (10 a.m. and 7 p.m.) while there was a more consistent range of visitor counts between 1 p.m. and 6 p.m. in the fall (graph 2f).
- Site 7. Lefthand Trailhead had slightly more visitors in the fall than summer. There were no shifts randomly selected in the summer from 6 to 8 p.m. and none after 5 p.m. during the fall. Peak summer visitation was at 8 a.m. and all fall a.m. shifts began at 9:30 a.m. Peak visitation during the fall season was between 3 and 5 p.m. (graph 2g).
- Site 8. Buckingham Park Trailhead visitation was very limited with a few picnickers, many stopovers to access the outhouse or to use the trash containers. During the fall months, many visitors came here just for the outhouse or to sit in the parking lot in their car having lunch. There were also some road bikers on Lefthand Canyon Drive that would stop by to use the outhouse and walk to the creek (graph 2h).
- Site 9. Wonderland Lake Trailhead had more a.m. visitors in the summer than fall, yet fall counts were greater overall with the busiest time between 3 p.m. and 4 p.m. (graph 2i).
- Site 10. Foothills @ Second & Denver was visited slightly more in the fall than summer season, and had similar visitation patterns during the a.m. and p.m. monitoring periods (graph 2j).
- Site 11. Visitation to the Lefthand Trail @ Pebble Beach Lane access was limited with 54 visitors recorded in the summer and only 24 in the fall season. Most of the visitors came from the Lefthand Trail heading north or south and were not observed coming from the access trail that runs behind the Pebble Beach Lane houses (see Figure 1 for Lefthand trail location and Appendix C for Lefthand Trail @ Pebble Beach Lane description) (graph 2k).
- Sites 12 & 13. Foothills access to Eagle was busier in the fall than summer months while the reverse is noted for Site 13 Foothills @ 2<sup>nd</sup> and Dakota – which is mostly visited by people from the local neighborhood (graphs 2l and 2m).

### Overall Visitation Summer and Fall 2014

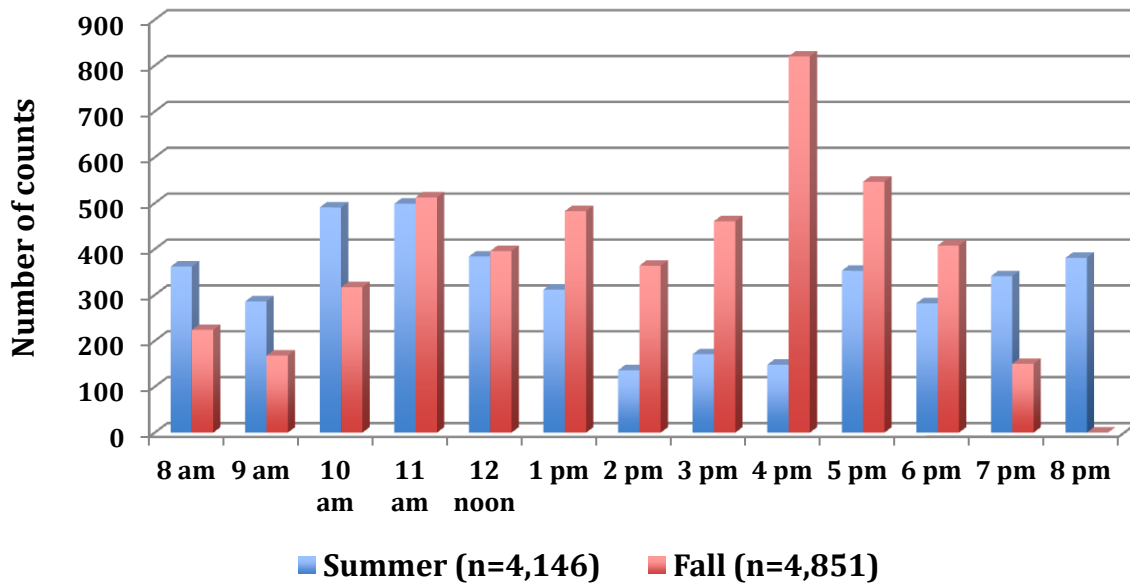


Figure 2a. Overall count distributions by hour (8 a.m. to 8 p.m.) by season for all sites

### Wonderland Lake @ Poplar Ave Visitation Summer and Fall 2014

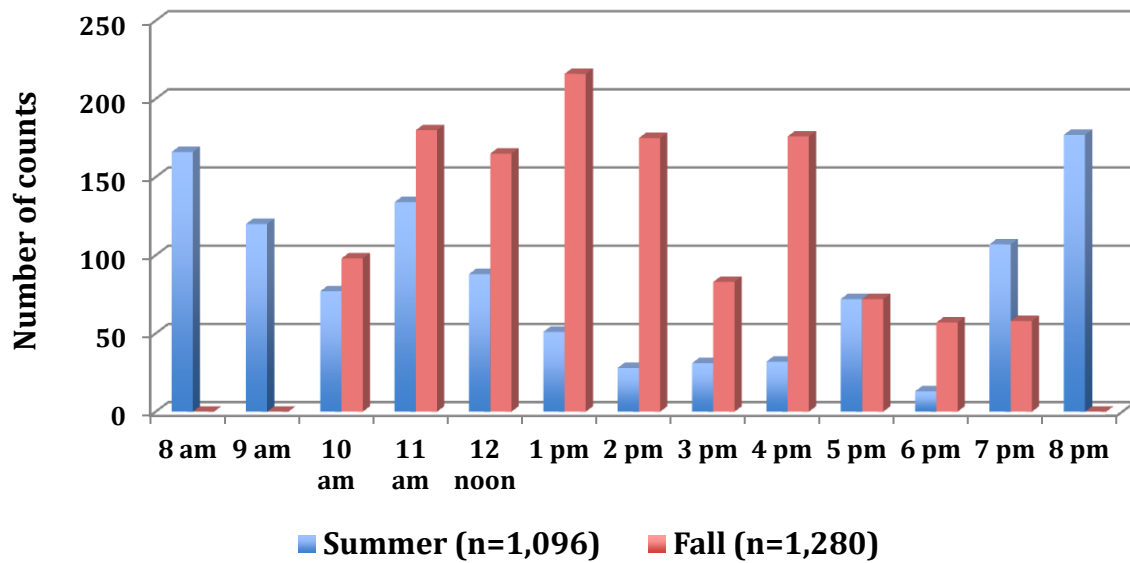


Figure 2b. Wonderland Lake @ Poplar Ave count distributions by hour (8 a.m. to 8 p.m.) by season

### Fourmile Trailhead Visitation Summer and Fall 2014

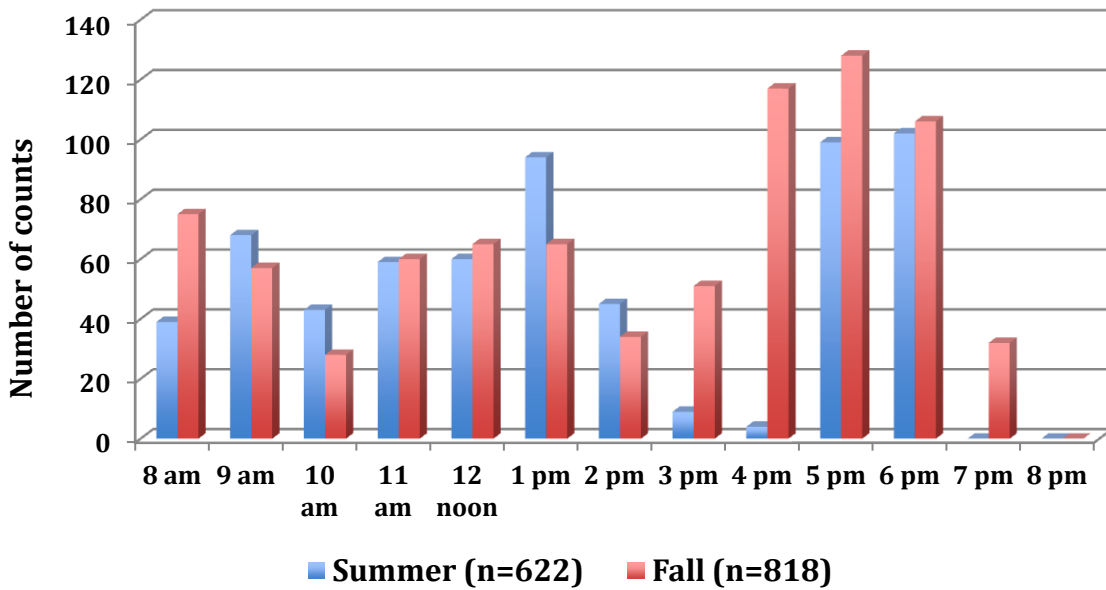


Figure 2c. Fourmile Trailhead count distributions by hour (8 a.m. to 8 p.m.) by season

### BVR Trailhead Visitation Summer and Fall 2014

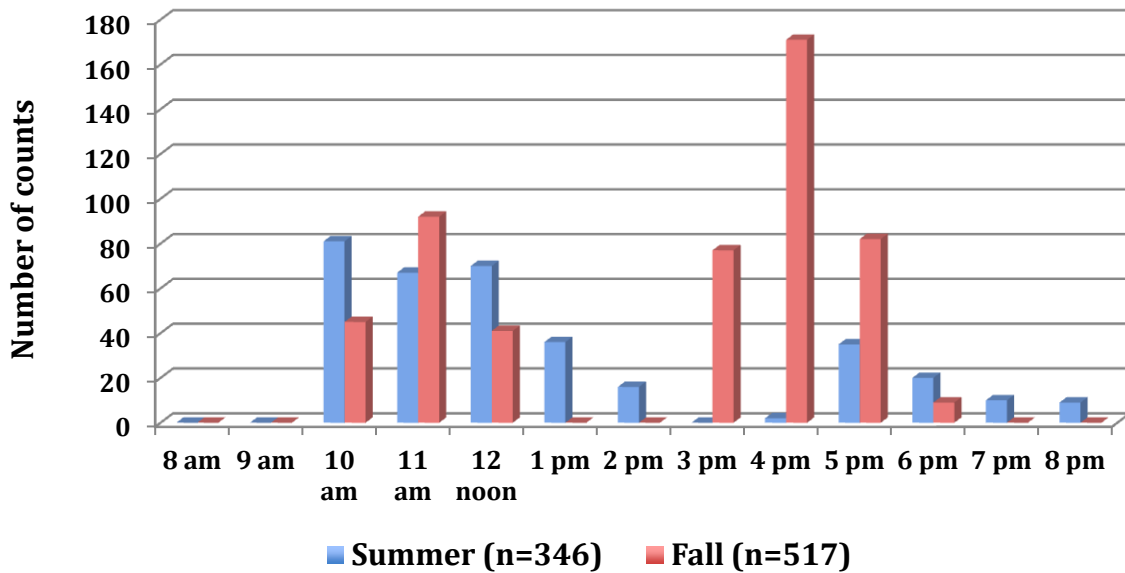


Figure 2d. BVR Trailhead count distributions by hour (8 a.m. to 8 p.m.) by season

### Eagle Parking Coffee Visitation Summer and Fall 2014

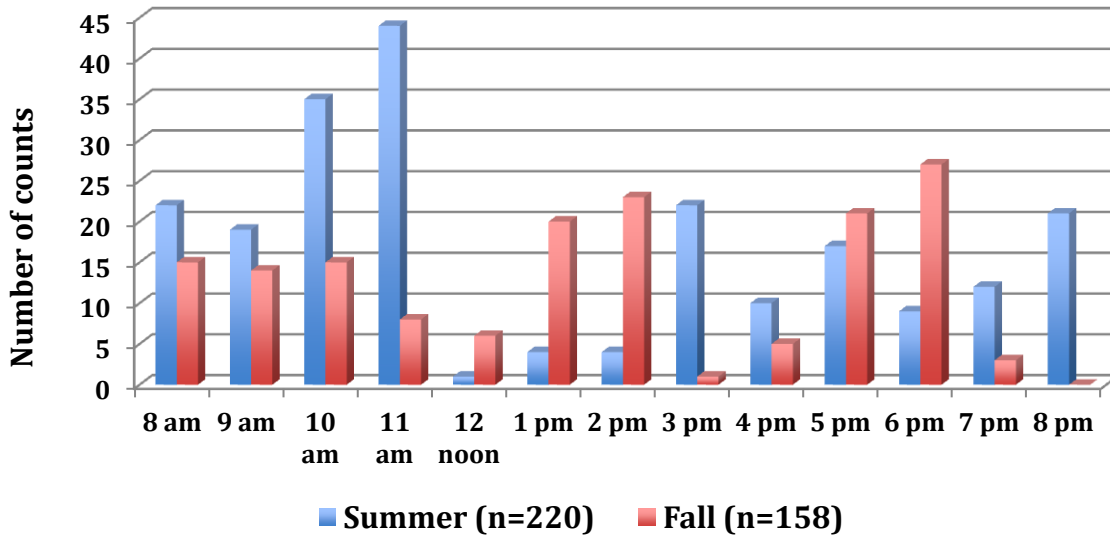


Figure 2e. Eagle Parking Coffee count distributions by hour (8 a.m. to 8 p.m.) by season

### Eagle Trailhead Visitation Summer and Fall 2014

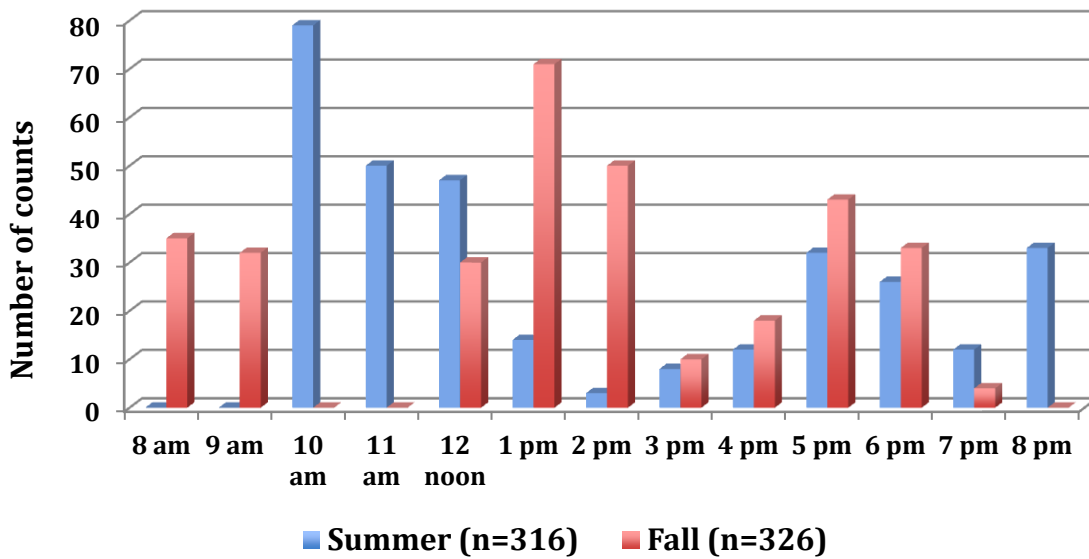


Figure 2f. Eagle Trailhead count distributions by hour (8 a.m. to 8 p.m.) by season

### Foothills Trailhead Visitation Summer and Fall 2014

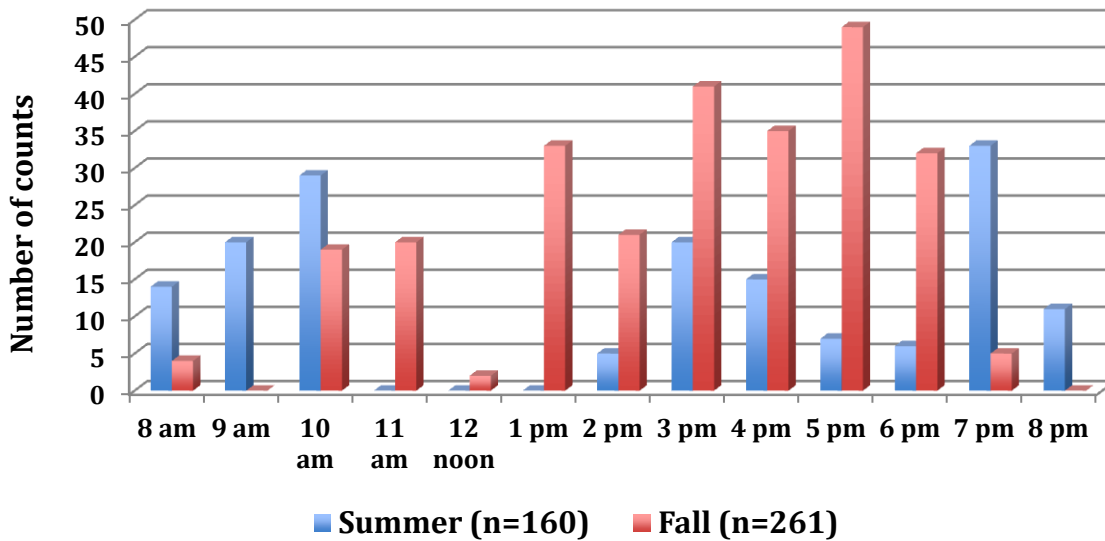


Figure 2g. Foothills Trailhead count distributions by hour (8 a.m. to 8 p.m.) by season

### Lefthand Trailhead Visitation Summer and Fall 2014

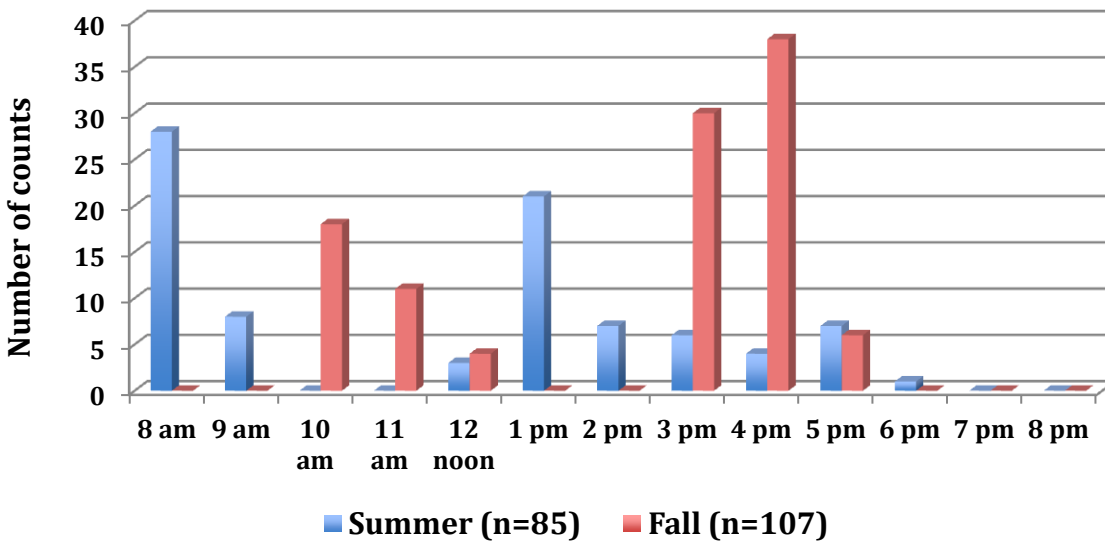


Figure 2h. Lefthand Trailhead count distributions by hour (8 a.m. to 8 p.m.) by season

### Buckingham Park Trailhead Visitation Summer and Fall 2014

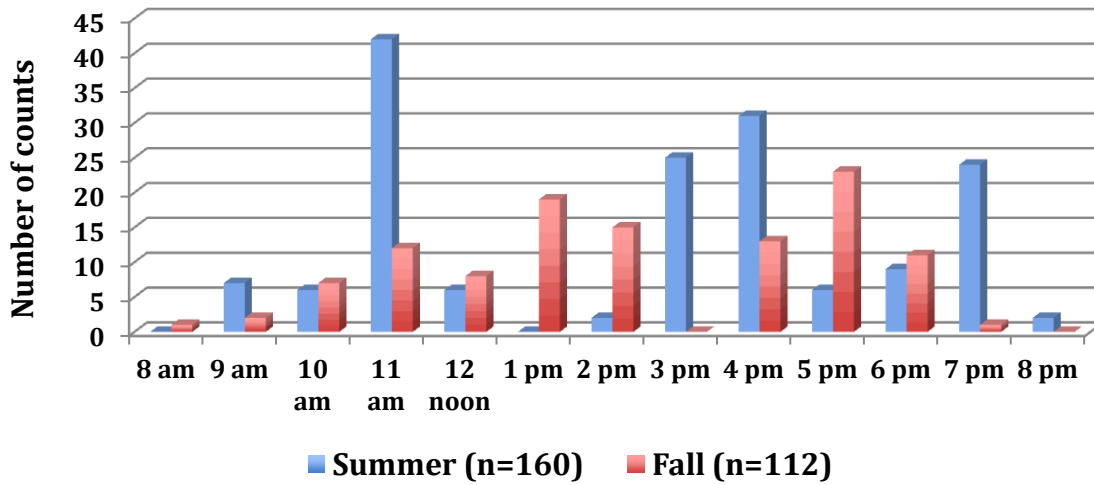


Figure 2i. Buckingham Park Trailhead count distributions by hour (8 a.m. to 8 p.m.) by season

### Wonderland Lake Trailhead Visitation Summer and Fall 2014

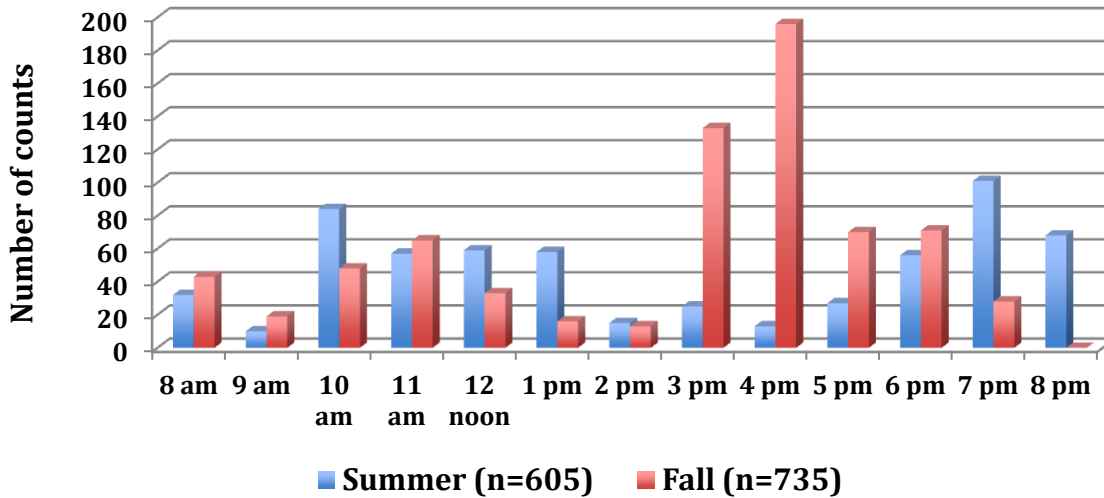


Figure 2j. Buckingham Park Trailhead count distributions by hour (8 a.m. to 8 p.m.) by season



### Foothills @ Second and Denver Visitation Summer and Fall 2014

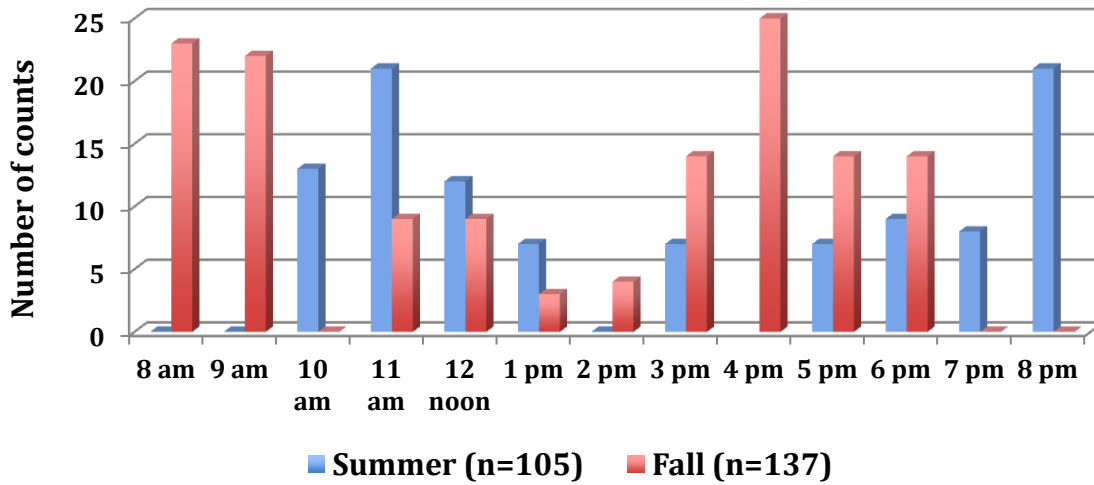


Figure 2k. Foothills @ Second and Denver count distributions by hour (8 a.m. to 8 p.m.) by season

### Lefthand Trail @ Pebble Beach Lane Visitation Summer and Fall 2014

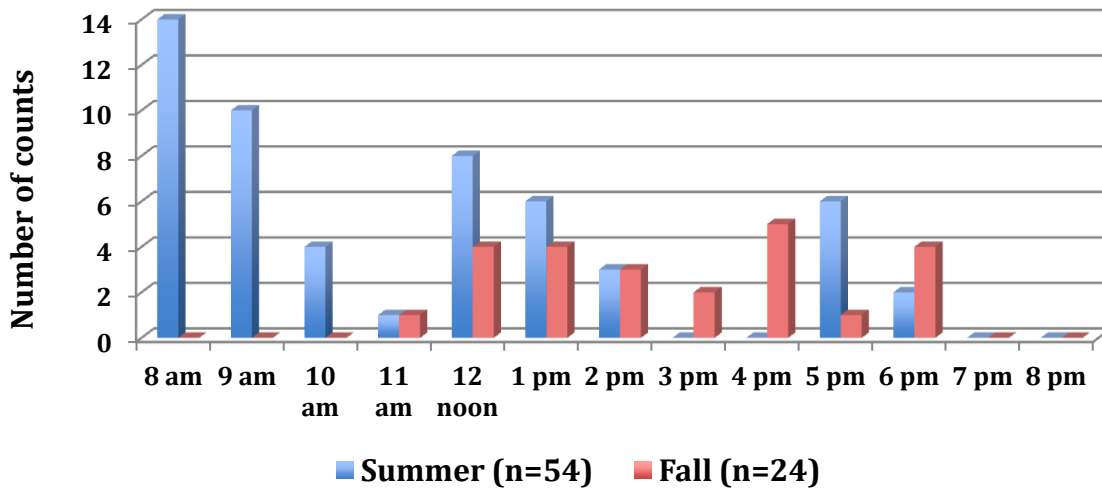


Figure 2l. Foothills @ Second and Denver count distributions by hour (8 a.m. to 8 p.m.) by season

### Foothills access to Eagle Summer Visitation Summer and Fall 2014

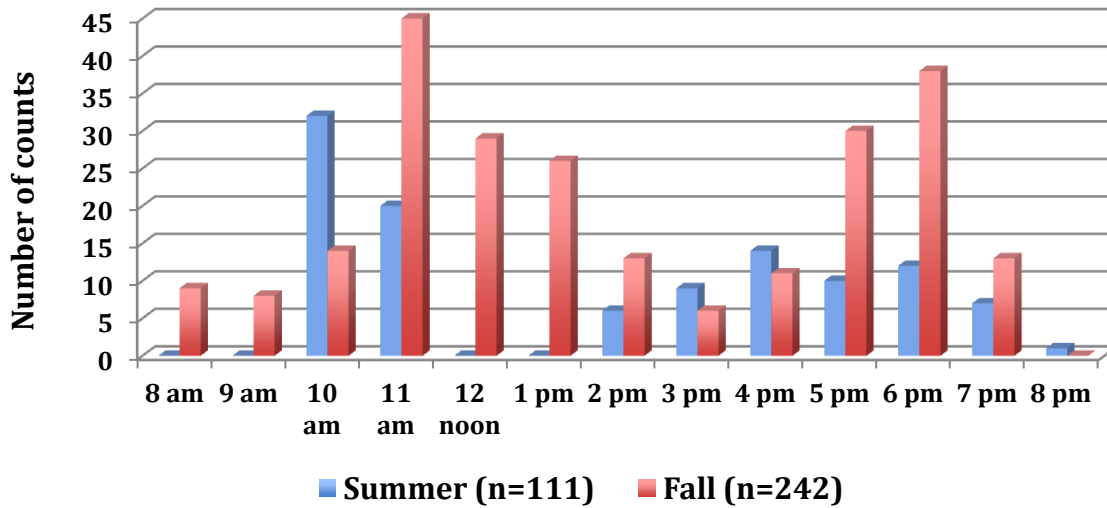


Figure 2m. Foothills @ Second and Denver count distributions by hour (8 a.m. to 8 p.m.) by season

### Foothills @ Second and Dakota Visitation Summer and Fall 2014

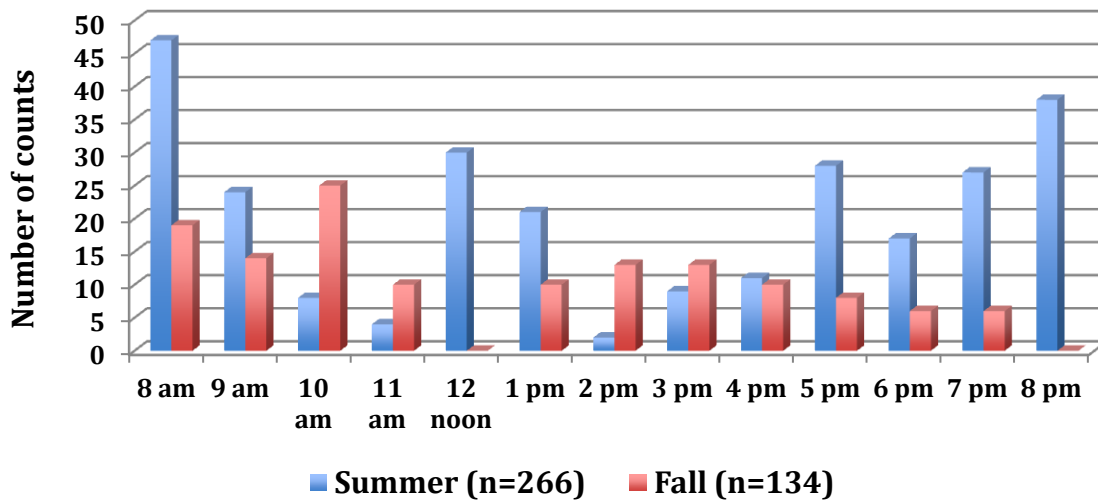


Figure 2n. Foothills @ Second and Denver count distributions by hour (8 a.m. to 8 p.m.) by season

## **Visitor Notes**

For the summer season, a total of 202 comments were recorded on the datasheets with 17% referring to cars arriving to park in the lot. Six percent of the comments referred to visitors leaving the trail. For the fall visitor notes, 660 comments were written referring to such things as runners, bikers, hikers passing through (40% of comments), as noted at Fourmile Trailhead, BVR, and Eagle Parking Coffee. Thirty percent referred to cars parking. The remaining 30% of responses referred to things such as babies in strollers, parking and sitting in the car, or parking but walking out of the parking to go on other trails (BVR and Fourmile Trailheads).

See Appendix E for an overview of all the comments made for the summer and fall seasons.

### ***B. Numbers of people, dogs, and activity type per site by time period (summer vs. fall comparison)***

*Overall.* Tables 10 and 11 provide an overview of the total numbers by variable per site segmented by time period (a.m., mid-day, p.m.) to compare the numbers of visitors, groups, dogs on-leash, dogs off-leash, and the number of people per activity. Of the 4,146 visitor counts for all 13 sites in the summer months, the a.m. period had the most visitor counts (n=1,710), followed by p.m. (n=1,401), and the least were recorded at mid-day (n=1,035). This differed slightly during the fall season (n=4,851) with more visitors in the p.m. (n=1,763) followed by mid-day (n=1,643), and a.m. (n=1,445) (Table 11).

*Site-by-Site.* Overall, Wonderland Lake Trail @ Poplar Ave. had the most visitors in the a.m. and p.m. while Fourmile Trailhead had the most mid-day in the summer. For the fall season, Wonderland Lake Trail @ Poplar Ave. had the most visitors for each time period, followed by Fourmile Trailhead for a.m. and mid-day. Wonderland Lake Trailhead had the second highest volume counts in the fall p.m. (Table 11).

### **Dogs on-leash vs. off-leash**

*Clarification.* Monitoring sites that have leash required regulations are: Wonderland Lake Trail @ Poplar Ave., Fourmile Trailhead, Lefthand Trailhead, Buckingham Park Trailhead, Wonderland Lake Trailhead, and Lefthand Trail @ Pebble Beach Lane. Thus, dogs off-leash at these locations indicates non-compliant behavior. The other sites have voice and sight control regulations<sup>6</sup> once beyond the Trailhead Leash required area.

*Overall.* Across the entire study period, the total number of dogs observed on-leash was 1,295 versus 505 that were observed off-leash (Tables 8 and 9). The most dogs on-leash were recorded at Wonderland Lake Trail @ Poplar Ave. during both summer and fall seasons followed by Wonderland Lake Trailhead, Fourmile Trailhead and BVR Trailhead (see Tables 8 and 9). This pattern holds true across all three-time periods (Tables 10 and 11). For dogs off-leash, total numbers of dogs were the greatest at BVR Trailhead, Eagle Parking Coffee, and Eagle Trailhead for both seasons and Foothills access to Eagle in the fall (Tables 8 and 9).

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<sup>6</sup> The data for the variables dogs on-leash and off-leash is given throughout the report as counts noted by season, time-period, type of day, month, and site-by-site highlights and not in the context of non-compliant behavior specifically.

### *Site-by-Site.*

For areas with voice and sight control regulations, an average of 49% of observed dogs were off-leash. The Eagle Parking Coffee site had the highest average proportion of off-leash dogs (63%), followed by Foothills access to Eagle. Voice and sight control areas with the lowest proportions of off-leash dogs were BVR Trailhead and Foothills @ Second and Dakota.

For areas that require leashes, dogs off-leash were observed the most at Wonderland Lake Trail @ Poplar Ave. (4 or 5 times in June, October, and November and a couple of times the other months) followed by Wonderland Lake Trailhead with a few dogs sighted off-leash in the fall months. Five dogs were off-leash at Fourmile Trailhead in June. Only one dog was recorded off-leash at Buckingham Park Trailhead overall. These sightings represent visitor non-compliance with the leash regulation.

During the summer, the greatest number of dogs off-leash tend to be at BVR Trailhead during mid-day and p.m. with slightly more at Eagle Parking Coffee in the a.m. (both voice and sight control regulated areas). In the fall, Eagle Parking Coffee had the most off-leash in the a.m. and BVR Trailhead at mid-day with more off-leash at Foothills access to Eagle in the p.m. (Tables 10 and 11). All trailheads require dogs on-leash within the Trailhead Leash regulation zone, but not once the dog and guardian have entered the voice and sight control designated area (typically just beyond the access gate). Some people just let their dog out of the car to immediately walk to the gate (i.e., BVR Trailhead) and enter the area.

### **Activity Comparisons**

*Overall.* The most hikers were recorded at the Wonderland Lake sites followed by Fourmile Trailhead and BVR Trailhead during both summer and fall seasons (Tables 8 and 9). Hiking was the most prominent activity, followed by running and cycling.

*Site-by-Site.* The a.m. period was the heaviest visitation period in the summer at Wonderland Lake Trail @ Poplar Ave. and this site had more hikers at mid-day in the fall months. This site had the most runners during the a.m. for both summer and fall seasons. Across the entire study period, the most cyclists were noted at Wonderland Lake Trail @ Poplar Ave., Fourmile Trailhead, Eagle and Wonderland Lake Trailheads; the most cyclists overall were recorded in the summer months (n=795) versus fall (n=737) (Tables 8 and 9). Across the time periods, cyclist visitation was recorded more during mid-day and p.m. in the fall months while a more equal distribution across all three time periods was noted in the summer season (Tables 10 and 11).

**Table 10. Total numbers by variable per site and by time period (summer season)**

<b>Time Period</b>	<b>Observation Location</b>	<b># People</b>	<b># Groups</b>	<b># Dogs On Leash</b>	<b># Dogs Off Leash</b>	<b># Hiker</b>	<b># Cyclist</b>	<b># Runner</b>	<b># Equestrian</b>	<b># OS</b>	<b># Oth</b>
<b>AM</b>	Wonderland Lake Trail @ Poplar Ave.	523	395	110	6	279	33	211	0	0	0
	Fourmile Trailhead	230	166	22	2	83	47	100	0	0	0
	BVR (Sage) Trailhead	157	110	30	17	85	29	36	7	0	0
	Eagle Parking Coffee	120	98	16	24	36	40	44	0	0	0
	Eagle Trailhead	132	91	9	10	54	50	23	4	0	1
	Foothills Trailhead	63	48	6	4	16	11	25	0	10	1
	Left-hand Trailhead	36	25	7	0	18	7	9	1	1	0
	Buckingham Park Trailhead	61	40	8	1	37	22	0	0	1	1
	Wonderland Lake Trailhead	191	132	26	0	129	23	33	0	2	4
	Foothills @ Second and Denver	34	19	5	4	30	1	3	0	0	0
	Lefthand Trail @ Pebble Beach Lane	28	19	6	0	21	1	5	1	0	0
	Foothills access to Eagle	52	45	10	10	33	7	12	0	0	0
	Foothills @ Second and Dakota	83	70	9	10	43	6	34	0	0	0
	<b>Sub-Total AM</b>	<b>1,710</b>	<b>1,258</b>	<b>264</b>	<b>88</b>	<b>861</b>	<b>277</b>	<b>535</b>	<b>13</b>	<b>14</b>	<b>7</b>
<b>Mid-day</b>	Wonderland Lake Trail @ Poplar Ave.	181	134	12	0	95	46	40	0	0	0
	Fourmile Trailhead	189	124	15	0	107	40	40	0	0	2
	BVR (Sage) Trailhead	113	75	14	18	49	35	25	1	2	1
	Eagle Parking Coffee	41	37	2	5	11	21	8	0	1	0
	Eagle Trailhead	74	48	8	5	31	28	12	0	0	3
	Foothills Trailhead	40	27	1	0	25	11	2	0	2	0
	Left-hand Trailhead	39	29	2	0	11	19	2	6	0	1
	Buckingham Park	58	25	6	0	53	3	0	0	0	2
	Wonderland Lake Trailhead	162	104	18	0	96	27	30	0	0	9
	Foothills @ Second and Denver	26	17	0	0	22	3	1	0	0	0
	Lefthand Trail @ Pebble Beach Lane	17	11	0	0	4	12	1	0	0	0
	Foothills access to Eagle	27	23	1	2	9	0	16	0	2	0
	Foothills @ Second and Dakota	68	45	9	0	40	10	18	0	0	0
	<b>Sub-Total Mid-day</b>	<b>1,035</b>	<b>699</b>	<b>88</b>	<b>30</b>	<b>553</b>	<b>255</b>	<b>195</b>	<b>7</b>	<b>7</b>	<b>18</b>

**Table 10. Total numbers by variable per site and by time period (summer season)**

<b>Time Period</b>	<b>Observation Location</b>	<b># People</b>	<b># Groups</b>	<b># Dogs On Leash</b>	<b># Dogs Off Leash</b>	<b># Hiker</b>	<b># Cyclist</b>	<b># Runner</b>	<b># Equestrian</b>	<b># OS</b>	<b># Oth</b>
<b>PM</b>	Wonderland Lake Trail @ Poplar Ave.	392	273	32	2	225	50	117	0	0	0
	Fourmile Trailhead	203	150	16	3	91	52	50	0	1	9
	BVR (Sage) Trailhead	76	55	12	17	44	7	21	4	0	0
	Eagle Parking Coffee	59	41	8	11	23	25	11	0	0	0
	Eagle Trailhead	110	74	11	8	58	35	17	0	0	0
	Foothills Trailhead	57	43	1	3	16	27	14	0	0	0
	Left-hand Trailhead	10	10	0	4	3	3	4	0	0	0
	Buckingham Park Trailhead	41	18	3	0	28	0	0	0	0	13
	Wonderland Lake Trailhead	252	164	40	0	151	36	59	0	6	0
	Foothills @ Second and Denver	45	34	5	2	33	1	9	0	2	0
	Lefthand Trail @ Pebble Beach Lane	9	7	2	0	4	4	1	0	0	0
	Foothills access to Eagle	32	27	9	2	15	1	16	0	0	0
	Foothills @ Second and Dakota	115	87	18	9	57	22	36	0	0	0
	<b>Sub Total PM</b>	<b>1,401</b>	<b>983</b>	<b>157</b>	<b>61</b>	<b>730</b>	<b>263</b>	<b>355</b>	<b>4</b>	<b>9</b>	<b>22</b>

**Table 11. Total numbers by variable per site and by time period (fall season)**

<b>Time Period</b>	<b>Observation Location</b>	<b># People</b>	<b># Groups</b>	<b># Dogs On Leash</b>	<b># Dogs Off Leash</b>	<b># Hiker</b>	<b># Cyclist</b>	<b># Runner</b>	<b># Equestrian</b>	<b># OS</b>	<b># Oth</b>
<b>AM</b>	Wonderland Lake Trail @ Poplar Ave.	368	279	70	1	213	31	124	0	0	0
	Fourmile Trailhead	263	203	50	0	100	25	125	0	1	12
	BVR (Sage) Trailhead	178	120	49	27	117	9	37	0	1	14
	Eagle Parking Coffee	57	48	18	31	37	12	7	0	1	0
	Eagle Trailhead	67	52	9	19	23	10	33	0	0	1
	Foothills Trailhead	45	35	3	4	21	5	19	0	0	0
	Left-hand Trailhead	33	22	0	0	4	19	5	0	3	2
	Buckingham Park Trailhead	26	19	0	0	5	2	0	0	0	19

**Table 11. Total numbers by variable per site and by time period (fall season)**

Time Period	Observation Location	# People	# Groups	# Dogs On Leash	# Dogs Off Leash	# Hiker	# Cyclist	# Runner	# Equestrian	# OS	# Oth
	Wonderland Lake Trailhead	186	143	34	1	116	18	50	0	0	2
	Foothills @ Second and Denver	60	46	6	6	44	3	13	0	0	0
	Lefthand Trail @ Pebble Beach Lane	5	3	0	1	4	0	1	0	0	0
	Foothills access to Eagle	89	68	19	24	36	0	53	0	0	0
	Foothills @ Second and Dakota	68	54	8	7	27	3	38	0	0	0
	<b>Sub-Total AM</b>	<b>1,445</b>	<b>1,092</b>	<b>266</b>	<b>121</b>	<b>747</b>	<b>137</b>	<b>505</b>	<b>0</b>	<b>6</b>	<b>50</b>
<b>Mid-day</b>	Wonderland Lake Trail @ Poplar Ave.	466	322	62	3	304	68	93	0	0	1
	Fourmile Trailhead	267	186	31	0	124	46	77	0	0	20
	BVR (Sage) Trailhead	172	126	24	39	99	56	13	2	0	2
	Eagle Parking Coffee	51	33	7	8	33	5	10	0	0	3
	Eagle Trailhead	176	124	15	15	47	84	37	0	4	4
	Foothills Trailhead	84	65	11	2	35	15	31	0	1	2
	Left-hand Trailhead	36	26	4	0	8	19	6	0	0	3
	Buckingham Park Trailhead	38	24	5	0	30	4	0	0	1	3
	Wonderland Lake Trailhead	211	134	51	3	169	17	25	0	0	0
	Foothills @ Second and Denver	46	34	5	4	36	3	7	0	0	0
	Lefthand Trail @ Pebble Beach Lane	7	5	0	0	5	2	0	0	0	0
	Foothills access to Eagle	55	42	4	8	17	7	28	3	0	0
	Foothills @ Second and Dakota	34	27	13	2	23	2	9	0	0	0
	<b>Sub-Total Mid-day</b>	<b>1,643</b>	<b>1,148</b>	<b>232</b>	<b>84</b>	<b>930</b>	<b>325</b>	<b>336</b>	<b>5</b>	<b>6</b>	<b>38</b>
<b>PM</b>	Wonderland Lake Trail @ Poplar Ave.	446	315	69	4	285	75	86	0	0	0
	Fourmile Trailhead	288	232	50	1	155	26	102	0	1	4
	BVR (Sage) Trailhead	167	108	36	10	108	32	27	0	0	0
	Eagle Parking Coffee	50	44	9	23	21	20	9	0	0	0
	Eagle Trailhead	83	53	12	14	41	23	19	0	0	0
	Foothills Trailhead	132	77	2	13	62	33	37	0	0	0
	Left-hand Trailhead	38	25	6	0	16	13	7	2	0	0
	Buckingham Park Trailhead	48	24	4	0	24	1	0	0	0	23

**Table 11. Total numbers by variable per site and by time period (fall season)**

<b>Time Period</b>	<b>Observation Location</b>	<b># People</b>	<b># Groups</b>	<b># Dogs On Leash</b>	<b># Dogs Off Leash</b>	<b># Hiker</b>	<b># Cyclist</b>	<b># Runner</b>	<b># Equestrian</b>	<b># OS</b>	<b># Oth</b>
	Wonderland Lake Trailhead	338	203	59	2	264	38	31	0	0	5
	Foothills @ Second and Denver	31	23	5	10	24	3	4	0	0	0
	Lefthand Trail @ Pebble Beach Lane	12	7	9	1	11	0	1	0	0	0
	Foothills access to Eagle	98	77	18	39	62	8	28	0	0	0
	Foothills @ Second and Dakota	32	23	10	4	25	0	7	0	0	0
	<b>Sub Total PM</b>	<b>1,763</b>	<b>1,211</b>	<b>289</b>	<b>121</b>	<b>1,098</b>	<b>271</b>	<b>358</b>	<b>2</b>	<b>1</b>	<b>32</b>



### ***C. Numbers of people, dogs, and activity type per site by type of day (Summer vs. Fall comparison)***

Tables 12 and 13 provide an overview of the total numbers by variable per site segmented by type of day (weekday vs. weekend) to compare the number of visitors, dogs on-leash, dogs off-leash, and number of people per activity. Of the 4,146 visitor counts for all 13 sites in the summer months, there were 2,366 visitor counts on the weekdays<sup>7</sup> and 1,780 on the weekends (Table 12). For the fall (n=4,851), there were 2,522 weekday visitors and 2,329 for the weekend.

#### **Dogs on-leash vs. off-leash**

*Overall.* There were 711 total dogs on-leash recorded in the summer and fall on weekdays and 585 on weekends (Tables 12 and 13). Overall, 326 dogs were off-leash in the fall and 179 were off-leash in the summer months. Meanwhile, in the fall, there was 418 dogs on-leash on the weekdays and 369 on-leash on the weekends (Tables 12 and 13).

*Site-by-Site.* The most dogs on-leash were recorded at Wonderland Lake Trail @ Poplar Ave. followed by Wonderland Lake Trailhead, Fourmile and BVR Trailheads (Tables 12 and 13) during both summer and fall seasons along with holidays. This pattern was similar for weekdays and weekends.

Dogs off-leash were the greatest at BVR Trailhead, Foothills Access to Eagle and Eagle Parking Coffee during the summer weekdays and BVR Trailhead, Eagle Parking Coffee, Eagle Trailhead and Foothills @ Second and Dakota on the weekends. For the fall season, dogs off-leash were more common at more areas with Foothills access to Eagle and BVR Trailhead having the most on weekdays and slightly less on weekends (Tables 12 and 13). Note that each of these highest off-leash visits areas has voice and sight control regulations.

#### **Activity Comparison**

*Overall.* Hiking was recorded less on summer weekdays (n=1,201) and then on fall weekdays (n=1,394), and there were less summer weekend hikers (n=964) than in the fall weekends (n=1,381). For cycling, there were more summer weekday cyclists (n=460) than fall weekday (n=329) with a reverse pattern for weekends (335 summer vs. 408 fall). The number of runners for the summer weekdays was 645 and 700 for the fall with 440 summer weekend runners and 499 weekend runners in the fall.

*Site-by-Site.* When comparing summer to fall there are some differences noted with more hikers in the fall weekend (n=412) than summer weekend (n=228) at Wonderland Lake Trail @ Poplar Ave. while this site had more hikers on the fall weekday (n=390) than summer weekday (n=371). There are more runners on the weekend (n=102) at Fourmile Trailhead in the summer than the fall (n=98) there are more runners on the fall weekday (n=206) than summer weekday (n=88) (Tables 12 and 13).

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<sup>7</sup> Note: Weekdays represent six sample days per month versus weekends four days per month. The sample consisted of six weekdays and three weekend days per season per site.

**Table 12. Total numbers by variable per site and by type of day (summer season)**

Type of Day	Observation Location	# People	# Groups	# Dogs On Leash	# Dogs Off Leash	# Hiker	# Cyclist	# Runner	# Equestrian	# OS	# Oth	
<b>Weekday</b>	Wonderland Lake Trail @ Poplar Ave.	694	530	108	5	371	73	250	0	0	0	
	Fourmile Trailhead	299	217	25	0	124	81	88	0	1	5	
	BVR (Sage) Trailhead	194	133	30	31	108	38	41	4	2	1	
	Eagle Parking Coffee	108	86	15	23	37	40	31	0	0	0	
	Eagle Trailhead	144	106	14	11	50	54	32	4	0	4	
	Foothills Trailhead	89	67	3	6	22	27	27	0	12	1	
	Left-hand Trailhead	64	49	6	4	27	24	8	3	1	1	
	Buckingham Park Trailhead	51	30	5	1	27	10	0	0	1	13	
	Wonderland Lake Trailhead	463	299	51	0	303	63	92	0	2	3	
	Foothills @ Second and Denver	21	15	1	3	17	1	3	0	0	0	
	Lefthand Trail @ Pebble Beach Lane	29	20	2	0	11	15	3	0	0	0	
	Foothills access to Eagle	71	63	9	11	33	8	28	0	2	0	
	Foothills @ Second and Dakota	139	108	24	8	71	26	42	0	0	0	
	<b>Summer Sub-Total Weekday</b>		<b>2,366</b>	<b>1,723</b>	<b>293</b>	<b>103</b>	<b>1,201</b>	<b>460</b>	<b>645</b>	<b>11</b>	<b>21</b>	<b>28</b>
	<b>Weekend</b>	Wonderland Lake Trail @ Poplar Ave.	402	272	46	3	228	56	118	0	0	0
Fourmile Trailhead		323	223	28	5	157	58	102	0	0	6	
BVR (Sage) Trailhead		152	107	26	21	70	33	41	8	0	0	
Eagle Parking Coffee		112	90	11	17	33	46	32	0	1	0	
Eagle Trailhead		172	107	14	12	93	59	20	0	0	0	
Foothills Trailhead		71	51	5	1	35	22	14	0	0	0	
Left-hand Trailhead		21	15	3	0	5	5	7	4	0	0	
Buckingham Park Trailhead		109	53	12	0	91	15	0	0	0	3	
Wonderland Lake Trailhead		142	101	33	0	73	23	30	0	6	10	
Foothills @ Second and Denver		84	55	9	3	68	4	10	0	2	0	
Lefthand Trail @ Pebble Beach Lane		25	17	6	0	18	2	4	1	0	0	
Foothills access to Eagle		40	32	11	3	24	0	16	0	0	0	
Foothills @ Second and Dakota		127	94	12	11	69	12	46	0	0	0	
<b>Summer Sub-Total Weekend</b>			<b>1,780</b>	<b>1,217</b>	<b>216</b>	<b>76</b>	<b>964</b>	<b>335</b>	<b>440</b>	<b>13</b>	<b>9</b>	<b>19</b>

**Table 13. Total numbers by variable of people per site by type of day (fall season)**

Type of Day	Observation Location	# People	# Groups	# Dogs On Leash	# Dogs Off Leash	# Hiker	# Cyclist	# Runner	# Equestrian	# OS	# Oth
<b>Weekday</b>	Wonderland Lake Trail @ Poplar Ave.	634	468	101	1	390	71	172	0	0	1
	Fourmile Trailhead	484	384	77	0	210	52	206	0	1	15
	BVR (Sage) Trailhead	245	194	55	48	138	51	49	2	1	4
	Eagle Parking Coffee	72	67	18	33	37	20	13	0	1	1
	Eagle Trailhead	152	117	17	20	58	45	40	0	4	5
	Foothills Trailhead	117	90	6	16	45	23	46	0	1	2
	Left-hand Trailhead	64	44	9	0	25	24	8	2	3	2
	Buckingham Park Trailhead	64	42	3	0	16	3	0	0	1	44
	Wonderland Lake Trailhead	390	256	80	1	301	31	52	0	0	6
	Foothills @ Second and Denver	66	52	7	11	49	4	13	0	0	0
	Lefthand Trail @ Pebble Beach Lane	7	5	4	1	5	2	0	0	0	0
	Foothills access to Eagle	136	104	27	51	72	0	61	3	0	0
	Foothills @ Second and Dakota	91	68	14	11	48	3	40	0	0	0
	<b>Fall Sub-Total Weekday</b>		<b>2,522</b>	<b>1,891</b>	<b>418</b>	<b>193</b>	<b>1,394</b>	<b>329</b>	<b>700</b>	<b>7</b>	<b>12</b>
<b>Weekend</b>	Wonderland Lake Trail @ Poplar Ave.	646	448	100	7	412	103	131	0	0	0
	Fourmile Trailhead	334	237	54	1	169	45	98	0	1	21
	BVR (Sage) Trailhead	272	160	54	28	186	46	28	0	0	12
	Eagle Parking Coffee	86	58	16	29	54	17	13	0	0	2
	Eagle Trailhead	174	112	19	28	53	72	49	0	0	0
	Foothills Trailhead	144	87	10	3	73	30	41	0	0	0
	Left-hand Trailhead	43	29	1	0	3	27	10	0	0	3
	Buckingham Park Trailhead	48	25	6	0	43	4	0	0	0	1
	Wonderland Lake Trailhead	345	224	64	5	248	42	54	0	0	1
	Foothills @ Second and Denver	71	51	9	9	55	5	11	0	0	0
	Lefthand Trail @ Pebble Beach Lane	17	10	5	1	15	0	2	0	0	0
	Foothills access to Eagle	106	83	14	20	43	15	48	0	0	0
	Foothills @ Second and Dakota	43	36	17	2	27	2	14	0	0	0
	<b>Fall Sub-Total Weekend</b>		<b>2,329</b>	<b>1,560</b>	<b>369</b>	<b>133</b>	<b>1,381</b>	<b>408</b>	<b>499</b>	<b>0</b>	<b>1</b>

***D. Numbers of people, dogs, and activity type per site by month (summer vs. fall comparison)***

Table 14 provides an overview of the total numbers by variable per site segmented by month (June to November). The month of June had the most visitor counts (n= 2,114) followed by August (n=1,072) and July (n=960) in the summer while November (n=2,028) had the most visitor counts in the fall followed by October (n=1,581) and September (n=1,242).

Wonderland Lake Trail @ Poplar Ave. had the most counts in June and November while Fourmile Trailhead had the most in October (n=344). BVR Trailhead had the most visitor counts in July (n=248) followed by October (n=172) and November (n=233).

**Dogs on-leash vs. off-leash**

*Overall.* Across all study months, November (n=349) was noted for the most dogs on-leash followed by October (n=274) and June (n=252). Meanwhile, the most dogs observed off-leash was in October (n=157). Monitoring sites that have leash required regulations are: Wonderland Lake Trail @ Poplar Ave., Fourmile Trailhead, Lefthand Trailhead, Buckingham Park Trailhead, Wonderland Lake Trailhead, and Lefthand Trail @ Pebble Beach Lane.

*Site-by-Site.* Dogs off-leash were observed the most at Wonderland Lake Trail @ Poplar Ave. (4 or 5 times in June/October/November and a couple of times the other months) followed by Wonderland Lake Trailhead with a few dogs sighted off-leash in the fall months. Five dogs were off-leash at Fourmile Trailhead in June. Only one dog was recorded off-leash at Buckingham Park Trailhead (Table 14). These sightings represent non-compliance. The other sites have voice and sight regulations for dogs.

**Table 14. Total numbers by variable per site and by month (summer and fall seasons)**

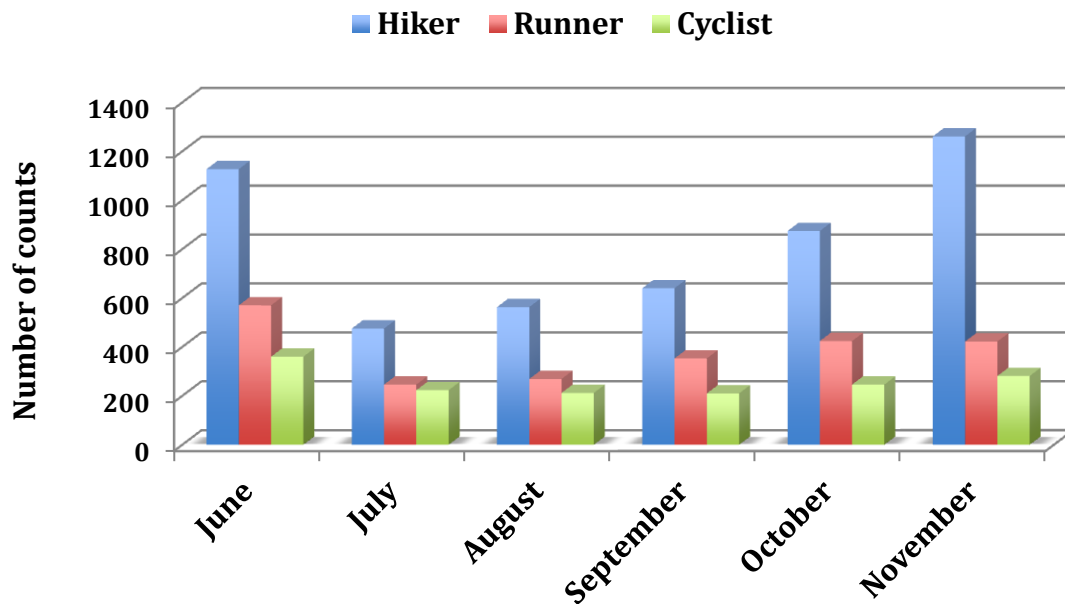
Month	Observation Location	# People	# Groups	# Dogs On Leash	# Dogs Off Leash	# Hiker	# Cyclist	# Runner	# Equestrian	# OS	# Oth
<b>June</b>	Wonderland Lake Trail @ Poplar Ave.	693	491	104	5	380	94	219	0	0	0
	Fourmile Trailhead	382	263	34	5	184	76	115	0	1	6
	BVR (Sage) Trailhead	124	86	16	24	60	24	35	3	2	0
	Eagle Parking Coffee	66	55	5	18	22	20	23	0	1	0
	Eagle Trailhead	142	82	12	7	80	42	15	4	0	1
	Foothills Trailhead	110	76	5	7	38	34	26	0	11	1
	Left-hand Trailhead	38	26	8	0	23	3	6	5	1	0
	Buckingham Park Trailhead	34	22	4	0	22	5	0	0	1	6
	Wonderland Lake Trailhead	204	139	27	0	122	28	43	0	0	11
	Foothills @ Second and Denver	52	28	5	3	47	3	2	0	0	0
	Lefthand Trail @ Pebble Beach Lane	45	30	6	0	25	13	6	1	0	0
	Foothills access to Eagle	51	42	9	2	29	1	19	0	2	0
	Foothills @ Second and Dakota	173	136	17	14	95	17	61	0	0	0
	<b>Sub-Total June</b>	<b>2,114</b>	<b>1,476</b>	<b>252</b>	<b>85</b>	<b>1,127</b>	<b>360</b>	<b>570</b>	<b>13</b>	<b>19</b>	<b>25</b>
<b>July</b>	Wonderland Lake Trail @ Poplar Ave.	189	157	31	2	91	13	85	0	0	0
	Fourmile Trailhead	107	75	4	0	56	30	21	0	0	0
	BVR (Sage) Trailhead	177	123	33	20	94	36	40	7	0	0
	Eagle Parking Coffee	37	30	4	3	7	21	9	0	0	0
	Eagle Trailhead	118	88	7	9	41	52	25	0	0	0
	Foothills Trailhead	31	26	2	0	12	8	10	0	1	0
	Left-hand Trailhead	20	13	1	0	4	8	6	2	0	0
	Buckingham Park Trailhead	101	52	11	1	81	20	0	0	0	0
	Wonderland Lake Trailhead	124	84	25	0	62	19	37	0	6	0
	Foothills @ Second and Denver	3	3	0	0	1	1	1	0	0	0
	Lefthand Trail @ Pebble Beach Lane	8	6	2	0	4	3	1	0	0	0
	Foothills access to Eagle	10	9	3	1	4	0	6	0	0	0
	Foothills @ Second and Dakota	35	21	8	3	18	12	5	0	0	0
	<b>Sub-Total July</b>	<b>960</b>	<b>687</b>	<b>131</b>	<b>39</b>	<b>475</b>	<b>223</b>	<b>246</b>	<b>9</b>	<b>7</b>	<b>0</b>

Month	Observation Location	# People	# Groups	# Dogs On Leash	# Dogs Off Leash	# Hiker	# Cyclist	# Runner	# Equestrian	# OS	# Oth
<b>August</b>	Wonderland Lake Trail @ Poplar Ave.	214	154	19	1	128	22	64	0	0	0
	Fourmile Trailhead	133	102	15	0	41	33	54	0	0	5
	BVR (Sage) Trailhead	45	31	7	8	24	11	7	2	0	1
	Eagle Parking Coffee	117	91	17	19	41	45	31	0	0	0
	Eagle Trailhead	56	43	9	7	22	19	12	0	0	3
	Foothills Trailhead	19	16	1	0	7	7	5	0	0	0
	Left-hand Trailhead	27	25	0	4	5	18	3	0	0	1
	Buckingham Park Trailhead	25	9	2	0	15	0	0	0	0	10
	Wonderland Lake Trailhead	277	177	32	0	192	39	42	0	2	2
	Foothills @ Second and Denver	50	39	5	3	37	1	10	0	2	0
	Lefthand Trail @ Pebble Beach Lane	1	1	0	0	0	1	0	0	0	0
	Foothills access to Eagle	50	44	8	11	24	7	19	0	0	0
	Foothills @ Second and Dakota	58	45	11	2	27	9	22	0	0	0
	<b>Sub-Total August</b>	<b>1,072</b>	<b>777</b>	<b>126</b>	<b>55</b>	<b>563</b>	<b>212</b>	<b>269</b>	<b>2</b>	<b>4</b>	<b>22</b>
<b>September</b>	Wonderland Lake Trail @ Poplar Ave.	376	292	56	0	202	59	114	0	0	1
	Fourmile Trailhead	196	159	25	0	75	16	105	0	0	0
	BVR (Sage) Trailhead	112	79	15	27	61	28	21	0	0	2
	Eagle Parking Coffee	39	33	1	20	18	7	13	0	0	1
	Eagle Trailhead	47	39	1	4	12	15	13	0	3	4
	Foothills Trailhead	24	16	1	7	16	3	5	0	0	0
	Left-hand Trailhead	49	33	0	0	7	30	9	0	0	3
	Buckingham Park Trailhead	74	44	6	0	44	6	0	0	0	24
	Wonderland Lake Trailhead	216	151	38	2	141	33	41	0	0	1
	Foothills @ Second and Denver	15	11	0	2	11	1	3	0	0	0
	Lefthand Trail @ Pebble Beach Lane	4	3	4	1	4	0	0	0	0	0
	Foothills access to Eagle	20	17	1	0	9	7	4	0	0	0
	Foothills @ Second and Dakota	70	53	16	4	40	5	25	0	0	0
	<b>Sub-Total September</b>	<b>1,242</b>	<b>930</b>	<b>164</b>	<b>67</b>	<b>640</b>	<b>210</b>	<b>353</b>	<b>0</b>	<b>3</b>	<b>36</b>

Month	Observation Location	# People	# Groups	# Dogs On Leash	# Dogs Off Leash	# Hiker	# Cyclist	# Runner	# Equestrian	# OS	# Oth
<b>October</b>	Wonderland Lake Trail @ Poplar Ave.	324	224	54	4	202	51	71	0	0	0
	Fourmile Trailhead	344	266	59	0	159	44	115	0	1	25
	BVR (Sage) Trailhead	172	136	33	32	93	44	30	2	1	2
	Eagle Parking Coffee	59	53	18	26	30	21	8	0	0	0
	Eagle Trailhead	71	44	11	14	33	23	15	0	0	0
	Foothills Trailhead	143	108	12	8	53	28	59	0	1	2
	Left-hand Trailhead	15	12	4	0	5	8	2	0	0	0
	Buckingham Park Trailhead (not sampled)	0	0	0	0	0	0	0	0	0	0
	Wonderland Lake Trailhead	160	95	34	3	129	13	18	0	0	0
	Foothills @ Second and Denver	101	75	15	11	77	6	18	0	0	0
	Lefthand Trail @ Pebble Beach Lane	0	0	0	0	0	0	0	0	0	0
	Foothills access to Eagle	183	136	31	58	87	8	85	3	0	0
	Foothills @ Second and Dakota	9	8	3	1	6	0	3	0	0	0
	<b>Sub-Total October</b>	<b>1,581</b>	<b>1,157</b>	<b>274</b>	<b>157</b>	<b>874</b>	<b>246</b>	<b>424</b>	<b>5</b>	<b>3</b>	<b>29</b>
<b>November</b>	Wonderland Lake Trail @ Poplar Ave.	580	400	91	4	398	64	118	0	0	0
	Fourmile Trailhead	278	196	47	1	145	37	84	0	1	11
	BVR (Sage) Trailhead	233	139	61	17	170	25	26	0	0	12
	Eagle Parking Coffee	60	39	15	16	43	9	5	0	1	2
	Eagle Trailhead	208	146	24	30	66	79	61	0	1	1
	Foothills Trailhead	94	53	3	4	49	22	23	0	0	0
	Left-hand Trailhead	43	28	6	0	16	13	7	2	3	2
	Buckingham Park Trailhead	38	23	3	0	15	1	0	0	1	21
	Wonderland Lake Trailhead	359	234	72	1	279	27	47	0	0	6
	Foothills @ Second and Denver	21	17	1	7	16	2	3	0	0	0
	Lefthand Trail @ Pebble Beach Lane	20	12	5	1	16	2	2	0	0	0
	Foothills access to Eagle	39	34	9	13	19	0	20	0	0	0
	Foothills @ Second and Dakota	55	43	12	8	29	0	26	0	0	0
<b>Sub Total November</b>	<b>2,028</b>	<b>1,364</b>	<b>349</b>	<b>102</b>	<b>1,261</b>	<b>281</b>	<b>422</b>	<b>2</b>	<b>7</b>	<b>55</b>	

### Activity Comparison

*Overall.* Hiking was the most prominent activity with the greatest number of visitors recorded in November followed by June and October. Running was the second most recorded activity and was consistent in the fall months with the least in July and August and most overall in June. The number of cyclists was consistent across the study time period (summer and fall seasons) except for June, which had somewhat more cyclists than the other months (Figure 3).



**Figure 3. Overall primary activity counts by month for all sites combined**

Recreation activity category distributions by month, season and type of day are compared in Figures 4a and 4b. Hiking was noted most on a weekend in June (figure 4a) and weekday in November (figure 4b). Running was consistent on weekdays both summer and fall and done much more on a summer weekend in June in comparison with July and August.



### Activity Distributions by Month and Type of Day Summer 2014

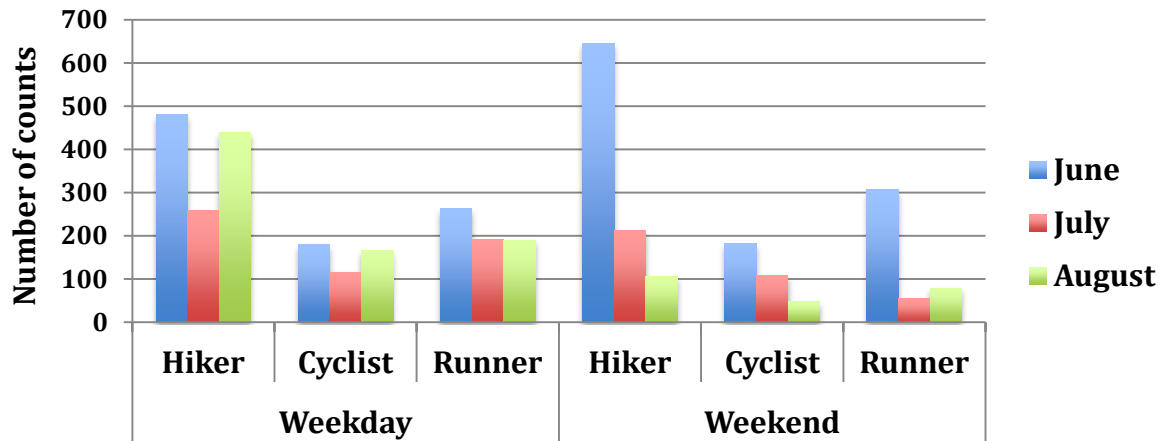


Figure 4a. Activity distributions by month and type of day for summer 2014

### Activity Distributions by Month and Type of Day Fall 2014

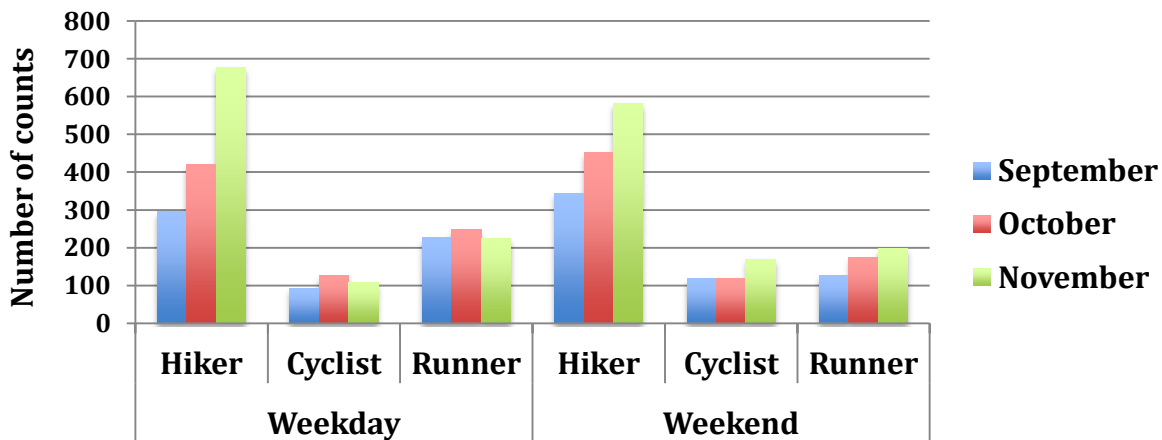


Figure 4b. Activity distributions by month and type of day for fall 2014

#### E. Holidays

The 4<sup>th</sup> of July and Labor Day were the two holidays selected for data collection. Four sites (Wonderland Lake Trail @ Poplar Ave., Fourmile Trailhead, BVR (Sage) Trailhead, Eagle Trailhead) with 4 shifts per day were conducted with neither days or time periods selected at random.

*Overall.* There were more visitors on Labor Day (n=413) versus July 4<sup>th</sup> (n=283) (Table 15). Hikers (194 on Labor Day and 135 on July 4<sup>th</sup>) were the predominant visitor type, followed by cyclists (n=116) and runners (n=102) on Labor Day and runners (n=91) and cyclists (n=57) on July 4<sup>th</sup>. More vehicles were recorded on Labor Day (n=112) versus July 4<sup>th</sup> (n=72). There were 68 dogs on-leash and 8 off-leash on Labor Day and 27 on-leash and 4

off-leash on July 4<sup>th</sup>. None of the locations exceeded parking lot capacity during either holiday observation.

*Site-by-Site.* Wonderland Lake Trail @ Poplar Ave. had the most visitors on both days followed by Fourmile Trailhead on Labor Day and BVR Trailhead on July 4<sup>th</sup>. Wonderland Lake Trailhead @ Poplar Ave. had the most hikers and runners recorded on both days as well as dogs on-leash. The most vehicles noted were at BVR Trailhead (n=46) on Labor Day and on July 4<sup>th</sup> Fourmile Trailhead had the most (n=32).

**Table 15. Total numbers by variable per site and by type of day (Holidays)**

<b>Holiday/ Site</b>	<b># People</b>	<b># Dogs on leash</b>	<b># Dogs off leash</b>	<b># Hikers</b>	<b># Cyclists</b>	<b># Runners</b>	<b># Equestrians</b>	<b># OS</b>	<b># Other</b>	<b># Vehicles</b>	<b># Horse Trailers</b>	<b># High volume vehicles</b>	<b>Parking Lot exceeded</b>
<b>July 4<sup>th</sup></b>													
Wonderland Lake Trail @ Poplar Ave.	131	16	0	60	8	63	0	0	0	0	0	0	No
Fourmile Trailhead	47	1	0	22	13	12	0	0	0	32	0	0	No
BVR (Sage) Trailhead	71	8	2	39	19	13	0	0	0	26	0	0	No
Eagle Trailhead	34	2	2	14	17	3	0	0	0	14	0	0	No
<b>Total</b>	<b>283</b>	<b>27</b>	<b>4</b>	<b>135</b>	<b>57</b>	<b>91</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>72</b>	<b>0</b>	<b>0</b>	<b>No</b>
<b>Labor Day, September 1st</b>													
Wonderland Lake Trail @ Poplar Ave.	223	41	0	107	47	69	0	0	0	0	0	0	No
Fourmile Trailhead	76	9	1	37	32	7	0	0	0	34	0	0	No
BVR (Sage) Trailhead	68	14	1	31	18	18	0	1	0	46	0	0	No
Eagle Trailhead	46	4	6	19	19	8	0	0	0	32	0	0	No
<b>Total</b>	<b>413</b>	<b>68</b>	<b>8</b>	<b>194</b>	<b>116</b>	<b>102</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>112</b>	<b>0</b>	<b>0</b>	<b>No</b>

## ***F. Modes of access to OSMP***

Mode of access to OSMP varied by trailhead and other access points with data captured indirectly via the parking lot counts at 30-minute intervals (parking lot count data is specifically referred to in Section G). An overview of mode of access per site is given in the following section with data referenced from Tables 8 and 9.

Site 1. Wonderland Lake Trail @ Poplar Ave. access – has no designated OSMP parking and the predominant visitors were those incoming from the surrounding residential areas. Hikers, runners, and cyclists in that order was the predominant activity groups and many groups were there walking their dog. This site had the highest visitation observed of the 13 sites.

Site 2. Fourmile Trailhead – a large parking lot was available with no outhouse. There are spaces for approximately 36 vehicles and although the 2<sup>nd</sup> busiest site overall, the parking lot was never full. Runners followed by hikers were the predominant activity groups. Many cars arrived to park, yet the people hiked out of the lot heading north onto the Foothills Trail leading towards the Foothills @ Second and Dakota access point. The parking lot also served as a place for road bikers to park to prepare for road biking along Lee Hill Drive and for equestrian trailer parking.

Site 3. BVR (Sage) Trailhead - this is 4<sup>th</sup> busiest site overall with hikers as the main activity group followed by runners and cyclists. Many more cars came to this site to gain access to the area for walking their dog, hiking and biking than the other sites. A good percentage of through hikers, runners and bikers were also noted due to the BVR Trailhead's central location and the parking area serving as a cross roads for several trails. The outhouse facility is used often and the parking area was noted to exceed capacity on a few occasions although not as much as might be expected.

Site 4. Eagle Parking Coffee – has no designated parking lot but does have an informal parking area along the end of the access road (North Broadway). A mix of hikers and dog walkers, cyclists, and runners primarily access this site.

Site 5. Eagle Trailhead – is a large parking lot that can accommodate 20 plus cars, horse trailers and high occupancy vehicles. This site is the 5<sup>th</sup> busiest overall with a similar number of hikers and cyclists followed by runners.

Site 6. Foothills Trailhead – is a small parking area for 12 to 15 cars that ranks 6<sup>th</sup> busiest in the fall and 8<sup>th</sup> or 9<sup>th</sup> in the summer season. Runners are the most represented with many runners passing through the area (not accessing a vehicle in the lot).

Site 7. Lefthand Trailhead - has a large parking lot to accommodate large vehicles, horse trailers and other high occupancy vehicles. The area is not visited much and the primary activity group represented was cyclists.

Site 8. Buckingham Park Trailhead - car access followed by cyclists are the predominant modes of access (many just stopover to use the facilities).

Site 9. Wonderland Lake Trailhead –is the 3<sup>rd</sup> busiest site overall and the primary activity represented was hikers. Many visitors who come here are accessing the trail from the local

neighborhood similar to Wonderland Lake Trail @ Poplar Ave. There are also a moderate number of runners visiting this trail.

Site 10. Foothills @ Second and Denver – there is parking along Denver Street near the access point. Hiking is the predominant access mode (few visitors park here) with limited visitation overall.

Site 11. Lefthand Trail @ Pebble Beach Lane – has no designated OSMP parking. This location is accessed via an easement behind a row of houses on Pebble Beach Lane. This access point had the least number of visitors and is primarily visited by people coming from the local neighborhood. The access trail is difficult to find between houses off Pebble Beach Lane. Hiking was the predominant mode of access.

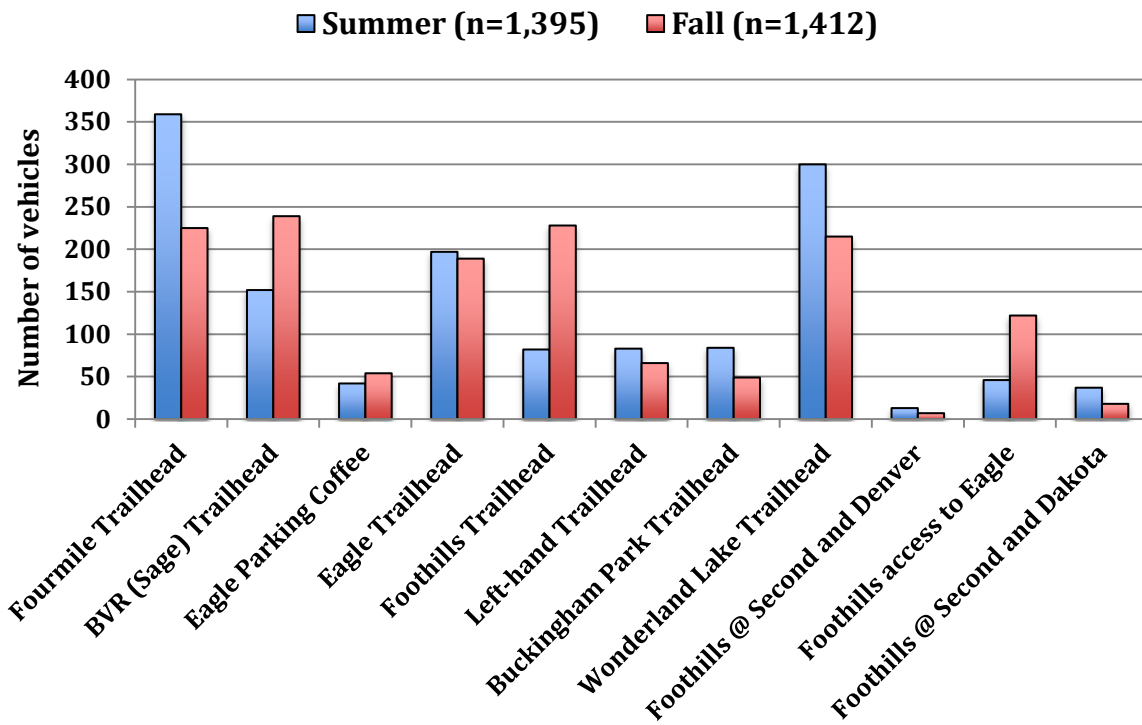
Site 12. Foothills access to Eagle – has informal parking along North Broadway. This location has fairly low visitation with some runners and hikers, many of whom come by car to walk their dog(s).

Site 13. Foothills @ Second and Dakota – ranks 10<sup>th</sup> for number of visitors. Hikers and runners represent a similar visitation distribution. Most of the access trail visitors tend to be people coming from the neighborhood. Hikers and runners were the most prominent activity types both summer and fall. Some visitors come to park in the few designated spots along the street to access the trail.

### ***G. Parking***

Parking lot counts were taken at 30-minute intervals both summer (7 a.m. to 8 p.m.) and fall (7 a.m. to 7 p.m. and adjusted to daylight hours each month) seasons. Because total counts were taken at 30-minute intervals vehicles could be counted more than once per 2-hour monitoring period. Parking counts were taken at 11 of the 13 sites with no counts taken at Wonderland Lake Trail @ Poplar Ave. or Lefthand Trail @ Pebble Beach Lane (no associated parking). Site location descriptions are given in Appendix C.

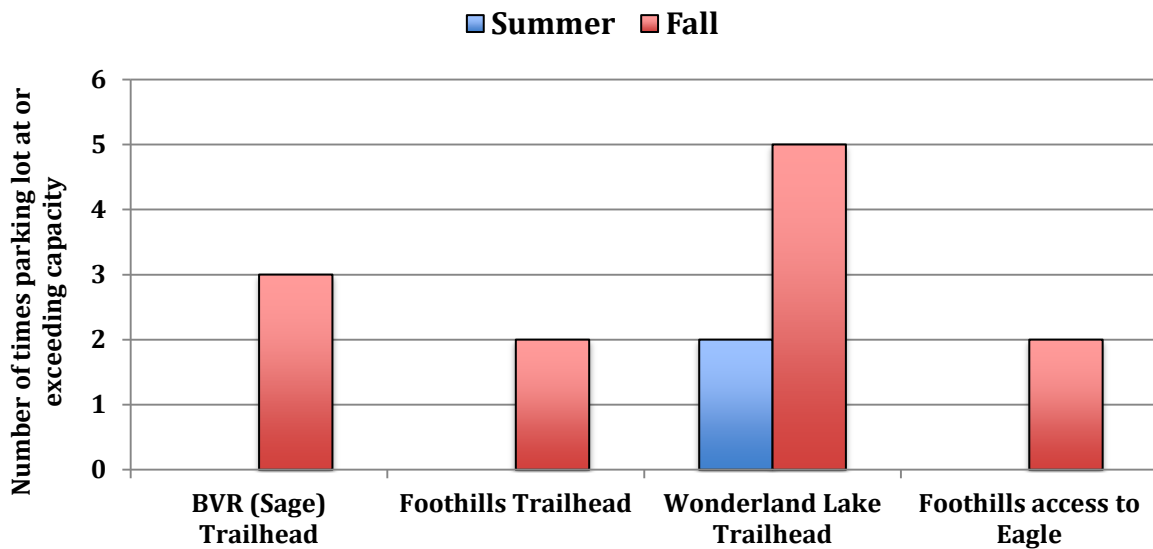
Total vehicle counts for both summer (n=1,395) and fall (n=1,412) were similar. Figure 5 shows the total vehicle counts by site for summer and fall with Fourmile Trailhead having the most vehicles overall in the summer followed by Wonderland Lake Trailhead. Fall total counts for Fourmile, BVR, Eagle, Foothills, and Wonderland Lake Trailheads were similar (approximately 200 cars). Count distributions across the monitoring periods for each of the 11 sites with parking areas are given in Appendix G1 and G2.



**Figure 5. Total number of vehicles by summer and fall seasons per observation site**

Across the entire study area and all monitoring periods, parking capacity was exceeded a total of 14 times. Wonderland Lake Trailhead parking capacity was exceeded two times (only site in the summer months). In the fall season, BVR Trailhead parking capacity was exceeded three times, Foothills Trailhead twice, Wonderland Lake Trailhead five times, and Foothills access to Eagle twice. In general, there is presently not a regular parking problem at NTSA trailhead/access points, except for perhaps BVR and Wonderlands Lake Trailheads on select days (Figure 6).

For an understanding of the complete parking dataset, see the parking distribution tables (Appendix G) that give a summer by fall comparison of the vehicle count distributions at 30-minute time intervals per site. Note that vehicles could be counted more than once (up to 4 times) per monitoring period if the vehicles remained in the parking for the 2-hour period.



**Figure 6. Number of times parking lot was at or exceeding capacity**

### **Horse trailers and large occupancy vehicles**

Six large occupancy vehicles (i.e. 10-15 passenger vans) (three at Fourmile Trailhead and three at Wonderland Lake Trailhead) and ten horse trailers (three at Eagle Trailhead and seven at Lefthand Trailhead) were counted during the summer 2014 data collection period. For the fall data collection period, there were a total of nine horse trailers observed (four at Fourmile Trailhead<sup>8</sup>, two at Lefthand Trailhead and two at Eagle Trailhead) with no large occupancy vehicles recorded.

### **Parking Comments**

For the summer data, observers recorded a total of 30 comments with some written statements referring to people sitting in the car for lunch or to talk on the phone, or parking outside the fence at BVR Trailhead because the lot was full, a van waiting for people, motorcycles parking, started to rain, or people parking to use a trail other than the one under observation (which is the case at BVR and Fourmile Trailheads specifically). One church van was noted sitting in the lot with the driver inside. References were made to OSMP vehicles coming to do maintenance or work in the field. For the fall data, there were 23 comments total with similar responses to the summer comments along with some more specific to the snow day in November.

### **H. Weather**

Weather conditions were recorded for each two-hour shift (Table 15). The weather, per shift for summer and fall, was similar with clear skies 66% to 68% percent of the time and 4% or less completely overcast days. Average temperatures were 75 degrees in the summer and 57 degrees in the fall. Only 5 lightning periods were recorded in the summer. It was slightly breezier in the fall months. There was just one snow day reported in the fall. On November

<sup>8</sup> The 4 horse trailers counted at Fourmile Trailhead during the fall were actually just one trailer parked in the lot on the same day counted four times on that day at 30-minute intervals.

10, 2014, the temperature dropped from 65 degrees at 9 a.m. to 35 degrees in one hour falling below zero by the afternoon with up to six inches of snow by late afternoon.

**Table 16. Weather conditions overall**

<b>Weather Variable</b>	<b>Summer</b>		<b>Fall</b>	
<b><i>Temperature in degrees Fahrenheit</i></b>				
Minimum		50		16
Maximum		95		90
Range		45		74
Average		74.8		57.3
Standard Deviation		9.9		16.1
<b><i>Sky Cover</i></b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
Clear/sunny	79	66	68	68
Partly cloudy/overcast	36	30	29	29
Completely overcast	5	4	3	3
<b>Total</b>	<b>120</b>	<b>100%</b>	<b>100</b>	<b>100%</b>
<b><i>Lighting</i></b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
No	115	96	100	100%
Yes	5	4	---	---
<b><i>Precipitation</i></b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
None	108	89	95	95
Slight mist	8	9	4	4
Steady Rain	4	2	---	---
Snow	---	---	1	1
<b>Total</b>	<b>120</b>	<b>100%</b>	<b>100</b>	<b>100%</b>
<b><i>Wind Conditions</i></b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
Slight Breeze	107	90	72	72
Breezy	11	7	18	19
Windy	2	3	8	8
Severe wind	0	0	1	1
<b>Total</b>	<b>120</b>	<b>100%</b>	<b>100</b>	<b>100%</b>



### III. Conclusions

The purpose of this study was to understand current visitation levels and parking capacity across 13 selected trailheads and access points within the NTSA. Data were collected via direct observation from June-November 2014.

Frequency distributions were determined for the number of visitors, number of groups, number of dogs on-leash, number of dogs off-leash, and activity group types segmented by time period (a.m., midday, p.m.), type of day (weekend vs. weekday) and month (June to November), with a comparison between summer and fall months to depict seasonal differences. A complete overview of data collected for each variable per observation site for both seasons is given in Appendix H.

#### Visitation distribution highlights

##### *Overall*

There were more visitors in the fall (n=4,851) than summer (n=4,146).

##### *Time Period*

Of the 4,146 visitor counts for all 13 sites in the summer season, the a.m. period had the most visitor counts (n=1,710), followed by p.m. (n=1,401), and the least were recorded at mid-day (n=1,035). This differed slightly during the fall season (n=4,851) with more visitors in the p.m. (n=1,763) followed by mid-day (n=1,643), and a.m. (n=1,445).

##### *Day of Week*

In the summer season, there were 2,366 visitors on the weekdays and 1,780 on the weekends. For the fall season, there were 2,522 weekday visitors and 2,329 for the weekend.

##### *Month*

The month of June had the most visitor counts (n= 2,114) followed by August (n=1,072) and July (n=960) in the summer season while November (n=2,028) had the most counts in the fall season followed by October (n=1,581) and September (n=1,242).

- Wonderland Lake Trail @ Poplar Ave. had the most counts in June and November while Fourmile Trailhead had the most in October (n=344). BVR Trailhead had its most counts in July (n=248) and October (n=172) and November (n=233).

##### *Site-by-Site Visitation*

Site 1. Wonderland Lake Trail @ Poplar Ave. was the busiest site overall especially in the a.m. from 8 a.m. to 11 a.m., and this site had a significant decrease from 1 p.m. to 4 p.m. (summer season). Fall season visitation typically picked up later (10 a.m.), gradually increased through 1 p.m., dropped off slightly midday, had a peak at 4 p.m. and then dropped off to a constant rate from 5 to 7 p.m.

Site 2. Fourmile Trailhead had a similar pattern of visitors during summer and fall seasons except for a greater number of visitors at 8 a.m. during the fall and a greater number at 1 p.m. in the summer.

Site 3. BVR Trailhead visitation was highest in mid-morning summer (10 a.m.) with a gradual decline through 2 p.m. During the fall season, the busiest time overall appeared to be from 3 to 4 p.m.

Site 4. Eagle Parking Coffee had more visitor counts in the summer than fall. Peak visitation was summer 10 a.m. to 11 a.m. Fall visitation was more consistent in numbers in the morning and mid-day than in the summer with peak fall visitation overall between 5 and 6 p.m.

Site 5. Eagle Trailhead had similar visitation numbers during both summer and fall seasons. Ten a.m. was the peak hour in the summer while 1 p.m. was the peak time in the fall.

Site 6. Foothills Trailhead visitor counts were significantly more in the fall than summer. Summer season between 8 and 10 a.m. had slight increases in visitor counts. The summer season had two peaks (10 a.m. and 7 p.m.) while there was a more consistent range of visitor counts between 1 p.m. and 6 p.m. in the fall.

Site 7. Lefthand Trailhead had slightly more visitors in the fall than summer. There were no counts taken in the summer from 6 to 8 p.m. and none during the fall evening shift as well. Peak summer visitation overall was at 8 a.m. and there was no visitation recorded in the fall between 8 a.m. and 10 a.m. There were also no fall visitors between 1 and 2 p.m. with 3 to 5 p.m. representing the peak fall counts taken.

Site 8. Buckingham Park Trailhead visitation was very limited with a few picnickers; many people stop to access the outhouse or to use the trash containers. During the fall months, many visitors came just for the outhouse or to sit in the parking lot in their car having lunch. There were also some road bikers on Lefthand Canyon Drive that would stop by to use the outhouse and walk to Lefthand Creek.

Site 9. Wonderland Lake Trailhead had more a.m. visitors in the summer than fall; yet, fall counts were greater overall with the busiest time between 3 and 4 p.m.

Site 10. Foothills @ Second & Denver was visited slightly more in the fall than summer season, yet with similar visitation patterns during the a.m. and p.m. monitoring periods.

Site 11. Visitation to the Lefthand Trail @ Pebble Beach Lane access was very limited with 54 visitors recorded in the summer and only 24 in the fall season. Most of the visitors observed accessed the trail from Lefthand Trail and were not observed on the access trail that runs behind the Pebble Beach Lane houses (see Figure 1 for Lefthand trail location and Appendix C for Lefthand Trail @ Pebble Beach Lane description).

Sites 12 & 13. Foothills access to Eagle is busier in the fall than summer months while the reverse is noted for Site 13 Foothills @ 2<sup>nd</sup> and Dakota – which is mostly visited by people coming from the local neighborhood.

### **Dogs on versus off-leash highlights**

#### *Overall*

Across the entire study period (summer and fall), the total number of dogs observed on-leash was 1,295 versus 505 that were observed off-leash. More dogs on-leash were noted in the fall

(n=787) months than summer months (n=509) with more also off-leash in the fall (n=326) versus the summer (n=179). Monitoring sites that have leash required regulations are: Wonderland Lake Trail @ Poplar Ave, Fourmile Trailhead, Lefthand Trailhead, Buckingham Park Trailhead, Wonderland Lake Trailhead, and Lefthand Trail @ Pebble Beach Lane.

### *Time Periods*

During the summer season, the most dogs off-leash tend to be at BVR Trailhead during mid-day and p.m. with slightly more at Eagle Parking Coffee in the a.m. (both voice and sight control regulated areas). In the fall season, Eagle Parking Coffee had the most off-leash in the a.m. and BVR Trailhead at mid-day with more off-leash at Foothills access to Eagle in the p.m. All trailheads require dogs on-leash within the Trailhead Leash regulation zone, but not once the dog and guardian have entered the voice and sight control designated area (typically just beyond the access gate) – not all areas have voice and sight control as a designated option. Some people just let their dog out of the car to immediately walk to the gate (i.e., BVR Trailhead) and enter the area.

### *Day of Week*

There were a total of 711 dogs on-leash recorded in the summer and fall on weekdays and 585 on-leash on weekends. Overall, 326 dogs were off-leash in the fall and 179 in the summer months. Of the 505 total dogs observed off-leash, there were 296 dogs off-leash on the weekdays and 209 on the weekends.

### *Month*

Across all study months, November (n=349) was noted for the most dogs on-leash followed by October (n=274) and June (n=252). Meanwhile, the most dogs sighted off-leash was in October (n=157).

### *Site-by-Site*

For areas with voice and sight control regulations, an average of 49% of observed dogs were off-leash. The Eagle Parking Coffee site had the highest average proportion of off-leash dogs (63%), followed by Foothills access to Eagle. Voice and sight control areas with the lowest proportions of off-leash dogs were BVR Trailhead and Foothills @ Second and Dakota.

For areas that require leashes, dogs off-leash were observed the most at Wonderland Lake Trail @ Poplar Ave. (4 or 5 times in June, October, and November and a couple of times the other months) followed by Wonderland Lake Trailhead with a few dogs sighted off-leash in the fall months. Five dogs were off-leash at Fourmile Trailhead in June. Only one dog was recorded off-leash at Buckingham Park Trailhead overall. These off-leash observations within leash required areas represent visitor non-compliance with the leash regulation.

## **Activity type**

### *Overall*

For total activity counts, fall season counts were greater (n=4,847) than the summer season (n=4,125) for all activity types combined. For activity type, hiking represented the activity category done most between fall (n=2,775) and summer seasons (n=2,144) followed by runners (summer, n=1,085 and fall, n=1199), and cyclists (summer, n=795 and fall, n=733). More equestrians (n=24) and OS personnel (n=30) were recorded in the summer than fall

season; but in general, observed equestrian activity was limited to BVR Trailhead, Lefthand Trailhead, Foothills access to Eagle, and Eagle Trailhead.

#### *Time Period*

The time period with the most activity counts for all activities combined was fall season p.m. (n=1,762) overall followed by summer season a.m. (n=1,707). Summer season mid-day counts were 1,035 and p.m. counts 1,383 for all activities combined. Fall a.m. activity counts were 1,445 and mid-day was 1,640 for all activities combined.

- *Site-by-Site* The a.m. period was the heaviest visitation period in the summer at Wonderland Lake Trail @ Poplar Ave. and this site had more hikers at mid-day in the fall months. A similar a.m. pattern was found for runners both summer and fall. In the summer and fall seasons, the most cyclists were noted at Wonderland Lake Trail @ Poplar Ave., Fourmile, Eagle and Wonderland Lake Trailheads and the most cyclists overall were recorded in the summer months (n=795) versus fall (n=733). Across all the time periods, cyclist visitation was recorded more during mid-day and p.m. in the fall months while a more equal distribution of cyclists across all three time periods was noted in the summer season.

#### *Day of Week*

Hiking was recorded less on summer weekdays (n=1,180) than fall weekdays (n=1,394), and there were also less summer weekend hikers (n=964) than in the fall (n=1,381). For cycling, there were more summer weekday cyclists (n=460) than fall weekday (n=326) with a reverse pattern for weekends (335 summer vs. 407 fall). There were 645 runners recorded on summer weekdays, 700 on fall weekdays, 440 on summer weekends and 499 runners on fall weekends.

#### *Month*

Hiking was the most prominent overall activity with the most visitors recorded in November followed by June and October. Running was the second most recorded activity with consistent numbers in the fall months and with the least numbers in July and August along with the most overall in June. The number of cyclists was consistent across each month except for June when there was slightly more cyclists than during the other months. Hiking was noted most on a weekend in June and weekday in November. Running was consistent on weekdays both summer and fall and done much more on a summer weekend in June in comparison with July and August.

#### *Site-by-Site*

Highlights of the three primary activity types are given with data drawn from Tables 8 and 9.

Hikers - During the summer season, the most hikers were noted at Wonderland Lake Trail @ Poplar Ave. (n=599) followed by Wonderland Lake Trailhead (n=361) and Fourmile Trailhead (n=281) and BVR Trailhead (n=175). For the fall season, the pattern was similar: Wonderland Lake Trail @ Poplar Ave. (n=802) followed by Wonderland Lake Trailhead (n=549) and Fourmile Trailhead (n=379) and BVR Trailhead (n=324).

Cyclists – During the summer season, the most cyclists were noted at Fourmile Trailhead (n=139) followed by Wonderland Lake Trail @ Poplar Ave. (n=129), and Eagle Trailhead (n=113). For the fall season, Wonderland Lake Trail @ Poplar Ave. (n=173) had the most cyclists followed by Eagle Trailhead (n=114) and Fourmile and BVR Trailheads with the same number of cyclists (n=97).

Runners – During the summer season, the most runners were recorded at Wonderland Lake Trail @ Poplar Ave. (n=368) followed by Fourmile (n=190) and Wonderland Lake Trailheads (n=122). For the fall season, the number of runners at Wonderland Lake Trail @ Poplar Ave. (n=303) followed by Fourmile (n=304) was similar while Foothills access to Eagle (n=109) had the third most runners recorded.

### **Modes of Access**

Site 1. Wonderland Lake Trail @ Poplar Ave. access – the predominant visitors were those from the surrounding residential areas (no designated parking area). Hikers, runners, and cyclists in that order were the predominant activity groups and many visitors had a dog or dogs with them on the day of the observation. This site is the most visited access point of the 13 sites.

Site 2. Fourmile Trailhead – a large parking lot was available with no outhouse. There are spaces for approximately 36 vehicles and although the 2<sup>nd</sup> busiest site, the parking lot was never full. Runners followed by hikers were the predominant activity groups. Many cars arrived to park, then hike out of the lot heading north onto the Foothills Trail leading towards Foothills @ Second and Dakota. The parking lot also served as a place for road bikers to park to prepare for road biking along Lee Hill Drive.

Site 3. BVR (Sage) Trailhead - this is the 4<sup>th</sup> busiest site with hikers as the main activity group followed by runners and cyclists. Many more visitors arrived by car to this site to gain access to the area for walking their dog, hiking and some bikers than the other sites. However, a good percentage of through hikers, runners and bikers were noted due to the BVR's central location and as a cross roads for several different trails. The outhouse facility is used often and the parking area was noted to exceed capacity on a few occasions although not as much as might be expected.

Site 4. Eagle Parking Coffee – has no designated parking lot but does have informal parking along North Broadway Street. A mix of hikers and dog walkers, cyclists, and runners primarily visit this site.

Site 5. Eagle Trailhead – is a large parking lot that can accommodate 20 plus cars, high occupancy vehicles and horse trailers. This site is the 5<sup>th</sup> busiest with a similar number of hikers and cyclists followed by runners.

Site 6. Foothills Trailhead – is a small parking area for 12 to 15 cars that ranks 6<sup>th</sup> busiest in the fall and 8<sup>th</sup> or 9<sup>th</sup> in the summer. Runners are the most represented with many runners passing through (not parking a vehicle at the site).

Site 7. Lefthand Trailhead - has a large parking lot to accommodate large vehicles, horse trailers and other high occupancy vehicles. The area is not visited very often and the primary activity group represented was cyclists.

Site 8. Buckingham Park Trailhead - Car access followed by cyclists are the predominant modes of access to this site.

Site 9. Wonderland Lake Trailhead –is the 3<sup>rd</sup> busiest site with primarily hikers; many who come from the local neighborhood similar to Wonderland Lake Trail @ Poplar Ave. There are also a moderate number of runners visiting this trail.

Site 10. Foothills @ Second and Denver – there is parking along Denver Street near the access point. Hiking is the predominant access mode with limited visitation overall.

Site 11. Lefthand Trail @ Pebble Beach Lane – no designated parking. This site is accessed via private property and an easement behind a row of houses on Pebble Beach Lane. This access point had the least number of visitors and is primarily visited by people coming from the local neighborhood. Hiking was the predominant mode of access.

Site 12. Foothills access to Eagle – low level of visitation with some runners and hikers, many of whom come by car to walk their dog(s).

Site 13. Foothills @ Second and Dakota –ranks 10<sup>th</sup> for number of visitors. Hikers and runners represent a similar visitation pattern. Most of the access trail visitors tend to be people coming from the neighborhood.

### **Holidays**

For the holidays, there were 696 total visitors recorded for July 4<sup>th</sup> (n=283) and Labor Day (n=413) across four sites: Wonderland Lake Trail @ Poplar Ave. (n=354), Fourmile Trailhead (n=123), BVR (n=139) and Eagle Trailhead (n=80).

Hikers (n=194 on Labor Day and n=135 on July 4<sup>th</sup>) were the predominant visitor type, followed by cyclists (n=116) and runners (n=102) on Labor Day and runners (n=91) and cyclists (n=57) on July 4<sup>th</sup>. More vehicles were recorded on Labor Day (n=112) versus July 4<sup>th</sup> (n=72). There were 68 dogs on-leash and 8 off-leash on Labor Day and 27 on-leash and 4 off-leash on July 4<sup>th</sup>. The number of vehicles counted was 112 vehicles on Labor Day and 72 on July 4<sup>th</sup>. None of the parking lot capacities were exceeded on the holidays.

*Site-by-Site.* Wonderland Lake Trail @ Poplar Ave. had the most visitors on both days followed by Fourmile Trailhead on Labor Day and BVR on July 4<sup>th</sup>. Wonderland Lake Trailhead @ Poplar Ave. had the most hikers and runners recorded on both days as well as dogs on-leash. The most vehicles noted were at BVR Trailhead (n=46) on Labor Day. On July 4<sup>th</sup> Fourmile Trailhead had the most vehicle counts (n=32).

### **Parking**

Total vehicle counts for both summer and fall seasons were similar. Across the entire study area and all monitoring periods, parking capacity was exceeded a total of 14 times. Wonderland Lake Trailhead parking capacity was exceeded two times (only site in the summer months). In the fall, BVR parking capacity was exceeded three times, Foothills Trailhead twice, Wonderland Lake Trailhead five times, and Foothills access to Eagle twice. In general, there is presently not a regular parking problem at NTSA trailhead/access points, except for perhaps BVR and Wonderlands Lake Trailheads on select days

**Weather**

Weather was not a major factor influencing visitation at NTSA locations. Visitation rates were lower during peak temperature periods as expected, especially during the mid-day summer time period. Lightning, severe windy conditions, rain and snow conditions were limited across the sample days.

**Recommendations**

An onsite automated monitor of visitation is a useful tool to determine visitation levels across all 24 hours of a day at designated trailheads and access areas in the NTSA. In future studies, recommendations are to include automated infrared monitors to supplement onsite counts as well as a random selection of onsite interviews or surveys. Such data can add greater depth of understanding of visitor demographics, reasons for visiting OSMP, and overall visitation behavior.

## Works Cited

- City of Boulder, Open Space and Mountain Parks 3013-2018 Capital Improvement Program [https://www-static.bouldercolorado.gov/docs/09\\_Open\\_Space\\_and\\_Mountain\\_Parks-1-201305241111.pdf](https://www-static.bouldercolorado.gov/docs/09_Open_Space_and_Mountain_Parks-1-201305241111.pdf) , p. 225. [Retrieved March 28, 2014].
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### Appendix A. NTSA visitation monitor datasheet

Date/Day of Week:		Start time:	End time:	Observer:	Location:	Page ____ of ____								
Temperature at start (farenheit):		Wind: <i>circle all that apply</i> Slight breeze Breezy Windy Severe Wind		Precipitation: <i>circle all that apply</i> None Slight mist Steady rain Heavy rain Snow	Sky cover: <i>circle all that apply</i> Clear/sunny Partly cloudy/overcast Completely overcast	Lightning: <i>circle one</i> Yes No								
A visitor party is any recreation group that in the best judgement of the observer is intentionally travelling together; record every party that passes the sample point including all directions of travel	Time; record every half hour and record parking lot data	Visitor Party ID; sequential starting with "1"	Visitor Party Counts (0-n)				Fields to the right are for parking lot counts only; conduct every half hour; empty cells are expected between parking lot observations	Parking Lot Counts Every Half Hour				Parking Lot Notes; note if visitors are parking outside parking lot		
			Number of People / Activity Type		Number of Dogs			Enter additional notes at bottom of datasheet; note party ID						
			No.	Activity (H, B, R, E, C, OS)	On-leash	Off-leash		Visitor Party Notes						
			Shift Notes:											

Activity codes	
H	Hiker
B	Cyclist
R	Runner
E	Equestrian
C	Climber
OS	Open space staff/volunteer
OTH	Other-define in notes

Site numbers and names	
1	Wonderland Lake Trail @ Poplar Ave.
2	Fourmile Trailhead
3	BVR (Sage) Trailhead
4	Eagle Parking Coffee
5	Eagle trailhead
6	Foothills Trailhead
7	Left-hand Trailhead
8	Buckingham Park
9	Wonderland Lake Trailhead
10	Foothills @ Second and Denver
11	Lefthand Trail @ Pebble Beach Lane
12	Foothills access to Eagle
13	Foothills @ Second and Dakota

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**RETURN DATASHEETS** at least monthly to Deonne or Jennelle @ OSMP Cherryvale Administration (66 S. Cherryvale Rd. Boulder CO 80303 or drop off at Ranger Cottage

Developed by Deonne VanderWoude

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## Appendix B. NTSA Sample schedule

Summer Season 2014

<b>Location</b>	<b>Date</b>
Wonderland Lake Trail @ Poplar Ave	1-Jun-14
Wonderland Lake Trail @ Poplar Ave	2-Jun-14
Wonderland Lake Trail @ Poplar Ave	19-Jun-14
Wonderland Lake Trail @ Poplar Ave	24-Jun-14
Wonderland Lake Trail @ Poplar Ave	29-Jun-14
Wonderland Lake Trail @ Poplar Ave	18-Jul-14
Wonderland Lake Trail @ Poplar Ave	25-Jul-14
Wonderland Lake Trail @ Poplar Ave	21-Aug-14
Wonderland Lake Trail @ Poplar Ave	30-Aug-14
Fourmile Trailhead	1-Jun-14
Fourmile Trailhead	1-Jun-14
Fourmile Trailhead	1-Jun-14
Fourmile Trailhead	2-Jun-14
Fourmile Trailhead	1-Jul-14
Fourmile Trailhead	18-Jul-14
Fourmile Trailhead	25-Jul-14
Fourmile Trailhead	12-Aug-14
Fourmile Trailhead	21-Aug-14
BVR (Sage) Trailhead	2-Jun-14
BVR (Sage) Trailhead	4-Jun-14
BVR (Sage) Trailhead	7-Jun-14
BVR (Sage) Trailhead	1-Jul-14
BVR (Sage) Trailhead	12-Jul-14
BVR (Sage) Trailhead	18-Jul-14
BVR (Sage) Trailhead	20-Jul-14
BVR (Sage) Trailhead	15-Aug-14
BVR (Sage) Trailhead	25-Aug-14
Eagle Parking Coffee	4-Jun-14
Eagle Parking Coffee	7-Jun-14
Eagle Parking Coffee	1-Jul-14
Eagle Parking Coffee	7-Jul-14
Eagle Parking Coffee	18-Jul-14
Eagle Parking Coffee	26-Jul-14
Eagle Parking Coffee	19-Aug-14
Eagle Parking Coffee	24-Aug-14
Eagle Parking Coffee	25-Aug-14
Eagle Trailhead	1-Jun-14

<b>Location</b>	<b>Date</b>
Eagle Trailhead	13-Jun-14
Eagle Trailhead	14-Jun-14
Eagle Trailhead	1-Jul-14
Eagle Trailhead	5-Jul-14
Eagle Trailhead	23-Jul-14
Eagle Trailhead	6-Aug-14
Eagle Trailhead	12-Aug-14
Eagle Trailhead	21-Aug-14
Foothills Trailhead	1-Jun-14
Foothills Trailhead	2-Jun-14
Foothills Trailhead	17-Jun-14
Foothills Trailhead	24-Jun-14
Foothills Trailhead	29-Jun-14
Foothills Trailhead	2-Jul-14
Foothills Trailhead	12-Jul-14
Foothills Trailhead	23-Jul-14
Foothills Trailhead	6-Aug-14
Lefthand Trailhead	14-Jun-14
Lefthand Trailhead	24-Jun-14
Lefthand Trailhead	2-Jul-14
Lefthand Trailhead	12-Jul-14
Lefthand Trailhead	26-Jul-14
Lefthand Trailhead	6-Aug-14
Lefthand Trailhead	18-Aug-14
Lefthand Trailhead	21-Aug-14
Lefthand Trailhead	25-Aug-14
Buckingham Park Trailhead	4-Jun-14
Buckingham Park Trailhead	7-Jun-14
Buckingham Park Trailhead	13-Jun-14
Buckingham Park Trailhead	2-Jul-14
Buckingham Park Trailhead	12-Jul-14
Buckingham Park Trailhead	13-Jul-14
Buckingham Park Trailhead	12-Aug-14
Buckingham Park Trailhead	25-Aug-14
Wonderland Lake Trailhead	4-Jun-14
Wonderland Lake Trailhead	8-Jun-14
Wonderland Lake Trailhead	8-Jun-14
Wonderland Lake Trailhead	17-Jun-14
Wonderland Lake Trailhead	2-Jul-14
Wonderland Lake Trailhead	12-Jul-14

<b>Location</b>	<b>Date</b>
Wonderland Lake Trailhead	18-Aug-14
Wonderland Lake Trailhead	18-Aug-14
Wonderland Lake Trailhead	25-Aug-14
Foothills @ Second and Denver	8-Jun-14
Foothills @ Second and Denver	22-Jun-14
Foothills @ Second and Denver	24-Jun-14
Foothills @ Second and Denver	7-Jul-14
Foothills @ Second and Denver	2-Aug-14
Foothills @ Second and Denver	10-Aug-14
Foothills @ Second and Denver	25-Aug-14
Foothills @ Second and Denver	26-Aug-14
Lefthand Trail @ Pebble Beach Lane	2-Jun-14
Lefthand Trail @ Pebble Beach Lane	2-Jun-14
Lefthand Trail @ Pebble Beach Lane	13-Jun-14
Lefthand Trail @ Pebble Beach Lane	15-Jun-14
Lefthand Trail @ Pebble Beach Lane	15-Jun-14
Lefthand Trail @ Pebble Beach Lane	7-Jul-14
Lefthand Trail @ Pebble Beach Lane	25-Jul-14
Lefthand Trail @ Pebble Beach Lane	2-Aug-14
Lefthand Trail @ Pebble Beach Lane	21-Aug-14
Foothills access to Eagle	13-Jun-14
Foothills access to Eagle	15-Jun-14
Foothills access to Eagle	15-Jun-14
Foothills access to Eagle	24-Jun-14
Foothills access to Eagle	7-Jul-14
Foothills access to Eagle	25-Jul-14
Foothills access to Eagle	1-Aug-14
Foothills access to Eagle	6-Aug-14
Foothills access to Eagle	24-Aug-14
Foothills @ Second and Dakota	12-Jun-14
Foothills @ Second and Dakota	20-Jun-14
Foothills @ Second and Dakota	20-Jun-14
Foothills @ Second and Dakota	29-Jun-14
Foothills @ Second and Dakota	29-Jun-14
Foothills @ Second and Dakota	2-Jul-14
Foothills @ Second and Dakota	13-Jul-14
Foothills @ Second and Dakota	12-Aug-14
Foothills @ Second and Dakota	18-Aug-14

Fall Season 2014

<b>Location</b>	<b>Date</b>
Wonderland Lake Trail @ Poplar Ave	20-Sep-14
Wonderland Lake Trail @ Poplar Ave	24-Sep-14
Wonderland Lake Trail @ Poplar Ave	26-Sep-14
Wonderland Lake Trail @ Poplar Ave	26-Oct-14
Wonderland Lake Trail @ Poplar Ave	31-Oct-14
Wonderland Lake Trail @ Poplar Ave	18-Nov-14
Wonderland Lake Trail @ Poplar Ave	26-Nov-14
Wonderland Lake Trail @ Poplar Ave	28-Nov-14
Wonderland Lake Trail @ Poplar Ave	29-Nov-14
Fourmile Trailhead	24-Sep-14
Fourmile Trailhead	29-Sep-14
Fourmile Trailhead	13-Oct-14
Fourmile Trailhead	13-Oct-14
Fourmile Trailhead	18-Oct-14
Fourmile Trailhead	31-Oct-14
Fourmile Trailhead	1-Nov-14
Fourmile Trailhead	16-Nov-14
Fourmile Trailhead	26-Nov-14
BVR (Sage) Trailhead	15-Sep-14
BVR (Sage) Trailhead	20-Sep-14
BVR (Sage) Trailhead	3-Oct-14
BVR (Sage) Trailhead	13-Oct-14
BVR (Sage) Trailhead	30-Oct-14
BVR (Sage) Trailhead	31-Oct-14
BVR (Sage) Trailhead	8-Nov-14
BVR (Sage) Trailhead	16-Nov-14
BVR (Sage) Trailhead	18-Nov-14
Eagle Parking Coffee	3-Sep-14
Eagle Parking Coffee	5-Sep-14
Eagle Parking Coffee	20-Sep-14
Eagle Parking Coffee	22-Sep-14
Eagle Parking Coffee	18-Oct-14
Eagle Parking Coffee	29-Oct-14
Eagle Parking Coffee	31-Oct-14
Eagle Parking Coffee	7-Nov-14
Eagle Parking Coffee	16-Nov-14
Eagle Trailhead	15-Sep-14
Eagle Trailhead	25-Sep-14
Eagle Trailhead	5-Oct-14

<b>Location</b>	<b>Date</b>
Eagle Trailhead	31-Oct-14
Eagle Trailhead	6-Nov-14
Eagle Trailhead	7-Nov-14
Eagle Trailhead	9-Nov-14
Eagle Trailhead	17-Nov-14
Eagle Trailhead	23-Nov-14
Foothills Trailhead	23-Sep-14
Foothills Trailhead	6-Oct-14
Foothills Trailhead	13-Oct-14
Foothills Trailhead	18-Oct-14
Foothills Trailhead	28-Oct-14
Foothills Trailhead	29-Oct-14
Foothills Trailhead	9-Nov-14
Foothills Trailhead	23-Nov-14
Foothills Trailhead	25-Nov-14
Lefthand Trailhead	14-Sep-14
Lefthand Trailhead	20-Sep-14
Lefthand Trailhead	23-Sep-14
Lefthand Trailhead	3-Oct-14
Lefthand Trailhead	30-Oct-14
Lefthand Trailhead	16-Nov-14
Lefthand Trailhead	19-Nov-14
Lefthand Trailhead	25-Nov-14
Lefthand Trailhead	28-Nov-14
Buckingham Park Trailhead	3-Sep-14
Buckingham Park Trailhead	15-Sep-14
Buckingham Park Trailhead	20-Sep-14
Buckingham Park Trailhead	20-Sep-14
Buckingham Park Trailhead	25-Sep-14
Buckingham Park Trailhead	7-Nov-14
Buckingham Park Trailhead	16-Nov-14
Buckingham Park Trailhead	17-Nov-14
Buckingham Park Trailhead	19-Nov-14
Wonderland Lake Trailhead	6-Sep-14
Wonderland Lake Trailhead	6-Sep-14
Wonderland Lake Trailhead	23-Sep-14
Wonderland Lake Trailhead	26-Oct-14
Wonderland Lake Trailhead	10-Nov-14
Wonderland Lake Trailhead	20-Nov-14
Wonderland Lake Trailhead	25-Nov-14

<b>Location</b>	<b>Date</b>
Wonderland Lake Trailhead	25-Nov-14
Wonderland Lake Trailhead	28-Nov-14
Foothills @ Second and Denver	14-Sep-14
Foothills @ Second and Denver	6-Oct-14
Foothills @ Second and Denver	18-Oct-14
Foothills @ Second and Denver	23-Oct-14
Foothills @ Second and Denver	26-Oct-14
Foothills @ Second and Denver	10-Nov-14
Foothills @ Second and Denver	10-Nov-14
Foothills @ Second and Denver	17-Nov-14
Foothills @ Second and Denver	24-Nov-14
Lefthand Trail @ Pebble Beach Lane	3-Sep-14
Lefthand Trail @ Pebble Beach Lane	15-Sep-14
Lefthand Trail @ Pebble Beach Lane	23-Sep-14
Lefthand Trail @ Pebble Beach Lane	13-Oct-14
Lefthand Trail @ Pebble Beach Lane	30-Oct-14
Lefthand Trail @ Pebble Beach Lane	1-Nov-14
Lefthand Trail @ Pebble Beach Lane	21-Nov-14
Lefthand Trail @ Pebble Beach Lane	22-Nov-14
Lefthand Trail @ Pebble Beach Lane	30-Nov-14
Foothills access to Eagle	20-Sep-14
Foothills access to Eagle	3-Oct-14
Foothills access to Eagle	4-Oct-14
Foothills access to Eagle	13-Oct-14
Foothills access to Eagle	23-Oct-14
Foothills access to Eagle	26-Oct-14
Foothills access to Eagle	30-Oct-14
Foothills access to Eagle	6-Nov-14
Foothills access to Eagle	7-Nov-14
Foothills @ Second and Dakota	14-Sep-14
Foothills @ Second and Dakota	14-Sep-14
Foothills @ Second and Dakota	23-Sep-14
Foothills @ Second and Dakota	25-Sep-14
Foothills @ Second and Dakota	26-Sep-14
Foothills @ Second and Dakota	3-Oct-14
Foothills @ Second and Dakota	1-Nov-14
Foothills @ Second and Dakota	19-Nov-14
Foothills @ Second and Dakota	28-Nov-14



## **Appendix C. Location descriptions**

### **SAMPLING SITE NARRATIVES**

#### **Site 1. Wonderland Lake at Poplar Ave. = near 355 Poplar Ave.**

Drive to the intersection of Broadway and Poplar Ave. Head west a little over a half mile (before western end of Poplar Ave.) and park on the street. You should be close to a tennis court/swimming pool area. Walk north/northwest on the trail until you just pass the OSMP regulation board on the Wonderland Lake Trail on the Southwest corner of the lake. This is your spot. There are many places along the trail to observe people passing the trailhead sign. There is not much shade; take a chair if you have one. There is no public restroom. This location has heavy use in the morning and evening especially – you will need 10+ datasheets. Remember to record people passing by on the parallel undesignated trail (slightly uphill from designated trail). **This location has no adjacent parking area to observe; this site will have NO parking data collected.**

#### **Site 2. Fourmile Trailhead = 420 Lee Hill Rd.**

Drive to the intersection of Broadway and Lee Hill Drive. Head west a little more than a third of a mile and park in the Fourmile Trailhead area. Walk south on Foothills South Trail until you get past the trail junctions. This is your spot. You could also conduct the count observations from the parking lot in your car in the shadow of a big tree depending on the time of day OR from the trail down toward the creek and looking back at the trailhead entrance. This location has steady visitation and you will need 6+ datasheets. If the parking lot is full, park on an adjacent public street. Remember to record people passing by on any adjacent undesignated trails. There is no public restroom.

#### **Site 3. BVR (Sage) Trailhead = 3900 Longhorn Rd.**

Drive north out of Boulder on North Foothills Highway (also known as Highway 36) for about one mile from the intersection of Broadway/28<sup>th</sup> street (stoplight here). You should be at the intersection of North Foothills Highway and Longhorn Road and there is a brown Boulder Valley Ranch Open Space sign on the highway here. Head east on Longhorn Road for about one mile until you reach the Boulder Valley Ranch (Sage) Trailhead area. Your spot to observe is just past the pedestrian gate. You could do the observation counts from a vehicle in the parking lot area. This location has a public restroom in the parking lot. This area receives moderate visitation and you will need 4+ datasheets. Remember to record people passing by on the adjacent undesignated trails.

#### **Site 4. Eagle Parking Coffee = 5601 N. Broadway, adjacent to Silver Canyon Coffee**

Drive north out of Boulder on North Foothills Highway (also known as Highway 36) for about 750 feet from the intersection of Broadway/28<sup>th</sup> Street (stoplight here). You should be at the intersection of North Foothills Highway and North Broadway (gravel road on east side). Head east/north on North Broadway for about three fourths of one mile until you reach the parking area adjacent to Silver Canyon Coffee. Your spot to observe is about 150 feet past the pedestrian gate. Remember to record people passing by on the adjacent undesignated trails. This area has a well-defined parking area adjacent to the gate access; record the cars parking here. This location has no public restroom. This area receives moderate visitation and you will need 3+ datasheets.

#### **Site 5. Eagle Trailhead = 5797 51st St.**

Drive toward Boulder Reservoir on 51<sup>st</sup> street (begins on south end at intersection with Jay Road). Continue north/east past Boulder Reservoir entrance about four fifths of one mile until you reach Eagle Trailhead on the west side of 51<sup>st</sup> street. Your spot to observe is about 75 feet past the pedestrian gate. You could do the observation counts from the parking lot looking out through the gate. This location does not have a public restroom. This area receives moderate visitation

and you will need 3+ datasheets. Remember to record people passing by on the adjacent undesignated trails.

**Site 6. Foothills Trailhead = 5273 North Broadway**

Drive north out of Boulder on North Foothills Highway (also known as Highway 36) for about 750 feet from the intersection of Broadway/28<sup>th</sup> Street (stoplight here). You should be at the intersection of North Foothills Highway and North Broadway (gravel road on east side). Head east/north on North Broadway for about one quarter of one mile until you reach the Foothills Trailhead area. Your spot to observe is just past the access point near the regulation board. You could do the observation counts from a vehicle in the parking lot. This location has no shade and no public restroom. This area has low visitation and you will need 2+ datasheets. Remember to record people passing by on the adjacent undesignated trails.

**Site 7. Lefthand Trailhead = 3850 Neva Rd.**

Drive north out of Boulder on North Foothills Highway (also known as Highway 36) for almost three miles from the intersection of Broadway/28<sup>th</sup> Street (stoplight here). You should be at the intersection of North Foothills Highway and Neva Road (paved road on east side). Head east on Neva Road for about one mile until you reach the Lefthand Trailhead area. Your spot to observe is about 75 feet in, just past the regulation board. You could conduct the observation counts from the parking lot. This location has no shade and no public restroom. This area receives moderate visitation and you will need 4+ datasheets. Remember to record people passing by on any adjacent undesignated trails.

**Site 8. Buckingham Park Trailhead = 2500 Lefthand Canyon Dr.**

Drive to the intersection of Broadway and Lee Hill Drive. Head west on Lee Hill Drive a little more than 1.25 miles to the intersection of Lee Hill Drive and Olde Stage Road. Continue north on Olde Stage Road a little more than three miles until you reach the intersection with Lefthand Canyon Drive. Continue north on Lefthand Canyon Drive for about 200 feet until you reach the Buckingham Park Trailhead area. At this location, record anyone who passes by through any of the 3 trail access points – EXCEPT those that only enter to use the restroom and leave. The trails here were severely affected by the September 2013 flood and may not look like what is depicted within the site map. You could conduct the count observations from the parking lot. This location has a public restroom and on-site picnic areas.

**Site 9. Wonderland Lake Trailhead = 4201 N. Broadway**

Head north on Broadway until you reach the intersection with Sumac Ave.. The Wonderland Lake Trailhead area is located here on the west side of Broadway. Sumac Ave. is approximately one mile north of Iris Ave.. Your spot to observe is a little over 100 feet in from the parking lot. This location has some shade and no public restroom. The parking lot is used by the Junior Rangers during the summer months. This area receives heavy visitation and you will need 10+ datasheets. Remember to record people passing by on any adjacent undesignated trails.

**Site 10. Foothills @ Second and Denver = intersection of these 2 streets**

Drive to the intersection of Broadway and Lee Hill Drive. Head west a little more than a third of a mile and turn north onto 5<sup>th</sup> street. Continue north on 5<sup>th</sup> street until you reach the end/intersection with Denver street. Park anywhere along Denver Street near the access point. Your spot to observe is just past the access point. You can observe from a vehicle along the road. This location has no shade and no public restroom. This area receives moderate visitation and you will need 3+ datasheets. Remember to record people passing by on any adjacent undesignated trails. **In the parking lot data, record the number of cars you see parking along Denver/Second streets whose occupants access OSMP.**

### **Site 11. Lefthand Trail @ Pebble Beach Lane (Drive)**

This site can be accessed in two ways. **This location has no adjacent parking area to observe; this site will have NO parking data collected.**

#### **Option one:**

Drive north out of Boulder on North Foothills Highway (also known as Highway 36) for about one mile from the intersection of Broadway/28<sup>th</sup> Street (stoplight here). You should be at the intersection of North Foothills Highway and Longhorn Road and there is a brown Boulder Valley Ranch Open Space sign on the highway here. Head east on Longhorn Road for about one mile until you reach the Boulder Valley Ranch (Sage) Trailhead area. Head west/north on Lefthand Trail for about a half mile. You will reach an intersection with an undesignated trail that leads east to a residential area/Pebble Beach Drive. Your spot to observe is on this undesignated trail, not on Lefthand Trail. Choose this option if you do not want to park/access through a residential neighborhood.

#### **Option two:**

Drive north out of Boulder on North Foothills Highway (also known as Highway 36) for almost three miles from the intersection of Broadway/28<sup>th</sup> Street (stoplight here). You should be at the intersection of North Foothills Highway and Neva Road (paved road on east side). Head east on Neva Road for about one and a third miles until you reach Fairways Drive. Turn south on Fairways Drive and follow this for about one third of a mile. Turn east on Lake Valley Drive. Follow Lake Valley Drive for about a third of a mile until you reach Golf Club Drive (may be shown as Clubhouse Road). Head south on Golf Club Drive for about a half of a mile and this road will start to curve around to the west. At this point the road turns into Pebble Beach Drive. Follow Pebble Beach Drive for about a half mile until you reach the end (turn-around). Find a place to park and find the house with the number 3964 Pebble Beach Drive – the trail to observe runs in between this house and the adjacent house. The access point is not marked and the trail looks faint/low visitation dirt trail. The trail heads west behind the houses and eventually reaches a gate with a small OSMP label.

Go through that gate, and the trail to observe runs another 100 feet to an intersection with Lefthand Trail (runs north/south). Your spot to observe is on this undesignated trail, not on Lefthand Trail. This location has no public restroom and no shade. The driving time from Fairways Drive to Pebble Beach through the neighborhood and past the Golf course takes about 10 minutes. There is a nice restroom/water fountain at a park you will pass.

### **Site 12. Foothills access to Eagle = past the official Foothills Trailhead, and across from the cement plant. This location is also known as the Degge trail parking access point.**

Drive north out of Boulder on North Foothills Highway (also known as Highway 36) for about 750 feet from the intersection of Broadway/28<sup>th</sup> Street (stoplight here). You should be at the intersection of North Foothills Highway and North Broadway (gravel road on east side). Head east/north on North Broadway for less than one half of a mile (pass the Foothills Trailhead area) until you reach an informal parking area near the pedestrian gate. Your spot to observe is just past the gate/before the trail splits into the Eagle and Degge Trails. You could do the observation counts from a vehicle in the parking area along the fenceline. This location has no shade and no public restroom. This area has low visitation and you will need 3+ datasheets. This area has a fair amount of visitation during the early morning shifts. Remember to record people passing by on any adjacent undesignated trails.

### **13. Foothills @ Second and Dakota = intersection of Second Street and Dakota Boulevard**

Drive to the intersection of Broadway and Lee Hill Drive. Head west a little more than a third of a mile and turn north onto 5<sup>th</sup> street. Continue north on 5<sup>th</sup> street until you reach Dakota Boulevard (less than 1,000 feet). Head west on Dakota Boulevard for about 800 feet until you

reach a neighborhood parking area. Park here or anywhere along Second Street or Dakota Boulevard near the access point. Your spot to observe is just past the access point and before the intersection with Foothills North Trail. You could observe from a vehicle along the road. This location has no shade and no public restroom. This area receives moderate visitation and you will need 4+ datasheets. Remember to record people passing by on any adjacent undesignated trails. **In the parking lot data, record the number of cars you see parking within the marked spots and along Dakota Boulevard/Second streets whose occupants access OSMP.**

## **Appendix D. NTSA Volunteer manual guidelines**

### **WELCOME TO THE OPEN SPACE AND MOUNTAIN PARKS NORTH TRAIL STUDY AREA VISITATION MONITOR PROGRAM**

OSMP's volunteer visitation monitors collect data at recreation access points used by visitors to OSMP. This data will be used to help determine the current level and distribution of recreation activities in the northern tier of OSMP. Visitation monitors provide valuable data to the department, and collected information will be very important as OSMP begins the North Trail Study Area (NTSA) planning efforts.

The data provided by OSMP visitation monitors will help resource managers understand how visitors are accessing this area, a critical piece of baseline information for the upcoming planning effort. The data provided by visitation monitors will quantify the number of recreation visits and also how the parking lots are being used. This information will help OSMP managers and other staff during the decision making phases of the North Trail Study Area (NTSA) planning process. Without the eyes and ears of visitation monitors, the NTSA recreation inventory would need to be conducted with 10-year old visitation data – something not preferable during the planning effort.

### **OSMP VISITATION BACKGROUND**

The Open Space and Mountain Parks Department (OSMP) last conducted a visitation study along designated access points in the NTSA during 2004-2005 (Vaske & Donnelly, 2008; Vaske, Shelby, & Donnelly, 2009). This area includes numerous designated trailheads and access points along with many undesignated trails. As part of the preparation phase for conducting the NTSA Recreation Inventory, OSMP seeks an update to the understanding of visitation to this planning area.

Standard types of data to include in visitation studies, including this project, are:

- Visitor party demographics
- Activity participation
- Visitation levels
- Parking lot capacity

### **MATERIALS**

Make sure you have everything BEFORE you head out!

What To Bring:

- Data collection sheets (example in Attachment A) and clipboard
- Pen or pencil
- A watch or cell phone for noting time
- Site map(s) and driving directions to access point
- Foam pad or collapsible chair
- Insect repellent / sunscreen
- Sunhat
- Manual if you'd like a reference
- Personal food/water
- Something to identify you as OSMP should someone ask

- Jennelle and Deonne’s phone numbers for questions
  - Jennelle: 303-413-7656 (desk) or 303-818-6972 (cell)
  - Deonne: 720-564-2082 (desk) or 303-906-4092 (cell)

### **GENERAL METHODS and PROTOCOLS**

Direct observation methods will be used to determine observable visitor party demographics, activity distributions and visitation distributions across all days of the week.

#### **General NTSA Observation Protocols**

1. Prior to departure from home, make sure you have an adequate number of observation datasheets for each shift to be covered that day (one shift is defined as a 2-hour period at one site). Volunteers will generally have two shifts per sign-up day. Check the schedule to determine your places to go for your shift(s). Be sure to have your map of the area and know how to get to your observation point.
2. Observer should arrive to the area 5 minutes before the hour of the first shift.
3. Position yourself in an unobtrusive location at the area trailhead or parking lot so as to not interfere with visitor activity.
4. Please write legibly.
5. You will record observations (counts) for every visitor party that passes the sample point including all directions of travel. A visitor party is any recreation group that in the best judgment of the observer is intentionally travelling together.
6. Count all people in the visitor party including babies/small children in backpacks or strollers.
7. For the time – record on the half hour for a total of 5 times (example: 7:00, 7:30, 8:00, 8:30 and 9:00 for 7-9 a.m. shift.).
8. For the Parking lot data, record on the half hour on the right hand part of the datasheet; record parking lot data a total of 4 times; (example: for the 4-6 p.m. shift record parking lot data at 4:00, 4:30, 5:00 and 5:30; 6:00 would not be counted to give you time to travel to the next location.
9. A large occupancy vehicle is defined as a vehicle intended for multi-passenger use such as a school bus or a 15-passenger van; does not include large standard vehicles such as a big pickup or SUV.
10. After completion of your final count at the end of the 2-hour shift, travel as quickly as possible to the next site for your next 2-hour shift.
11. On the datasheet, be sure to indicate the site observed, times, date, and complete the information indicated. If you choose to take photographs, please label the location and time for each photo and provide these to OSMP on a monthly basis.
12. At the end of each shift(s), double check all of your entries.
13. For each shift, please take your datasheets and staple or paper clip together.
14. Have fun and smile – we appreciate you.
15. Return your datasheets at least monthly to OSMP in care of Deonne Vander Woude or Jennelle Freeston. You will need to return them to the OSMP administrative offices at 66 S. Cherryvale Rd., Boulder CO 80303. **Please do not return them to any other OSMP location, thank you.**
16. In case of an emergency – contact:

Deonne VanderWoude

City of Boulder Open Space and  
Mountain Parks  
66 S. Cherryvale Rd., Boulder CO  
80303  
720-564-2082 or 303-906-4092  
[vanderwoude@bouldercolorado.gov](mailto:vanderwoude@bouldercolorado.gov)

Stuart Cottrell, PhD

Cottrell & Associates Environmental Consulting  
1613 Peterson Place  
Fort Collins, CO 80525  
[Stuart.cottrell@colostate.edu](mailto:Stuart.cottrell@colostate.edu)  
970-481-0014 or 970-491-7074

### **Additional reminders**

- The sample point represents a virtual line that visitors are crossing. In the area of the red star on your map, there may be more than one trail (such as a designated trail and a parallel undesignated trail) and you should observe people on all trails crossing the virtual line
- Don't count people twice if they return to the access point right away and then go back to recreating on OSMP (e.g. to place a dog poop bag in a trash can or because they forgot something in the car)
- Do count people twice if they come through more than once during your 2-hour period during the normal course of their travels (example: doing a loop trail)
- Don't count people if they only came to OSMP to use the restroom
- If you use activity code "other", define what the visitor party is doing in the visitor party notes section
- Attempt to not interact with visitors as this could cause you to lose observations
- If nature calls and you are gone for more than 5 minutes, please record this on your datasheet in the notes section at the bottom of your form
- Feel free to note any wildlife observations within the "notes" section at the bottom of the datasheet

### Appendix E. Overall summer and fall season visitor notes from observer datasheets

The following tables provide a frequency overview of the visitor notes overall for the summer season in the left-hand column and for the fall in the right-hand column. The columns were sorted to present the most frequent responses at the top of the table for a comparison between the summer and fall season observer comments.

Summer Overall Comments	Frequency	%	Fall Overall Comments	Frequency	%
Car in lot	34	17%	Passing through either running, biking, or hiking	262	40%
Leave trail	12	6%	Car in lot	199	30%
Car park in lot	11	5%	Toilet	6	
Counted twice	10	5%	Used undesignated trail.	6	
Going through on trails - did not use access trail	6	3%	Baby	4	
Park car in lot	5	2%	Truck in lot	4	
Toilet use	5	2%	Use outhouse	4	
Took side trail	3	1%	2 cars in lot	3	
Arrival	2		Car	3	
Car arriving	2		Drop off trash	3	
Car in lot	2		From neighborhood	3	
Car only	2		Picnicking	3	
Fishers	2		Through - use outhouse	3	
On cell phone	2		Through	3	
Park car in lot	2		Use toilets	3	
Parked in lot	2		Used access gate	3	
Unknown	2		Used the outhouse	3	
Used outhouse	2		Workers using outhouse	3	
1 adult 2 children	1		Baby in stroller	2	
1 child biker	1		Came from side trail	2	
1 female and 7 youth	1		Car park outside	2	
1 male, 2 females	1		Carriage	2	
2 cars in lot	1		Sitting in vehicle	2	



<b>Summer Overall Comments</b>	<b>Frequency</b>	<b>%</b>	<b>Fall Overall Comments</b>	<b>Frequency</b>	<b>%</b>
2 couples - seniors	1		Through on cobalt	2	
2 guides with 8 kids on bikes	1		Use the outhouse	2	
2 rangers enter building	1		Used trash can	2	
2nd time around lake	1		Walk dog	2	
4 OS in truck	1		Went into neighborhood	2	
All males	1		car in lot	1	
Arrived in car	1		18 people walking passed not using access point	1	
Baby in carriage	1		2 cars arrive - 2 people and hiked other trail out of lot	1	
Baby in stroller	1		2 cars left	1	
Began heavy rain and hailing heavily	1		2 cars pull in and pull out	1	
Bike arrive - went other trail	1		2 cars pull in together	1	
Bike on road (not in area)	1		2 guys walking 4 dogs in neighborhood - came to get doggy bags	1	
Came from side trail down mtn.	1		2 kids on bikes	1	
Came from side trail from mtn	1		3 babies in strollers	1	
Came in and left in 2 minutes	1		3 kids	1	
Came in car	1		All kids	1	
Came in from road	1		Babies in stroller	1	
Came out side trail	1		Babies in stroller	1	
Came to gate and turned around	1		Baby in front pack	1	
Car arrive to lot	1		Backpacking walking through	1	
Car arrive to park - people did not go in - went other trail	1		Came back to pick up jacket on the trail	1	
Car came to meet someone	1		Came down undesignated uphill trail to west	1	
Car in lot (5 people)	1		Came from other trail	1	
Car parked for 5 minutes then left	1		Came from road	1	
Car turned around and left	1		Came to get doggy bag	1	
Cars arrive - meeting each other and getting in one car and leaving	1		Came up to sign to get doggy bag - did not go in the area	1	
Cars in lot	1		Camera / smoking	1	
Cars parked in lot	1		Car - on phone	1	

<b>Summer Overall Comments</b>	<b>Frequency</b>	<b>%</b>	<b>Fall Overall Comments</b>	<b>Frequency</b>	<b>%</b>
Dad running with kids	1		Car - worker using outhouse	1	
Did not leash dog in parking lot	1		Car arrive	1	
Dismounted and walked in	1		Car arrive - park outside of lot	1	
Dog encountered snake on trail	1		Car arrive to drop off someone to pick up their car	1	
Dog rolled in cow poop	1		Car came and left	1	
Drove in a left	1		Car depart	1	
Entering	1		Car in lot	1	
Exiting	1		Car in lot - but came from the road	1	
Family of 3	1		Car in lot - depart	1	
Family of 4	1		Car in lot - hike to river	1	
Female biked to gate from inside and turned around	1		Car in lot - loaded bike in van	1	
Female with kid in cart	1		Car in lot - looked at sign	1	
Female with baby	1		Car in lot - parked to drop off trash only	1	
Four adults and 4 children about 10 years old	1		Car in lot - sat in the car	1	
Garbage pick up	1		Car in lot - stayed in car	1	
Girl about 13 yrs	1		Car in lot - use outhouse	1	
Girl dancing	1		Car in lot - went out on road	1	
Girl, 13 years old about	1		Car in lot - with stroller	1	
Got off the trail	1		Car in lot - young people hanging out	1	
Heavy rain	1		Car in lot take other trail	1	
Held dog collar in lot	1		Car left	1	
Hiker returned to car, said dog wouldn't go for hike	1		Car park in lot	1	
I saw a deer	1		Car park outside lot	1	
Large family	1		Car parked outside	1	
Little kid on bike	1		Car pulled up	1	
Male	1		Car use lot only	1	
Male with British Accent	1		Car waiting / car arrive - headed out other direction	1	
Man from pickup got out to walk dog	1		City of Boulder	1	
Missing activity	1		Collected a sample of something and then left at 10:37	1	

<b>Summer Overall Comments</b>	<b>Frequency</b>	<b>%</b>	<b>Fall Overall Comments</b>	<b>Frequency</b>	<b>%</b>
Mother and two kids	1		Couple biking with trailer	1	
Not leashed in parking lot	1		Depart in truck	1	
Observer unsure if 25 and 26 are one party	1		Dog went off-trail - may be chasing prairie dogs	1	
Older couple, female in electric wheel chair	1		Double amputee made it to access point and turned back	1	
On phone	1		Drove in to take pictures then left	1	
One adult and one baby	1		Family biking	1	
OSMP employee in truck	1		Family running together	1	
OSMP vehicles picking up trash	1		Family w/3 cars	1	
Parked hiked out	1		Fire rescue people	1	
Picked up bike locked on access gate	1		From side trail	1	
Picnickers	1		Get trash	1	
Racewalking	1		Go to the river	1	
Ranger on duty	1		Group photography	1	
Speed walker	1		Had fishing gear & buckets	1	
Started raining	1		Had fishing poles	1	
Stroller	1		Hike through	1	
Took side trail up	1		Hike to the river	1	
Tractor	1		Horse trailer in lot	1	
Truck	1		Into neighborhood	1	
Truck in lot	1		Jeep in lot	1	
Truck/trailer	1		Just used trash can	1	
Two children about 10 years old	1		Left after 20 minutes	1	
Use parking lot only	1		Left by car	1	
Used bathrooms	1		Left in 2 cars	1	
Used restroom and left	1		Left in vehicle	1	
Used restroom and left	1		Maintenace trash	1	
Van - - not in area for the areas	1		Messed with sewer drain handle.	1	
Visitor introduced himself and said he was chairman of OSMP; said thanks for volunteering	1		Met on trail with other couple	1	

<b>Summer Overall Comments</b>	<b>Frequency</b>	<b>%</b>	<b>Fall Overall Comments</b>	<b>Frequency</b>	<b>%</b>
Walk to river	1		No one seen	1	
Walked to river	1		Os to work on gates	1	
Went to gate and returned to car because of hail	1		Park and snack in car	1	
With baby	1		Parked	1	
With baby in stroller	1		People picnicking	1	
Women and kids on bikes and with stroller	1		Pick up biker	1	
Total	202		Running through - did not pass it	1	
			Sat in car	1	
			Sat in car for awhile	1	
			Sightseeing	1	
			Sit in car	1	
			Skydiver	1	
			Sneaky Dog	1	
			Snow showing	1	
			Social trail	1	
			Social trail along ditch then uphill	1	
			Stay in lot	1	
			Stayed 3 minutes	1	
			Stayed in lot 10 minutes	1	
			Stopped to urinate	1	
			Through - woman with 3 kids	1	
			Through with baby	1	
			Took a picture from car	1	
			Truck drove through parking lot	1	
			Truck just pulled through lot	1	
			Turned around	1	
			Turned around running	1	
			Two kids	1	
			Use outhouse and walk around	1	

<b>Summer Overall Comments</b>	<b>Frequency</b>	<b>%</b>	<b>Fall Overall Comments</b>	<b>Frequency</b>	<b>%</b>
			Used social trail going uphill	1	
			Used the trail to the west going downhill	1	
			Used undesignated trail along ditch	1	
			Used uphill trail to west coming down	1	
			Van in lot - went out on road	1	
			W/baby	1	
			Walk dog to poop	1	
			Walked in and then back out	1	
			Went off side trail	1	
			Went to another car	1	
			Went uphill to west	1	
			Went west uphill on social trail	1	
			Woman dropped off to pick up her car	1	
			Total	660	

**Appendix F. Sample coverage sheet – June, July and August**

Sampling Site Names and Numbers		NTSA Visitation Study Coverage - Summer Season (June/July/August) 2014								
Sample Site Name	Site Number	Weekday a.m.	Weekday a.m.	Weekday mid-day	Weekday mid-day	Weekday p.m.	Weekday p.m.	Weekend a.m.	Weekend mid-day	Weekend p.m.
Wonderland Lake Trail @ Poplar Ave.	1	6/19-V	7/18-U	6/24-V	7/25-C	6/2-C	8/21-C	6/1-C	6/29-V	7/20-U
Fourmile Trailhead	2	8/12-C	7/25-C	7/1-U	7/18-U	6/2-C	8/21-C	6/1-C	6/1-C	6/1-C
BVR (Sage) Trailhead	3	6/4-C	7/1-U	6/2-C	8/27-C	7/18-U	8/2-U	7/12-C	7/20-U	6/7-C
Eagle Parking Coffee	4	6/4-C	7/7-V	7/1-U	8/27-C	7/18-U	8/2-U	7/20-U	6/7-C	7/26-U
Eagle Trailhead	5	7/23-U	6/13-C	8/12-C	8/21-C	7/1-U	8/6-U	7/5-V	6/14-V	6/1-C
Foothills Trailhead	6	6/2-C	7/2-U	6/17-V	7/23-U	6/24-V	8/6-U	6/29-V	6/1-C	7/13-C
Lefthand Trailhead	7	6/24-V	8/6-U	8/21-C	7/2-C	7/23-U	8/18-U	7/26-U	6/14-V	7/12-U
Buckingham Park	8	7/2-U	6/13-C	6/4-C	8/12-C	7/23-U	8/27-C	7/13-C	7/12-U	6/7-C
Wonderland Lake Trailhead	9	8/27-C	8/21-C	6/4-C	6/17-V	7/2-U	8/18-U	6/8-V	6/8-V	7/12-C
Foothills @ 2nd & Denver	10	6/24-V	7/7-V	6/24-V	7/7-U	8/21-C	8/27-C	6/8-V	6/8-V	8/2-C
Lefthand Trail @ Pebble Beach Lane	11	6/2-C	8/21-C	6/2-C	6/13-C	7/7-U	7/25-U	6/15-V	6/15-V	8/2-C
Foothills access to Eagle	12	8/6-U	8/1-U	7/25-U	6/13-C	6/24-V	7/7-U	6/15-V	6/15-V	8/24-C
Foothills @ 2nd & Dakota	13	6/20-V	7/23-V	6/20-V	7/2-C	6/12-V	8/12-C	6/29-V	6/29-V	7/13-C
U=Unassigned as of 6/3/14										
C=CAEC										
V=Volunteer										

Developed by Deonne VanderWoude

**Appendix G1. Comprehensive (all sampling periods) summer parking distribution per site**

Fourmile Trailhead		BVR (Sage) Trailhead		Eagle Parking Coffee		Eagle Trailhead		Foothills Trailhead		Left-hand Trailhead		Buckingham Park		Wonderland Lake Trailhead		Foothills @ Second and Denver		Foothills access to Eagle		Foothills @ Second and Dakota	
Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars
700	3	930	22	700	4	930	31	700	3	700	4	700	0	700	1	930	2	930	6	700	0
730	6	1000	20	730	0	1000	32	730	2	730	9	730	0	730	0	1000	0	1000	5	730	0
800	6	1030	18	800	1	1030	16	800	4	800	14	800	0	800	5	1030	1	1030	2	800	0
830	8	1100	15	830	0	1100	16	830	7	830	13	830	0	830	3	1100	1	1100	2	830	1
930	11	1130	15	930	4	1130	8	930	7	1130	8	930	4	930	14	1130	1	1400	4	930	1
1000	13	1200	8	1000	4	1200	9	1000	6	1200	8	1000	3	1000	9	1200	1	1430	3	1000	3
1030	18	1230	9	1030	2	1230	8	1030	5	1230	6	1030	6	1030	10	1230	0	1500	4	1030	2
1100	13	1300	8	1100	2	1300	6	1100	3	1300	4	1100	4	1100	14	1300	0	1530	2	1100	2
1130	34	1430	5	1130	0	1400	2	1400	5	1400	3	1400	10	1130	32	1400	0	1600	4	1130	4
1200	20	1600	6	1200	0	1430	3	1430	4	1430	2	1430	10	1200	29	1430	0	1630	3	1200	3
1230	40	1630	1	1230	0	1500	3	1500	5	1500	2	1500	9	1230	30	1500	0	1700	3	1230	2
1300	42	1700	5	1300	0	1530	3	1530	9	1530	3	1530	9	1300	26	1530	0	1730	2	1300	1
1330	20	1730	5	1400	0	1600	7	1600	1	1600	3	1600	2	1400	1	1600	0	1830	2	1400	1
1400	4	1830	6	1430	2	1630	11	1630	2	1630	2	1630	4	1430	3	1630	0	1900	0	1430	0
1430	6	1900	6	1500	3	1700	11	1700	3	1700	1	1700	4	1500	4	1700	1	1930	2	1500	0
1500	4	1930	3	1530	4	1730	11	1730	1	1730	1	1730	5	1530	6	1730	0	2000	2	1530	0
1530	7	2000	0	1600	1	1830	5	1830	6	Total	83	1830	3	1600	7	1800	0	Total	46	1600	1
1600	29	Total	152	1630	1	1900	3	1900	4			1900	5	1630	11	1830	0			1630	1
1630	29			1700	4	1930	7	1930	1			1930	4	1700	12	1900	2			1700	1
1700	25			1730	5	2000	5	2000	4			2000	2	1730	12	1930	2			1730	3
1730	21			1830	0	Total	197	Total	82			Total	84	1800	11	2000	2			1830	3
Total	359			1900	0									1830	20	Total	13			1900	2
				1930	2									1900	17					1930	3
				2000	3									1930	20					2000	3
				Total	42									Total	297					Total	37

## Appendix G2. Comprehensive (all sampling periods) fall parking distribution per site

Fourmile Trailhead		BVR (Sage) Trailhead		Eagle Parking Coffee		Eagle Trailhead		Foothills Trailhead		Left-hand Trailhead		Buckingham Park		Wonderland Lake Trailhead		Foothills @ Second and Denver		Foothills access to Eagle		Foothills @ Second and Dakota		
Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	Time	# of cars	
700	2	930	15	700	3	700	4	700	8	930	7	700	0	700	2	730	2	700	0	700	0	
730	5	1000	18	730	1	730	8	730	9	1000	3	730	0	730	5	800	0	730	1	730	0	
800	4	1030	16	800	2	800	10	800	8	1030	6	800	0	800	7	830	0	800	0	800	0	
830	4	1100	23	830	5	830	18	830	0	1100	7	830	0	830	5	900	0	830	2	830	1	
900	2	1130	2	900	2	1200	17	930	5	1430	6	930	3	930	9	930	0	1000	11	900	2	
1000	2	1430	24	930	2	1230	11	1000	11	1500	9	1000	1	1000	8	1000	0	1030	12	930	0	
1030	5	1500	43	1000	2	1300	20	1030	8	1530	11	1030	2	1030	7	1030	0	1100	6	1000	1	
1100	8	1530	41	1030	3	1330	22	1100	7	1600	15	1100	3	1100	8	1100	1	1130	4	1030	1	
1130	5	1600	33	1100	2	1430	2	1130	4	1630	2	1200	4	1200	11	1200	1	1200	8	1100	0	
1200	21	1630	12	1130	0	1500	3	1200	8	Total	66	1230	3	1230	5	1230	1	1230	12	1200	0	
1230	20	1700	1	1200	4	1530	4	1230	9			1300	3	1300	6	1300	0	1300	12	1230	0	
1300	16	1730	5	1230	1	1600	7	1300	5			1330	3	1330	9	1330	0	1330	9	1300	1	
1330	15	1800	6	1300	2	1630	17	1330	5			1500	2	1430	16	1430	1	1500	2	1330	1	
1430	6	Total	239	1330	6	1700	16	1430	7			1530	4	1500	37	1500	1	1530	3	1430	1	
1500	18			1430	0	1730	19	1500	25			1600	3	1530	34	1530	0	1600	5	1500	1	
1530	21			1500	0	1800	11	1530	24			1630	2	1600	28	1600	0	1630	12	1530	1	
1600	14			1530	0	Total	189	1600	21			1700	8	1630	18	1630	0	1700	11	1600	3	
1630	12			1600	2			1630	22			1730	5	Total	215	1700	0	1730	7	1630	1	
1700	18			1630	2			1700	11			1800	2			1730	0	1800	5	1700	2	
1730	14			1700	2			1730	11			1830	1			1800	0	Total	122	1730	1	
1800	8			1730	5			1800	12			Total	49			Total	7			1800	1	
1830	5			1800	4			1830	8											1830	0	
Total	225			1830	4			Total	228											Total	18	
				Total	54																	



## Appendix H. Comprehensive counts by variable per summer and fall seasons per site

### Comprehensive summer counts per site attribute

Site	# People	# Hikers	# Cyclists	# Runners	# Equestrians	# OS	# Other	# Dogs on leash	# Dogs off leash	# Vehicles	# Horse Trailers	# High volume vehicles	Parking Lot exceeded
Wonderland Lake Trail @ Poplar Ave.	1,096	599	129	368	0	0	0	154	8	0	0	0	No
Fourmile Trailhead	622	281	139	190	0	1	11	53	5	405	0	3	No
BVR (Sage) Trailhead	346	178	71	82	12	2	1	56	52	151	0	0	No
Eagle Parking Coffee	220	70	86	63	0	1	0	26	40	48	0	0	No
Eagle Trailhead	316	143	113	52	4	0	4	28	23	197	3	0	No
Foothills Trailhead	160	57	49	41	0	12	1	8	7	81	0	0	No
Left-hand Trailhead	85	32	29	15	7	1	1	9	4	79	7	0	No
Buckingham Park	160	118	25	0	0	1	16	17	1	79	0	0	No
Wonderland Lake Trailhead	605	376	86	122	0	8	13	84	0	311	0	3	Yes (2)
Foothills @ Second and Denver	105	85	5	13	0	2	0	10	6	13	0	0	No
Left-hand Trail @ Pebble Beach Lane	54	29	17	7	1	0	0	8	0	0	0	0	No
Foothills access to Eagle	111	57	8	44	0	2	0	20	14	46	0	0	No
Foothills @ Second and Dakota	266	140	38	88	0	0	0	36	19	37	0	0	No
<b>GrandTotal</b>	<b>4,146</b>	<b>2,165</b>	<b>795</b>	<b>1,085</b>	<b>24</b>	<b>30</b>	<b>47</b>	<b>509</b>	<b>179</b>	<b>1,447</b>	<b>10</b>	<b>6</b>	<b>2</b>

Comprehensive fall counts per site attribute

Site	# People	# Hikers	# Cyclists	# Runners	# Equestrians	# OS	# Other	# Dogs on leash	# Dogs off leash	# vehicles	# Horse Trailers	# High volume vehicles	Parking Lot exceeded
Wonderland Lake Trail @ Poplar Ave.	1,280	802	174	303	0	0	1	201	8	0	0	0	No
Fourmile Trailhead	818	379	97	304	0	2	36	131	1	225	4	0	No
BVR (Sage) Trailhead	517	324	97	77	2	1	16	109	76	239	0	0	Yes (3)
Eagle Parking Coffee	158	91	37	26	0	1	3	34	62	52	0	0	No
Eagle Trailhead	326	111	117	89	0	4	5	36	48	189	2	0	No
Foothills Trailhead	261	118	53	87	0	1	2	16	19	228	0	0	Yes (2)
Left-hand Trailhead	107	28	51	18	2	3	5	10	0	66	2	0	No
Buckingham Park Trailhead	112	59	7	0	0	1	45	9	0	49	0	0	No
Wonderland Lake Trailhead	735	549	73	106	0	0	7	144	6	215	0	0	Yes (5)
Foothills @ Second and Denver	137	104	9	24	0	0	0	16	20	7	0	0	No
Lefthand Trail @ Pebble Beach Lane	24	20	2	2	0	0	0	9	2	0	0	0	No
Foothills access to Eagle	242	115	15	109	3	0	0	41	71	119	0	0	Yes (2)
Foothills @ Second and Dakota	134	75	5	54	0	0	0	31	13	18	0	0	No
<b>Grand Total</b>	<b>4,851</b>	<b>2,775</b>	<b>737</b>	<b>1,199</b>	<b>7</b>	<b>13</b>	<b>120</b>	<b>787</b>	<b>326</b>	<b>1,407</b>	<b>8</b>	<b>0</b>	<b>12</b>