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SCOPING TRIP REPORT

HOT SPRINGS NATIONAL PARK VISITOR USE COUNTING AND ESTIMATION

3.3.2016



PREPARED FOR:

HOT SPRINGS NATIONAL PARK, US NATIONAL PARK SERVICE

SUBMITTED BY:

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1.0 INTRODUCTION

All units of the National Park Service (NPS) are required to collect and report data on visitor use. This information is archived, analyzed, and made public by the Public Use Statistics Collection and Reporting Program (PUSCRP), housed within the NPS's Social Science Branch (SSB). NPS Units use the public use statistics generated by this program internally for planning and management, and externally for communication with the public and park stakeholders. To be useful for these several purposes, visitor use statistics must accurately reflect the types and amounts of visitation that park units receive.

Hot Springs National Park (HOSP) last revised its public use statistics data collection procedures in 2008. That revision was the latest in a series of minor revisions of a basic methodology whose origin predates the earliest available PUSCRP documentation. Since 2008, a variety of changes have occurred within the park (e.g. building leasing, campground development, etc.) that are not accounted for in the existing visitor use counting and estimation procedures. Moreover, the urban location of HOSP within the City of Hot Springs and the various access points into the park, complicate procedures to estimate visitation. These factors combined suggest that the PUSCRP count procedures for HOSP require refinements to ensure that visitor use is being collected and reported accurately.

RSG has been contracted to provide specific expertise on visitor use counting issues including industry accepted design standards for count systems, sampling approaches to collect representative data, and statistical procedures to analyze these data. The projects' overall goal is to improve data collection methodologies for counting and estimating visitor use at HOSP in order to ensure that visitor use data are collected, analyzed, and reported accurately.

A primary element of this project was an initial scoping site visit to understand the location and issues associated with visitor use counting and estimation in HOSP. This scoping trip report is the product of the scoping site visit.

The scoping trip report reviews the activities associated with planning and executing the scoping site visit, and presents our understanding of HOSP's visitor use, visitor use counting and estimation procedures, and issues associated with counting and estimating visitor use in the park.

2.0 SCOPING TRIP PREPARATION

In preparation for the scoping trip, RSG coordinated a series of conference calls and developed a pre-trip briefing packet. The conference calls introduced NPS SSB and RSG staff to HOSP and the need for this project, and established plans for the scoping trip. The pre-trip briefing packs included an agenda for the meeting, reviewed current visitor use counting and estimation procedures at HOSP, summarized recent visitation statistics, and shared articles describing a visitor use estimation approach used in Acadia National Park. We included the articles on Acadia's visitor use estimation approach to stimulate participants' thoughts and share an alternative methodology that may be applicable to HOSP.

2.1 | Conference Calls

RSG staff coordinated and led two conference calls in preparation for the scoping trip. These calls had several purposes. First, they allowed RSG, NPS SSB, and HOSP staff to review the scope of work and project timeline together. Second, they were a mechanism for planning the scoping trip. Third, they were a forum to begin technical discussion of HOSP counting procedures. Forth, they provided an opportunity for project participants to build rapport prior to the onsite scoping trip.

CONFERENCE CALL 1: AUGUST 27TH, 2015

The first conference call was held on August 27th, 2015 at 11:00am EDT, for approximately one hour.

Participants on this conference call included:

- HOSP Staff
 - Josie Fernandez, Superintendent
 - Tricia Horn, Management Assistant
- NPS SSB Staff
 - David Pettebone, Applied Research Coordinator
 - Pam Ziesler, PUSCRP
- RSG Staff
 - Steve Lawson, Director - Project Manager
 - Nathan Reigner, Consultant

Below is the agenda for the first conference call, with discussion leaders listed in parentheses. Key items of discussion are bulleted below each agenda item.

1. Introductions (RSG)
2. Project background and purpose (HOSP)
 - Estimates of park visits are important for multiple reasons including resource management, administrative planning, public relations, and statutory compliance.

- Major changes have occurred in HOSP since the current visitor use counting and estimation methodology was last revised, including the new leasing of a number of bathhouses and development of the park's campground.
 - The current procedures do not include a number of visitor uses that park staff recognize to be important.
3. Review of project Scope of Work (RSG)
 - RSG staff, and NPS SSB staff if possible, will visit HOSP to become familiar with the park and its counting procedures, and to meet with HOSP staff to gain an understanding of visitor use patterns and park facilities.
 - RSG will draft and present two documents to HOSP. One will be a report on the activities and findings of the scoping trip. The other will present a Visitor Use Study Strategy to revise and improve the procedures used by HOSP to estimate visitor use.
 4. Scheduling for onsite scoping trip (RSG)
 - The group identified late September and early October as potential times for the scoping trip. RSG and HOSP staff are available during these times, they align with the project timeline, and visitor use in HOSP will be active.

CONFERENCE CALL 2: SEPTEMBER 30TH, 2015

The second conference call was held on September 30th, 2015 at 11:00am EDT, for approximately one hour

Participants on this conference call included:

- HOSP Staff
 - Josie Fernandez, Superintendent
 - Tricia Horn, Management Assistant
- NPS SSB Staff
 - Pam Ziesler, PUSCRP
- RSG Staff
 - Steve Lawson, Director - Project Manager
 - Nathan Reigner, Consultant

Below is the agenda for the second conference call, with discussion leaders listed in parentheses. Key items of discussion are bulleted below each agenda item.

1. Review and finalize agenda items for site visit, including HOSP, SSB, and RSG "assignments" (RSG)
 - An agenda for the scoping trip is presented in Appendix A of this report.
 - "Assignments" for leadership of agenda items were made.

- HOSP was asked to lead discussions providing an overview of the park and its use, and near- and mid-term park plans that might influence visitor use estimation.
 - NPS SSB was asked to lead an agenda that reviewed current visitor use estimating procedures.
 - RSG will lead agenda items designed to elicit and synthesize information about needs for visitor use data, challenges with current procedures, sources of visitor use data, and alternatives for future visitor use counting and estimation procedures.
- 2. Review and finalize list of participants for various aspects of the site visit (RSG and HOSP)
 - Park staff specifically invited to join the scoping meeting include the Superintendent and Management Assistant, and representatives from interpretation and visitor services, maintenance, business and revenue management, concessions and commercial use, and law enforcement.
- 3. Meeting logistics including meeting room, audio & visual, transportation to recreation sites, etc. (RSG)
 - Arrangements for meeting room resources including flip charts/white board, computer projector, and coffee were made.
 - Group onsite transportation was arranged so all participants could travel together to facilitate discussion.
 - HOSP Staff provided advice for travel and lodging logistics for RSG and NPS SSB staff.

2.2 | PRE-TRIP BRIEFING PACKET

RSG developed a pre-trip briefing packet to prepare all participants in the project for a productive scoping trip. The briefing packet contained an agenda for the scoping trip, the current procedures for counting visitor use in HOSP, maps depicting key visitor use counting locations within the park, summaries of recent public use statistics, and articles describing a visitor use estimation procedure developed for Acadia National Park that may provide a useful model for approaching visitor use estimation at HOSP. This pre-trip briefing packet appears in Appendix A.

AGENDA

The agenda for the scoping trip outlines two days of activities.

The first day focused on orienting RSG and NPS SSB staff to HOSP and its visitor use and current visitor use counting and estimation procedures. This included a conference room-based session in the morning and a field-based session in the afternoon.

The second day focused on issues or challenges with the current count procedures and alternatives to improve the procedures in the future.

CURRENT VISITOR USE ESTIMATION PROCEDURES

Current visitor use estimation procedures are described in the Hot Springs National Park Public Use Counting and Reporting Procedures posted on the NPS Public Use Statistics Office's website: <https://irma.nps.gov/Stats/Reports/Park/HOSP>. This document, which was included in the pre-trip briefing packet, is produced by PUSCRP. These procedures have been in effect since January 1, 2008.

MAPS DEPICTING CURRENT DATA COLLECTION LOCATION

RSG staff developed two maps to depict the collection locations for data used in the current HOSP visitor use counting procedures. The locations noted in these maps represent the best approximation of the actual locations of data collection that could be made from Hot Springs National Park Public Use Counting and Reporting Procedures.

One of the maps depicts HOSP as a whole. The other map focuses on Bathhouse Row in greater detail. These maps were developed to help project participants visualize the park and its current data collection array.

SUMMARY OF PUBLIC USE STATISTICS

Two summaries of NPS Public Use Statistics were created to help the project team understand the magnitude and patterns of visitor use estimates for HOSP. One summary presents average monthly use for the past five years (2010 – 2014). The other summary presents annual park visitation from roughly 1910 through 2014.

The monthly average visitation summary reveals a seasonal pattern of visitation. Visitation is highest in the summer (June – September) and lowest in the winter (December – February). Average monthly visitation in the summer is approximately 2 – 3 times greater than in the winter. Visitation in the spring and fall is at a level between that of the winter and summer.

Annual visitation estimates vary widely through time. Two patterns within the annual data are of particular note. First, there is a general upward trend in visitation with time. This is typical of national park visitation across the system. Second, there are historical periods when HOSP reported considerably higher visitation than in the years preceding or following. The period with the most extreme occurrence of this pattern is the early 1960s through the early 1970s. A second, less extreme, period with such a pattern is the 1990s. Particularly for the first and more extreme of these periods, increases in visitation as reported may be more a product of the reporting methodology at the time than any real increase in visitation.

ARTICLES ABOUT VISITOR USE ESTIMATION IN ACADIA

Two articles discussing a method for visitor use estimation in Acadia National Park (Acadia) were shared with project participants to stimulate thought about alternative methods for counting and estimating visitor use.

Acadia, like HOSP, is a complex park with urban adjacent and wild areas, multiple and multi-modal transportation corridors, and a patchwork of park lands and inholdings. Also, both

Acadia and HOSP receive multiple types of visits, including relatively high numbers of non-recreational visitors. These factors make counting and estimating visitor use complex.

The methodology described for Acadia forgoes annual efforts to count each visitor to the park. Instead, it monitors visitor use at one key location that serves as a proxy for visitation to the park as a whole. An intensive initial counting and survey effort determined the percentage of all visits to the park that are counted at the key monitoring location once or more than once. With this information, the count generated at the key location can be adjusted to generate an estimate of visitor use for the whole park. In years subsequent to the initial survey and counting effort, only operation of the key location counter is required to generate an accurate estimate of visitor use.

3.0 SCOPING TRIP

RSG staff, accompanied by NPS SSB staff, visited HOSP for an onsite scoping visit on Thursday October 8th and Friday October 9th 2015. The scoping trip served to familiarize RSG and NPS SSB staff with HOSP, its visitor use patterns, and its visitor counting infrastructure and procedures.

During the scoping trip:

- HOSP staff provided an overview of the park, recent management activities and plans for the future, visitor use patterns, and visitor use counting infrastructure and procedures
- NPS SSB staff reviewed current visitor use counting and estimation procedures
- All participants discussed issues with current visitor use counting and estimation infrastructure and procedures
- RSG staff introduced alternative approaches to counting and estimating visitor use at HOSP

These activities are reviewed in the following sections of this report.

3.1 | AGENDA & PARTICIPANTS

Participants in the scoping trip included staff from HOSP, NPS SSB, and RSG. The agenda for the onsite scoping visitor is presented in Appendix A.

It should be specially noted that HOSP staff was fully involved in the scoping trip throughout its duration. This full involvement substantially improved the productivity and efficiency of the scoping trip.

HOSP Staff Participants

- Josie Fernandez, Superintendent
- Tricia Horn, Management Assistant
- Michael Kusch, Chief of Resources Management and Visitor Services
- Mark Scott, Facilities Manager
- Stacey Jackson, Buildings & Utilities
- Walter Abbott, Trails & Fire

NPS SSB Participants

- Pam Ziesler, PUSCRP

RSG Staff

- Steve Lawson, Director - Project Manager
- Nathan Reigner, Consultant

3.2 | OVERVIEW OF HOT SPRINGS NATIONAL PARK

HOSP staff led several discussions and excursions to provide scoping trip participants with an overview of the park, and its visitor use and visitor use counting infrastructure. The first

substantive session of the scoping trip was dedicated specifically to a HOSP staff led overview of the park and its visitor use.

The primary field excursion, made as a group traveling together in the same vehicle, was taken during the afternoon of October 8th. In this excursion, participants toured all areas of the park, stopping frequently to examine park facilities, directly observe visitor use, and ask and discuss questions about visitor use patterns and park infrastructure related to visitor use counting and estimating procedures. RSG and NPS SSB staff made additional, smaller and less formal, excursions to the park throughout their two days onsite. These additional excursions were made throughout the day, allowing observation of a diversity of visitor use.

The following section of the report synthesizes the information gleaned from the numerous discussions and excursions characterizing the park and its visitor use.

SITES, USES, AND USERS OF HOSP

For the purposes of better understanding visitor use in HOSP we subdivided the park and its users into the following five districts based on visitor activities and geography:

- Jug Fountains
- Downtown
- West Mountain
- Hot Springs Mountain
- Gulpha Gorge

These districts are presented as an initial organizational framework to help structure discussion and analysis of visitor use in the park. There are other ways that HOSP and its visitor use can be organized. However, this set of districts emerged from the scoping trip as a comprehensive and intuitive way to describe the park's visitor use. These districts also align with elements of the existing visitor use counting and estimation procedures.

Jug Fountains

Five fountains facilitating public access to HOSP spring waters are available for 24-hour visitor use in downtown Hot Springs, AR. The following four of these are within the boundary of HOSP:

- Headquarters – thermal water
- Libby Memorial Physical Medicine Center – thermal water
- Happy Hollow Spring – cold water
- Whittington Spring – cold water

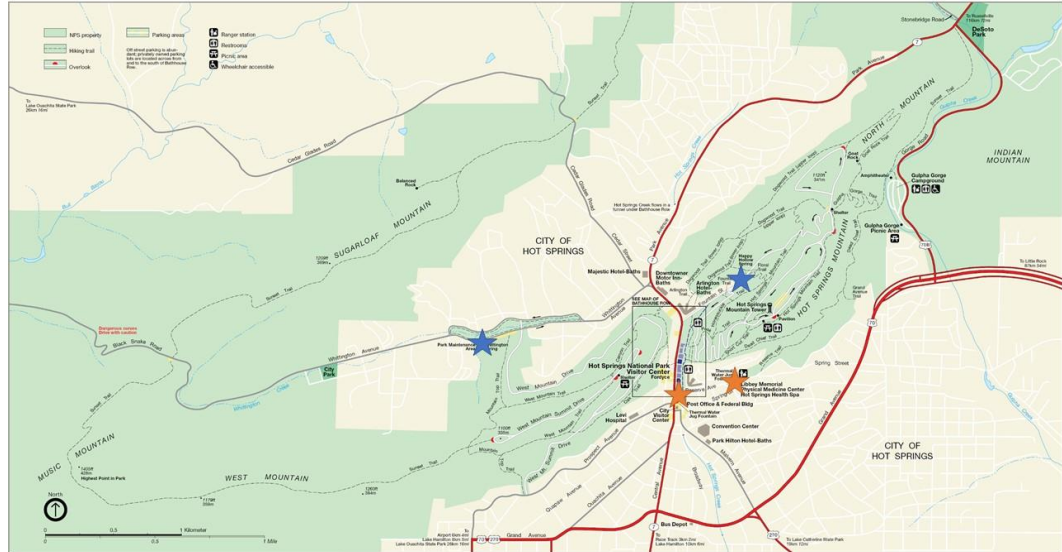


FIGURE 1: JUG FOUNTAIN DISTRICT (THERMAL WATER MARKED IN ORANGE, COLD WATER MARKED IN BLUE)

Jug fountains are visited for relatively short periods of time by individuals and groups filling containers with the park’s water. There is not limit on the amount of water that can be taken from fountains, as long as it is for personal use. The “jugs” visitors were observed filling during the scoping trip ranged from small, disposable water bottles to five-gallon buckets and similarly sized vessels. Some visitors frequent the fountains for substantial quantities of water, filling van- or truck-loads of large, reusable jugs. The water flowing through jug fountains is metered by HOSP.



FIGURE 2: THERMAL JUG FOUNTAIN AT PARK HEADQUARTERS



FIGURE 3: COLD WATER JUG FOUNTAIN AT WHITTINGTON PARK

Downtown

The downtown district of HOSP is perhaps the most complex and diverse in the park. The downtown district includes Bathhouse Row, the Arlington Lawn, the Grand Promenade, and several other walkways and features.

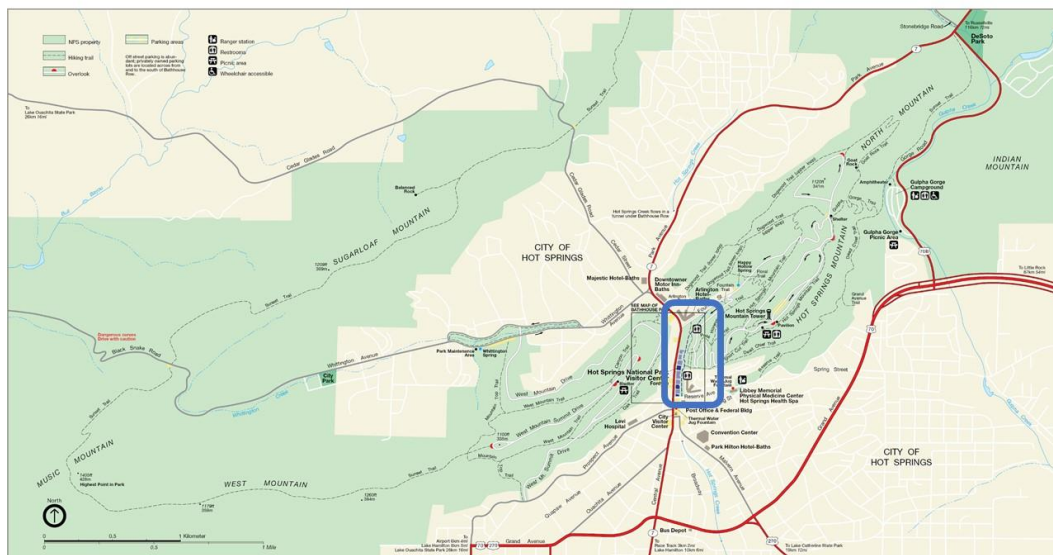


FIGURE 4: DOWNTOWN DISTRICT

The downtown district is seamlessly integrated with the City of Hot Springs to the south, west, and north and with the Hot Springs Mountain district of HOSP to the east. The southern boundary is the northern curb of Reserve Street. The western boundary is the eastern curb of Central Avenue. The northern boundary is the southern curb of Fountain Street. Consequently, when pedestrians in downtown Hot Springs walk on the north, east, and south sidewalks of these city streets, they are visiting HOSP. These sidewalk boundaries

and flow of urban park visitors across and along them are primary factors contributing to the complexity of counting and estimating visitor use at HOSP.



FIGURE 5: BATHHOUSE ROW, PARK BOUNDARY RUNS ALONG THE STREET CURB

Bathhouse Row, an iconic and historical resource of HOSP, runs along Central Avenue and anchors the downtown district of the park. Bathhouse Row, as its name implies, is a row of historic, thermal water bathhouses. The park headquarters building is located at the southern end of Bathhouse Row. Each bathhouse is named. Most are now occupied by park facilities or private businesses leasing the structures. From south to north, the bathhouses are as follows:

- Lamar – park gift shop (Bathhouse Row Emporium) operated by a park concessioner, park staff offices
- Buskstaff – bathhouse offering the traditional Hot Springs bathing experience operated by park concessioner
- Ozark – art museum and cultural center operated by Friends of Hot Springs National Park
- Quapaw –bathhouse offering a modern spa experience operated as an independent business under a lease for the building
- Fordyce – Hot Springs National Park Visitor Center and Museum
- Maurice – currently vacant
- Hale – currently vacant, leased to an independent business to be operated as a small hotel (2016 anticipated opening)

- Superior – Superior Bathhouse Brewery and Distillery operating as a restaurant, brewery, and distillery by an independent business under a lease for the building



FIGURE 6: BATHHOUSE ROW

The Arlington Lawn is a public greenspace of approximately 2.5 acres, north of Bathhouse Row. It derives its name from the Arlington Hotel across the street. The Arlington Lawn is open for informal public recreation as well as organized, park-supported or permitted events. Its facilities include walking paths, benches, a small amphitheater, a gazebo, a thermal fountain, and interpretive information including a tufa rock. HOSP visits to Arlington Lawn are diverse, ranging from attending a park-sponsored program to simply walking across the lawn as a shortcut traveling between downtown locations outside of the park.



FIGURE 7: AMPHITHEATER AND THERMAL FOUNTAIN ON ARLINGTON LAWN, SUPERINTENDENT FERNANDEZ DEPUTIZES JUNIOR RANGERS



FIGURE 8: ARLINGTON LAWN

The Grand Promenade is a brick walkway paralleling Central Avenue behind Bathhouse Row. The promenade runs along the base of Hot Springs Mountain. Its elevation provides views over the bathhouses of Bathhouse Row into downtown Hot Springs. Primary access points for the Grand Promenade are a ramp ascending from Fountain Street at the promenade's northern end and stairs ascending from Reserve Street at the promenade's southern end. A number of paved and unpaved walking paths, staircases, and trails connect it to Bathhouse Row below and the trails and roads of Hot Springs Mountain above. Some of the connections between Bathhouse Row and the Grand Promenade pass "display springs," or small springs depicting the state of the area's hot springs before they were developed.



FIGURE 9: GRAND PROMENADE



FIGURE 10: MAIN ENTRANCE TO THE GRAND PROMENADE



FIGURE 11: PATH CONNECTING GRAND PROMENADE AND BATHHOUSE ROW

West Mountain

The West Mountain district is primarily comprised of West, Music, and Sugarloaf Mountains and the valleys connecting them. These mountains are mostly wooded. Whittington Park is adjacent to the West Mountain district. Three primary recreational opportunities are present within the West Mountain district: scenic roads, trails, and Whittington Park.

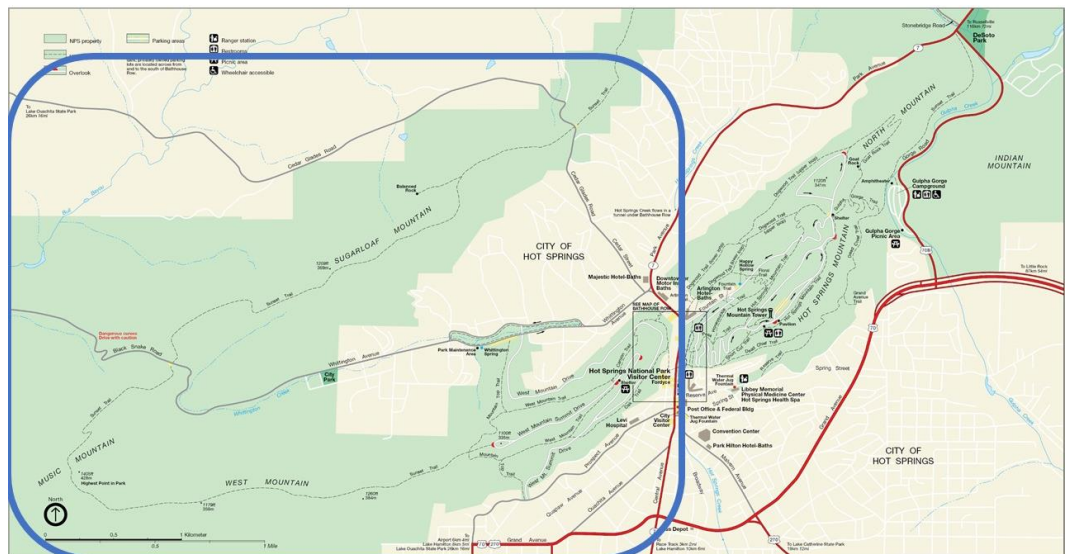


FIGURE 12: WEST MOUNTAIN DISTRICT

West Mountain Drive and West Mountain Summit Drive are scenic roads in the southeast corner of the West Mountain district. While West Mountain Drive can provide utilitarian connectivity for drivers, the character of the road and its users suggests that the overwhelming majority of its use is recreational. West Mountain Summit Drive, being a cul-de-sac that accesses only visitor use areas of HOSP, is exclusively recreational. Scenic overlooks, picnic areas, and trailhead parking are located at intervals along these roads. These roads provide road-based recreation for motorists, cyclists, and pedestrians. Gates to West Mountain Drive are closed daily between 10 pm and 6 am.

Black Snake Road traverses the valley separating Music and Sugarloaf Mountains. Cedar Glades Road traverses the valley separating the West Mountain district from the Hot Springs Mountain district. While scenic, these roads are primarily utilitarian corridors connecting the City of Hot Spring with points west. The roads' primary role in park visitation is access to trailhead parking for the Sunset Trail.

The West Mountain district has numerous opportunities for trail based recreation. These include direct connections to Hot Springs neighborhoods (Mountain Top Trail) and the downtown area (Canyon and Oak Trails), and more extended and wild trail opportunities (Sunset Trail). The number and connectivity of trails near West Mountain and West Mountain Summit Drives allow for a diversity of routes and trip durations. Pedestrians and equestrians are permitted on trails.

Whittington Park is located on Whittington Avenue north of West Mountain Drive. While it is adjacent and connected to the West Mountain roads and trails described above, its recreational character is quite different. Whittington Park functions as an urban greenspace. Long, narrow, flat, and landscaped, Whittington Park is ringed by a 1.2 mile long gravel path (Whittington Trail) that is popular with runners and walkers. In the summer, free and public events, including concerts, are held in the park.

Hot Springs Mountain

The Hot Springs Mountain district is east and north of downtown Hot Springs. The district includes Hot Springs and North Mountains, and Reservoir Ridge. These mountains are mostly wooded and have a relatively wild character. Two primary recreational opportunities are present within the Hot Springs Mountain district: scenic road and trail opportunities. Additionally, a concession-operated lookout tower is located near the summit of Hot Springs Mountain.

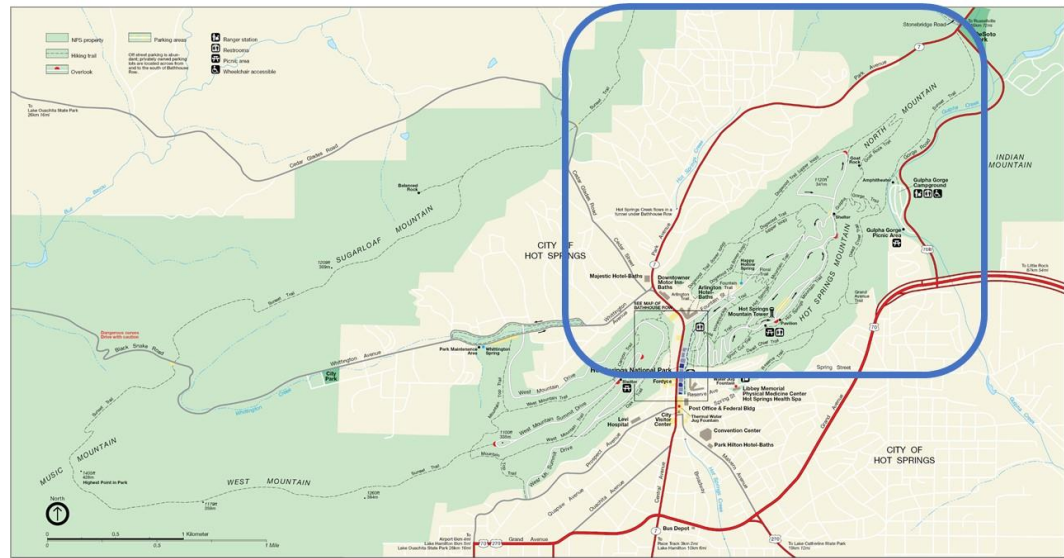


FIGURE 13: HOT SPRINGS MOUNTAIN DISTRICT

Hot Springs Mountain Drive and North Mountain Loop are scenic roads in the southwest corner of the Hot Springs Mountain district. As both routes access only visitor use areas of HOSP, all traffic on the roads is recreational. Scenic overlooks, picnic areas, and trailhead parking are located at intervals along these roads. These roads provide road-based recreation for motorists, cyclists, and pedestrians. A gate to Hot Spring Mountain Road is closed daily between 10 pm and 6 am.

Cedar Glades Road traverses the valley separating the West Mountain district from the Hot Springs Mountain district. Stone Bridge and Gulpha Gorge Roads pass through HOSP land north and east of North Mountain, respectively. While scenic, these roads are primarily utilitarian travel corridors. The roads do provide some access to recreation within the park, including access to trailheads and the Gulpha Gorge Campground and day use area.

The Hot Springs Mountain district has numerous opportunities for trail based recreation. These opportunities include direct connections to Hot Springs neighborhoods (Reserve, Grand Avenue, and Dogwood Trails), the downtown district via the Grand Promenade (Old Carriage Road, Peak, and Dead Chief Trails), and more extended and wild trail opportunities (Goat Rock, Fordyce Peak, and Sunset Trails). The number and connectivity of trails near Hot Springs Mountain Drive and the North Mountain Loop allows for a diversity of routes

and trip durations. Additionally, the Hot Springs Mountain district's trail network connects to the Gulpha Gorge Campground. Pedestrians and equestrians are permitted on trails.

The Hot Springs Mountain Tower is a concessionaire-operated lookout tower near the summit of Hot Springs Mountain. It is a primary destination for visitors on Hot Springs Mountain. It can be accessed by road or trail.

Gulpha Gorge

The Gulpha Gorge district is accessed primarily by the Gulpha Gorge Road. The trail network of the Hot Springs Mountain district also provides access to the Gulpha Gorge district. The Gulpha Gorge Campground has forty campsites for public use, 29 with RV hookups and 11 without RV hookups. Fees for camping are collected via a fee machine stationed within the campground. A campground host is present to assist visitors and monitor compliance with park regulations, including fees. The district also has a day use area with picnic tables, open lawns, and access to the Gulpha Creek. The campground and day use area have comfort stations that provide service to campers, day users, and travelers along the Gulpha Gorge Road.

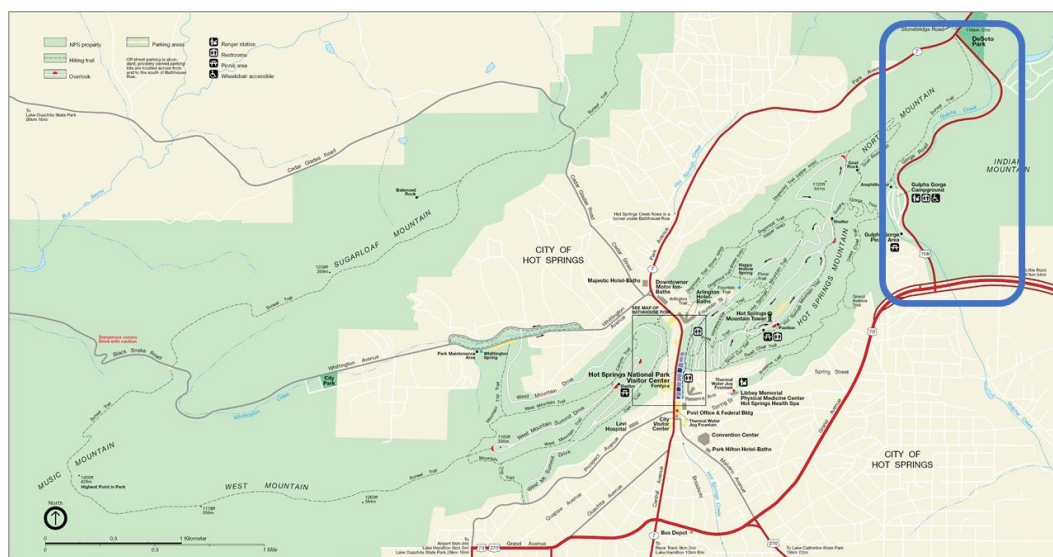


FIGURE 14: GULPHA GORGE DISTRICT

MANAGEMENT OF HOSP

Management activities at HOSP have resulted in substantial changes to visitor use patterns that significantly impact the effectiveness of existing visitor use counting and estimation procedures. Park management actions that may be implemented in the coming years have potential to further influence the efficacy of existing visitor use counting and estimation procedures. To be of greatest utility, any future visitor counting and estimation procedures should account for past and potential future management actions.

Bathhouse Row Visitor Use Expansion

Leasing and development of formerly vacant bathhouses on Bathhouse Row is a central accomplishment of recent HOSP management. Since the closure of seven of the eight bathhouses during the 1960s, 1970s, and 1980s, the buildings on Bathhouse Row were largely devoid of visitor use opportunities within the structures. When the current visitor use counting and estimation procedures were developed, only the Buckstaff and Fordyce bathhouses were open to the public. However, in recent years park management has dedicated itself to reinvigorating adaptive use of the buildings. As of the drafting of this report, six of eight of the bathhouses are open for various types of visitor use. A seventh is scheduled to open for visitor use as a hotel in 2016.

The expansion of visitor use on Bathhouse Row has both increased the magnitude and altered the pattern of visitor use in HOSP. With more visitor experience opportunities present in the park, more visitors are attracted to and using HOSP for recreation. Further, the visitor experience opportunities along Bathhouse Row are diverse. They include:

- an art museum and cultural space,
- traditional bathhouse,
- emporium and gift shop,
- modern spa and bathhouse,
- visitor center and museum,
- boutique hotel,
- restaurant, brewery, and distillery.

In comparison to the mix of experiences present when the current counting and estimation procedures were developed, current visitor use opportunities are greatly expanded and diversified. Now HOSP receives many different types of visitors, engaged in different types of activities, for different durations, at different times of day than when the current counting and estimation procedures were developed.

Gulpha Gorge Campground Development

Recently, the Gulpha Gorge Campground was redeveloped to include RV hookups at 29 of its campsites. These hookups offer electrical, water, and sewer connections to campers. With the addition of utility hookups, visitor use of the Gulpha Gorge Campground expanded from primarily warm weather use to year round use. The presence of campers in the campground for additional portions of the year likely altered the pattern of visits to HOSP in ways not accounted for by current visitor use counting and estimation procedures.

Regional Transportation Projects

The Hot Springs region is a vibrant and developing metropolitan area with active and planned transportation projects that do and will affect park visitation, visitor experiences, and the traffic flow along park roads and pedestrian walkways. Examples of these projects include the connection of the bike path along Hot Springs Creek to the Grand Promenade and the proposed commuter bypass east of Hot Springs between Routes 7 and 70. These

and similar potential future transportation and development projects could dramatically affect the pattern and volume of visitor use in HOSP.

3.3 | VISITOR USE COUNTING AND ESTIMATION PROCEDURES

The current visitor use counting and estimation methodology was implemented on January 1, 2008. It is summarized in Hot Springs National Park Public Use Counting and Reporting Procedures, a document included in the pre-trip briefing packet (Appendix A). The process that led the development and adoption of this specific methodology is unknown. However, the adaptation of HOSP's counting and estimation procedures since 1992 was summarized by NPS SSB staff and presented during the scoping trip. This summary is attached as Appendix B. These changes represent minor revisions to a basic strategy that has remained relatively consistent since 1992.

The counting and estimation methodology for HOSP must generate six types of visitation estimates. These types of counts are briefly described below. Appendix C provides more detailed definitions of these categories and some of the components that contribute to them.

- **Recreation visits** – the entry of a person onto lands or waters administered by NPS for recreational purposes for any part of one day
- **Non-recreation visits** – the entry of non-NPS staff onto lands or waters administered by NPS for purposes other than recreation for any part of one day
- **Non-reportable visits** – the entry onto lands or waters administered by NPS by NPS employees, their families, concessionaire employees, etc. for purposes other than recreation for any part of one day
- **Recreation visitor hours** – the cumulative amount of continuous, intermittent, or simultaneous periods of time spent on lands or waters administered by NPS by persons engaged in activities qualifying as recreation visits
- **Non-recreation visitor hours** – the cumulative amount of continuous, intermittent, or simultaneous periods of time spent on lands or waters administered by NPS by persons engaged in activities qualifying as non-recreation visits
- **Overnight stays** – one night spent on lands or waters administered by NPS by a visitor

The visitor use counting and estimation procedures for HOSP are made operational with combination data. These data include counts generated by electronic counting equipment arrayed throughout HOSP, other sources of count data generated by park staff or stakeholders, fixed values, and multiplication factors to adjust counts for visitor characteristics and length of stay. These elements are outlined in Appendix D. The data are combined using formulas designed to correct and expand counts to estimate the six count types defined above. The following sections enumerate the sources and applications of count data within the current HOSP visitor use counting and estimation procedure.

SOURCES OF COUNT DATA

Twenty-one counts or estimates are or have recently been included in HOSP's visitor use counting and estimation procedures. Fourteen of them are used in the current procedure. The following list of count sources describes each count and its sources of data, and notes if it is not included in the current procedures. Each count is keyed by letter to a list of data inputs from PUSCRP and to locations depicted on the map included in Appendix D.

- A** Inductive loop counter counting the number vehicles exiting Hot Spring Mountain Drive. The counter is located just uphill of the gate past Happy Hollow Spring.
- B** Inductive loop counter counting the number of vehicles entering West Mountain Summit Drive.
- C** Inductive loop counter counting the number of vehicles entering the northbound lane of West Mountain Drive. The counter is located at the southern end of West Mountain Drive.
- D** Inductive loop counter counting the number of vehicles traveling the southbound lane of West Mountain Drive. The counter is located at the southern end of West Mountain Drive.
- E** Inductive loop counter counting the number of vehicles traveling the northbound lane of Gulpha Gorge Road (70B). The counter is located just south of the entrance to Gulpha Gorge Campground.
- F** Inductive loop counter counting the number of vehicles traveling the southbound lane of Gulpha Gorge Road (70B). The counter is located just north of the entrance to Gulpha Gorge Campground.
- G** Reflected beam pedestrian counter counting the number of individuals entering and exiting the front door of the Fordyce Bathhouse (HOSP Visitor Center and Museum). The counter is located just inside the bathhouse's front door. *This count is not used in the current counting and estimation methodology.*
- H** Manual count of visitors entering the Ozark Bathhouse (art museum and cultural center). This count is collected by museum staff using a hand-operated tally counter and paper log form.
- I** Administrative estimate of the number of visitors in the park as part of special use permitted events. These counts are generated by HOSP staff using a combination of special use permit application information, reports provided by special use permit holders, and administrative judgement. An example of special use count data that may be included in this category is attached as Appendix E.
- J** Active beam pedestrian counter counting the number of visitors passing the counter while walking on the Grand Promenade. This counter is located at the north end of the Grand Promenade.

- K** Active beam pedestrian counter counting the number of visitors passing the counter while walking on the Grand Promenade. This counter is located at the south end of the Grand Promenade.
- L** Buckstaff Bathhouse entrance count. *This count is not used in the current counting and estimation methodology.*
- M** Buckstaff Bathhouse massage count. *This count is not used in the current counting and estimation methodology.*
- N** Quapaw Bathhouse pool user count. *This count is not used in the current counting and estimation methodology.*
- O** Quapaw Bathhouse massage count. *This count is not used in the current counting and estimation methodology.*
- P** Active beam pedestrian counter counting the number of visitors passing the counter while walking on the sidewalk of Bathhouse Row. This counter is located just north of the entrance to the Fordyce Bathhouse.
- Q** Active beam pedestrian counter counting the number of visitors passing the counter while walking on the sidewalk of Bathhouse Row. This counter is located just south of the entrance to the Fordyce Bathhouse.
- R** Administrative count of the number of the number of tent campers in the Gulpha Gorge Campground. This count was generated by the campground's fee collection machine. The current fee collection machine does not produce the data necessary to generate this count.
- S** Administrative count of the number of the number of RV campers in the Gulpha Gorge Campground. This count was generated by the campground's fee collection machine. The current fee collection machine does not produce the data necessary to generate this count.
- T** Hot Springs Mountain lookout tower visitor count. *This count is not used in the current counting and estimation methodology.*
- U** Count of the number of buses entering HOSP. *This count is not used in the current counting and estimation methodology.*

VISIT ESTIMATION PROCEDURES

HOSP has six visit estimation methodologies, one for each type of visit that is included in its public use statistics (recreation visits, non-recreation visits, non-reportable visits, recreation visitor hours, non-recreation visitor hours, overnight stays). Visitor use is counted and estimated on a monthly basis.

Recreation Visits

The number of recreation visits to HOSP is estimated within the current procedures using formulas to combine data from traffic counters, pedestrian counters, manual counts, administrative estimates, and correction factors. Locations for data sources include:

- Three roads (Hot Springs and West Mountain Summit Drives and Gulpha Gorge Road)
- Two walkways (Bathhouse Row sidewalk and the Grand Promenade)
- Four thermal jug fountains
- The Ozark Bathhouse
- Special use permitted events

The following outline presents a list of the values that are summed to generate the estimate of recreational visits to HOSP. Several of these values are themselves the product of functions applied to combine, expand, and/or correct counts. These functions are written using the variable codes presented in Appendix D.

Recreational visits to HOSP = **Y1 + Y2 + Y3 + Y4 + Y5 + H + I + Y6** where:

- Recreational visits to Hot Springs Mountain Drive: **Y1 = (A – X1) x X8**
 - Number of vehicles exiting Hot Springs Mountain Drive: **A**
 - Less 350 non-reportable vehicles: **X1**
 - Multiplied by 2.5 people per recreational vehicle: **X8**
- Recreational visits to West Mountain Summit Drive: **Y2 = (B – X2) x X8**
 - Number of vehicles entering West Mountain Summit Drive: **B**
 - Less 250 non-reportable vehicles: **X2**
 - Multiplied by 2.5 people per recreational vehicle: **X8**
- Recreational visits along the Gulpha Gorge Road: **Y3 = (((E – X5) x X10 or X11) x X8) + (((F – X6) x X10 or X11) x X8)**
 - Number of vehicles traveling northbound on Gulpha Gorge Road prior to passing the Gulpha Gorge Campground: **E**
 - Less 450 non-reportable vehicles: **X5**
 - Multiplied by the percentage of all vehicles that are classified as recreational: **X10** (May – October) or **X11** (November – April)
 - Multiplied by 2.5 people per recreational vehicle: **X8**
 - Number of vehicles traveling southbound on Gulpha Gorge Road prior to passing the Gulpha Gorge Campground: **F**
 - Less 200 non-reportable vehicles: **X6**
 - Multiplied by the percentage of all vehicles that are classified as recreational: **X10** (May – October) or **X11** (November – April)
 - Multiplied by 2.5 people per recreational vehicle: **X8**

- Recreational visits to Bathhouse Row: $Y4 = P/X16 + Q/X16$
 - Number of pedestrians counted passing the Bathhouse Row North counter: **P**
 - Divided by 2 to account for entry & exit: **X16**
 - Number of pedestrians counted passing the Bathhouse Row North counter: **Q**
 - Divided by 2 to account for entry & exit: **X16**
- Recreational users of the thermal jug fountains: $Y5 = X7$
 - Fixed value of 10,800 visits: **X7**
- Recreational visits to the Ozark Bathhouse and its art museum and cultural center: **H**
 - Number of visitors entering the Ozark Bathhouse: **H**
- Recreational visits from activities managed under special use permit: **I**
 - Number of visitors estimated to have participated in special use permitted events: **I**
- Recreational use of the Grand Promenade: $Y6 = J/X16 + K/X16$
 - Number of pedestrians counted passing the Grand Promenade North counter: **J**
 - Divided by 2 to account for entry & exit: **X16**
 - Number of pedestrians counted passing the Grand Promenade South counter: **K**
 - Divided by 2 to account for entry & exit: **X16**

Non-Recreation Visits

The number of non-recreation visits is estimated using data from traffic counters on three roads (West Mountain Summit and West Mountain Drives, and Gulpha Gorge Road). The following outline presents a list of the values that are summed to generate the estimate of non-recreational visits to HOSP. Several of these values are themselves the product of functions applied to combine, expand, and/or correct counts. These functions are written using the variable codes appearing in Appendix D.

Non-recreational visits to HOSP = $Y7 + Y8$ where:

- Non-recreational visits to West Mountain: $Y7 = (((C - X2) - X14) \times X9) \times X15 + (((D - X2) - X14) \times X9) \times X15$
 - Number of vehicles traveling northbound on West Mountain Drive at the southern end of the road: **C**

- Less 250 non-reportable vehicles: **X3**
 - Less the 50% of number of vehicles entering West Mountain Summit Drive (**B/2**) to account for recreational traffic on West Mountain Summit Drive: **X14**
 - Multiplied by 1.5 people per non-recreational vehicle: **X9**
 - Multiplied by 0.65 to account for same day reentries: **X15**
- Number of vehicles traveling southbound on West Mountain Drive at the southern end of the road: **D**
 - Less 200 non-reportable vehicles: **X4**
 - Less the 50% of number of vehicles entering West Mountain Summit Drive (**B/2**) to account for recreational traffic on West Mountain Summit Drive: **X14**
 - Multiplied by 1.5 people per non-recreational vehicle: **X9**
 - Multiplied by 0.65 to account for same day reentries: **X15**
- Non-recreational visits along the Gulpha Gorge Road: $Y8 = (((E - X5) \times X12) \times X9) \times X15 + (((F - X6) \times X11) \times X9) \times X15$
 - Number of vehicles traveling northbound on Gulpha Gorge Road prior to passing the Gulpha Gorge Campground: **E**
 - Less 450 non-reportable vehicles: **X5**
 - Multiplied by the percentage of all vehicles that are classified as non-recreational: **X12** (May – October) or **X13** (November – April)
 - Multiplied by 1.5 people per non-recreational vehicle: **X9**
 - Multiplied by 0.65 to account for same day reentries: **X15**
 - Number of vehicles traveling southbound on Gulpha Gorge Road prior to passing the Gulpha Gorge Campground: **F**
 - Less 200 non-reportable vehicles: **X6**
 - Multiplied by the percentage of all vehicles that are classified as non-recreational: **X12** (May – October) or **X13** (November – April)
 - Multiplied by 1.5 people per non-recreational vehicle: **X9**
 - Multiplied by 0.65 to account for same day reentries: **X15**

Non-Reportable Visits

Non-reportable visits are removed from recreation and non-recreation visit calculations by subtracting out a fixed number of non-reportable vehicles from vehicle traffic counts. The following outline presents a list of the values that are summed to generate the estimate of non-reportable visits to HOSP. This outline uses the variable codes appearing in Appendix D.

1,700 non-reportable visits are estimated for HOSP each month. This estimated is generated with the function **X1 + X2 + X3 + X4 + X5 + X6** where:

- **X1** = 350 non-reportable vehicles exiting Hot Springs Mountain Drive
- **X2** = 250 non-reportable vehicles entering West Mountain Summit Drive
- **X3** = 250 non-reportable vehicles traveling northbound on West Mountain Drive at the road's southern end
- **X4** = 200 non-reportable vehicles traveling southbound on West Mountain Drive at the road's southern end
- **X5** = 450 non-reportable vehicles traveling northbound on Gulpha Gorge Road prior to passing the Gulpha Gorge Campground
- **X6** = 200 non-reportable vehicles traveling southbound on Gulpha Gorge Road prior to passing the Gulpha Gorge Campground

Recreation Visitor Hours

Recreation visitor hours are estimated by multiplying estimates of recreational visitor use described above by length of stay factors. The following table presents the multiplication factors to transform estimates of recreational visits/month to estimates of visitor hours/month.

TABLE 1: LENGTH OF STAY MULTIPLICATION FACTORS

LOCATION	LENGTH OF STAY
Recreational visits to Hot Springs Mountain Drive: Y1	0.8 hours (May – Oct.) 0.4 hours (Nov. – April)
Recreational visits to West Mountain Summit Drive: Y2	0.5 hours
Recreational visits along the Gulpha Gorge Road: Y3	0.2 hours
Recreational visits to Bathhouse Row: Y4	0.5 hours
Recreational users of the thermal jug fountains: Y5	0.2 hours
Recreational visits to the Ozark Bathhouse and its art museum and cultural center: H	
Recreational visits from activities managed under special use permit: I	
Recreational use of the Grand Promenade: Y6	

Non-recreation Visitor Hours

Non-recreation visitor hours are estimated by multiplying the estimate of the number of non-recreation visits by 0.2 hours/non-recreation visit.

Overnight Stays

Overnight stays are estimated from data collected on the number of campers staying in the Gulpha Gorge Campground each night. Until recently, overnight stay data was generated by the campground's fee collection machine.

3.4 | ISSUES WITH CURRENT PROCEDURES

The scoping trip revealed multiple issues that suggest the current visitor use counting and estimation procedures do not meet the needs of NPS and HOSP. These issues follow from the combination of equipment and procedures currently employed at HOSP, visitor use patterns at HOSP, and changes in park facilities and visitor use that have occurred since the current procedures were developed. The issues result in both over- and undercounting of visits of all types, and potential incorrect classification of visits into recreational and non-recreational categories.

In addition to these known issues, the quality of HOSP's current procedures are compromised by limited documentation and absent information about the counting system's performance. The rationale supporting many of the fixed values and multipliers used in the current methodology (i.e., variables keyed with an "X" value in Appendix D) is not documented or known by any current park or NPS SSB staff. Without documented rationale for these values and multipliers, the quality of the estimates generated by them can not be supported. The functional characteristics of HOSP's counting equipment are also unknown. This is most evident for the pedestrian counters along Bathhouse Row, which have not been calibrated to account for the extreme occlusion that can occur on high-use, wide pedestrian walkways. Additionally, the sensitivity of inductive loop counters to various types of roadway visitors use (e.g. bicycles and motorcycles) is unknown.

The following section of this report categorizes and outlines issues with HOSP's current visitor use counting and estimation procedures, including the infrastructure that supplies data for the procedures. The categories presented include issues associated with counting equipment, changes in park facilities and visitor use, classification of visit types, undercounting visits, overcounting visits, and unknown rationales for counting and estimation procedure elements.

ISSUES ASSOCIATED WITH COUNTING EQUIPMENT

Issues associated with counting equipment follow from characteristics of the equipment itself, functional incompatibilities between equipment and visitor use patterns the equipment is deployed to count, and operational and maintenance procedures for the equipment. The order of issues listed below does not reflect priority or significance.

- HOSP has a variety of counter makes and models. This requires staff to know how to operate multiple types of counters and to stock multiple types of counter supplies (batteries, replacement parts, accessories, etc.). Because each counter type has different power requirements, memory capacities, and user interfaces, universal maintenance and data downloading procedures cannot be implemented. Consequently, HOSP coordinates maintenance of each counter individually. This complicates maintenance and can lead to unmaintained counters, which compromises the accuracy of visitor use counts and estimates.
- The current methodology for HOSP relies on counts collected by no less than ten electronic counters. This number of counters exposes HOSP to numerous

opportunities for malfunction and requires substantial staff commitment to keep them all properly functioning. If one counter does not function properly, the accuracy of the all visitor use counting and estimation procedures can be compromised.

- Pedestrian counters on the Bathhouse Row sidewalk and Grand Promenade are installed in settings that challenge their functional capabilities. These counters are active beam counters that project an electro-magnetic beam from a transmitter across the pedestrian travelway to a reflector, which reflects the beam back to a receiver integrated in the transmitter unit. When the beam “broken,” a count is recorded. These counters work best when the transmitter/receiver and reflector are mounted close together and at the average height of a pedestrian’s torso, and when the beam is perpendicular to pedestrian traffic flow. HOSP’s active beam counters have transmitter/receivers and reflectors mounted distant from each other, low in comparison to height of visitors’ torsos, and sometimes diagonal to the flow of pedestrian traffic. These installation characteristics compromise the quality of counts generated by the pedestrian counters.
- Pedestrian counters are not calibrated. All pedestrian counters count inaccurately. There is some error between the true number of pedestrians that pass a counter’s location and the number of pedestrians the counter estimates to have passed. This error grows as the width of a path increases, the variability of pedestrian sizes and travel speeds increases, and the volume of pedestrian flow increases. Calibration of pedestrian counters correct this error by accounting for the general pattern of difference between counter estimates of pedestrian volume and true measures of pedestrian volume. Without calibration, the quality of estimates generated by pedestrian counters cannot be judged. Further, the installation characteristics of HOSP’s counters suggest that substantial error may be present in the many of the pedestrian counters’ estimates.
- Inductive loop counters on West Mountain, West Mountain Summit, and Hot Springs Mountain Drives are installed in settings that may challenge their functional capabilities. These counters are sited and installed to generate the only source data for visitation estimates for West and Hot Springs Mountains. However the counters may not be sensitive enough to record all users of the road, particularly cyclists and motorcyclists. No data exist on the sensitivity of these counters as installed. Consequently, the quality of the visitor use estimates they inform cannot be judged.
- Current procedures for accessing data from and maintaining the counters require multiple staff interactions that have potential to cost excessive time and lead to miscommunication that can compromise the continuity of counter operation. Law enforcement rangers are tasked with regular counter data downloads, but not with routine maintenance. Routine maintenance is assigned to buildings and utilities staff. This creates a situation where law enforcement may not be familiar with the characteristics of properly functioning counters and, consequently, many not notice

a malfunction that can compromise visitor use counts and estimates. If law enforcement does not notice a malfunction, it will perpetuate. If law enforcement does notice a malfunction, they must call buildings and utilities staff who must correctly understand the malfunction described by the untrained law enforcement officer and then find time to travel to and maintain the malfunctioning counter. This process can be time consuming and has opportunities for miscommunication. Additionally, park maintenance activities can interfere with proper counter function. For example, otherwise innocuous vegetation or facilities maintenance can alter or block the alignment of active beam infrared pedestrian counters causing them to malfunction. Staff that do this maintenance are not always familiar with the location and operation of counters; consequently, they may be unaware of the effects of their actions on counting equipment. The number and variety of counters within the park compound this set of challenges.

ISSUES ASSOCIATED WITH CHANGES IN PARK FACILITIES AND VISITOR USE

A number of significant changes have occurred within the park since the development of the current counting and estimation procedures that compromise the quality HOSP visitation estimates.

- Visitor use patterns on Bathhouse Row have altered dramatically since the current counting and estimation procedures were developed. Leasing of bathhouses and subsequent diversification of visitor opportunities, are the primary cause of the shift in visitor use patterns. Currently, Bathhouse Row visitation is counted with two pedestrian counters positioned on either side of the Fordyce Bathhouse and manual counts collected in the Ozark Bathhouse. While these counts may once have adequately described visitor use on Bathhouse Row, they do so no longer. This spatially concentrated approach to counting likely does not account for the substantial park visitation that is now distributed along the entire length of Bathhouse Row.
- Data required to estimate overnight stays was gathered from the fee collection machine in the Gulpha Gorge Campground. This fee machine has recently been replaced by a new machine that is not currently providing the group size or length of stay data needed to estimate overnight stays in HOSP.
- A 13 room hotel is scheduled to open in HOSP. Current procedures for counting and estimating overnight stays only account for visitors spending the night in the Gulpha Gorge Campground. These procedures must be amended to account for hotel guests when the hotel is open.

ISSUES ASSOCIATED WITH VISIT CATEGORIZATION

Visits to HOSP can be classified into one of three categories: recreation, non-recreation, or non-reportable. Current procedures for classification of visitors may not accurately categorize visits for the following reasons.

- In the current methodology, visits are categorized as recreational or non-recreational by the assumed percentage of monthly vehicle traffic volumes on park roads. However, traffic patterns of recreational and non-recreational do not typically vary with each other. For example, recreational traffic volume is highly variable by season, whereas non-recreational traffic volume is steady throughout the year. Using proportional percentages to categorize recreational and non-recreational traffic implies consistent covariation between the two types of traffic that likely does not exist, compromising the accuracy of recreational and non-recreational visit estimates.
- All visitor use counted and estimated in HOSP other than that accounted for on Hot Springs Mountain Road, Gulpha Gorge Road, and by fixed and relatively small non-reportable visit values, is considered recreational visitor use. However, substantial non-recreational and non-reportable use occurs at a number of locations in the park. Within the current counting and estimation procedures, these uses are incorrectly categorized or misrepresented.

ISSUES ASSOCIATED WITH UNDERCOUNTING VISITS

Recreational, non-recreational, and non-reportable visitor use in HOSP is dispersed and varied. The current procedures count and estimate visitation by seeking to enumerate individual visits. Within this approach, visits to HOSP are only included in visitation statistics if they:

- Ride in a vehicle on Hot Spring Mountain Drive
- Ride in a vehicle on West Mountain Summit Drive
- Ride in a vehicle entering or exiting the southern end of West Mountain Drive
- Ride in a vehicle on Gulpha Gorge Road past the Gulpha Gorge Campground
- Walk past the Fordyce Bathhouse on Bathhouse Row
- Enter the Ozark Bathhouse
- Participate in a special use permitted activity
- Walk on the north end of the Grand Promenade
- Walk on the south end of the Grand Promenade
- Use a thermal jug fountain

Visitors to HOSP can and do engage in many types of visits other than those that generate counts within the current system. Consequently, some types of visitation are undercounted. Visits that are undercounted include, but are not limited to:

- Riding a bike or walking on park roads
- Walking or riding a horse on park trails without crossing a road counter or passing a pedestrian counter
- Visiting Whittington Park
- Visiting Arlington Lawn
- Visiting any bathhouse other than the Ozark and without walking past the Bathhouse Row counters

- Walking on the Grand Promenade by entering and/or exiting at a location other than the northern or southern terminus

ISSUES ASSOCIATED WITH OVERCOUNTING VISITS

Just as the current procedures undercount many visits, they also overcount visits by counting single visits multiple times. This is particularly true for recreational visits.

A park visit occurs when an individual enters lands or waters administered by NPS for any part of a day. Under this definition, an individual may only generate one visit each day regardless of the number of times they leave and reenter the park or the number of activities in which they participate. Current visitor use counting and estimation procedures do not account for patterns of exit and reentry to the park by recreational visitors. Non-recreational visits are reduced by a factor of 0.65 to account for same day reentry (see value X15 in Appendix D).

The absence of any accounting for same day reentry among recreational visitors leads to potentially substantial overcounting of recreational visitor use. An example of a typical recreational visit illustrates this issue. In the same day a visitor might:

- Walk past the Fordyce Bathhouse on Bathhouse Row
- Visit the Ozark Bathhouse and its museum
- Walk along the Grand Promenade
- Get water from a thermal jug fountain
- Drive to West Mountain Summit
- Visit the Hot Springs Mountain Lookout Tower

This visit would be counted at each of the locations listed and, under the current visitor use counting and estimation procedures, contribute six visits to the park's public use statistics.

ISSUES ASSOCIATED WITH UNKNOWN PROCEDURAL RATIONALES

The current procedures for estimating visitor use at HOSP use a number of fixed values and adjustment factors to compute public use statistics. Fixed values and adjustment factors are applied to account for:

- Non-reportable uses of park roads
- Users of thermal jug fountains who are not counted individually
- Vehicle occupancies
- Proportions of counts that are generated by recreational visits
- Proportions of counts that are generated by non-recreational visits
- Seasonal differences in recreational vs. non-recreational use
- Same day reentry of non-recreational visitors
- Visitor routing past pedestrian counters
- Lengths of stay

The reasons for the specific values of these factors is not documented in any source known to current HOSP or PUSCRP staff. These factors have a significant influence on the

estimates of visitation generated by the current methodology. Without information on why these values are used or their relationship to current visitor use patterns, confidence in the estimates generated with them is necessarily low.

3.5 | ALTERNATIVE COUNTING AND ESTIMATION PROCEDURES

The scoping trip concluded with general discussion of alternative approaches to counting and estimating visitor use at HOSP. This conversation acknowledged the limitations and challenges of the current visitor use counting and estimation procedures, and sought to identify alternative approaches. No specific alternative was selected, nor were details of alternative procedures addressed. A recommendation for an alternative approach, including study plans and a rough order of magnitude cost estimate, are presented in the Visitor Use Estimation Study Strategy that accompanies this scoping trip report.

ALTERNATIVE APPROACHES FOR COUNTING AND ESTIMATING VISITOR USE

Approaches to counting and estimating visitor use can be categorized into two general types:

- Census approaches seek to estimate visitor use by counting and summing visits to generate parkwide use statistics.
- Modeling approaches seek to statistically expand a single count or subset of counts to estimate parkwide visitor use statistics.

Each of these approaches has strengths and weaknesses that follow from their respective administrative complexity, data needs, and outputs. The strengths and weaknesses can be compared with park needs to suggest an approach that is most appropriate for HOSP.

The visitor use counting and estimation procedures currently used at HOSP are of the census type. Visits are counted at numerous locations and summed to estimate total visitor use at HOSP. Census approaches, like that used at HOSP, have some strengths related to the detail of information provided and operational redundancy within the counting system. Census approaches generate counts of visitor use at many locations providing detailed site-specific information that can be useful for park planning and management. Multiple count locations provide some redundant security within the counting system. If counting at one location fails, visitor use data collection for the whole park is not compromised.

The multiple counts required within a census approach pose many challenges that may exceed the benefits of the approach. Ensuring proper function of and integrating data from multiple count locations can be difficult, time consuming, and expensive. As counting networks grow, the likelihood that some counts will be inaccurate or malfunction grows as well. Additionally, census approaches operate on the basic premise that all visitors can be identified and counted. This is a substantial, and perhaps insurmountable, challenge in a complex, porous, urban park like HOSP. If all visitors cannot be counted, count data must be adjusted upward to correct for uncounted visitors. If visitors are counted more than once

in a day, which occurs now at HOSP, census count data must also be adjusted downward. Development of these adjustment factors requires a significant initial research investment.

Modeling approaches to counting and estimating visitor use address many of the challenges of census approaches. Modeling approaches rely on a limited number of indicator counts to estimate overall park use. Operationally, limiting the number of counts required to estimate parkwide visitor use reduces administrative burden, expense, and the number of counts that can malfunction. Conceptually, modeling approaches eliminate the need to count all visitors, an endeavor that is exceedingly difficult in a park like HOSP. Using statistical relationships to estimate parkwide visitation via a limited set of counts effectively accounts for dispersed visitor use in porous settings.

Modeling approaches are not without their challenges. Three primary considerations must be addressed for them to be effective. First, substantial initial research is required to develop statistical relationships between key visitor use counts and parkwide visitation. This investment, however, is similar to that required by census approaches to correct for under- and overcounting. Second, for modeling approaches to be effective visitor use counts must correlate well with parkwide visitation. In a diverse and complex park like HOSP, there may be no single count with high enough correlation to drive visitor estimation models. In such case, a set of counts organized by geographic district may improve the accuracy of modeled estimates. Third, reliance on a limited number of counts does increase exposure to system failure should any single count malfunction. Reliable counting equipment and robust counting and maintenance procedures can mitigate this challenge.

4.0 CONCLUDING SUMMARY

This report describes the activities and findings of RSG's scoping trip to HOSP. The purpose of the trip was to develop an understanding of the park, its visitor use patterns, and visitor use counting and estimation procedures and infrastructure. Findings of the scoping trip suggest that current visitor use counting and estimation procedures at HOSP do not meet the information needs of the park and NPS because they are inefficient, inaccurate, and not fully documented.

In preparation for the scoping trip, RSG created and distributed a pre-trip briefing packet with trip planning materials, summaries of current counting and estimation procedures and results, and ideas to help brainstorm alternative approaches.

During the scoping trip, HOSP, PUSCRP, and RSG staff made detailed examinations of the current counting and estimation procedures, counting infrastructure, visitor use facilities and patterns, and the strengths and weaknesses of alternative approaches.

Following the scoping trip, RSG staff thoroughly analyzed HOSP's visitor use areas, patterns, and counting and estimation procedures. Additionally, RSG staff considered current visitor use counting and estimation procedures in comparison to use patterns, park infrastructure, and management requirements for accurate and well-documented visitation estimates. In doing so, issues with the current procedures that compromise their ability to satisfy park and NPS needs were identified.

The current visitor use counting and estimation procedures are not adequate for the needs of HOSP or NPS. Current estimates are likely inaccurate because they are based on:

- Counts generated by equipment that is prone to malfunction and mismatched to installation locations and visitor use conditions
- Out of date visitor use patterns and facility configurations
- Incorrect classification of recreational and non-recreational visitor use
- Counts that underrepresent some visits
- Counts that overrepresent some visits
- Expansion and reduction factors that are undocumented and potentially wrong

These limitations suggest that alternative visitor use counting and estimation approaches be considered to improve the accuracy of public use statistics and the efficiency of their development.

APPENDIX A. PRE-TRIP BRIEFING PACKET

Pre-Trip Briefing Packet

A pre-trip briefing packet was developed by RSG staff to prepare all participants in the project for a productive scoping trip. The briefing packet contained an agenda for the scoping trip, the current procedures for counting visitor use in HOSP, maps depicting key visitor use counting locations within the park, summaries of recent public use statistics, and articles describing a visitor use estimation procedure developed for Acadia National Park that may provide a useful model for approaching visitor use estimation at HOSP.

MEETING AGENDA

DATE: October 8 & 9, 2015

LOCATION: Park Headquarters, Hot Springs National Park (HOSP)

SUBJECT: Public Use Statistics Count Procedures Assessment & Refinement, HOSP: Initial Scoping & Assessment Field Visit

PURPOSE: NPS staff from HOSP and the Social Science Branch (SSB) will accompany RSG on an initial overview tour of HOSP to observe and discuss current conditions and challenges with regard to estimating overall park visitation in HOSP.

THURSDAY, OCTOBER 8, 2015

TIME	TOPIC
8:00 AM – 8:30 AM	Arrival and Coffee
8:30 AM – 8:45 AM	Welcome, Introductions, Review of Agenda (HOSP/RSG)
8:45 AM – 9:30 AM	Park Overview (HOSP)
	• Overview of park facilities, uses and users, visitor use volumes and patterns
	• Review of park plans for near- and mid-term future facilities, services, management, etc.
	• Q/A and Discussion
9:30 AM – 10:15 AM	HOSP Current Counting Procedures and Infrastructure (SSB)
10:15 AM – 10:30 AM	Break
10:30 AM – 12:30 PM	Site Visits – Bathhouse Row/In-town Sites, including Jr. Ranger Ceremony (All)
12:30 PM – 1:30 PM	Lunch
1:30 PM – 4:30 PM+	Site Visits – Mountain Sites, Campground, Other (All)
Evening	RSG work session/prep for Friday

FRIDAY, OCTOBER 9, 2015

TIME	TOPIC
8:00 AM – 8:30 AM	Arrival and Coffee
8:30 AM – 9:15 AM	Issues with Current Counting System (All)
9:15 AM – 10:15 AM	Conceptual Model for Revised Public Use Methodology (All)
10:15 AM – 10:30 AM	Break
10:30 AM – 11:15 AM	Data Needs to Develop and Apply the Methodology (All)
11:15 AM – 12:00 PM	Outline of How, Where, and When Data Would be Collected (All)
12:00 PM – 1:00 PM	Lunch
1:00 PM	Adjourn; RSG Follow-up Site Visits, as Needed



When Is A Visit Really a Visit? Public Use Reporting Study at Acadia NP

By Kenneth Hornback and Robert Manning

"The Government (is) very keen on amassing statistics. They collect them, add them, raise them to the nth power, take the cube root, and prepare wonderful diagrams. But you must never forget that every one of these figures comes in the first instance from the village watchman, who just puts down what he damn well pleases."

— Sir Josiah Stamp, 1880-1941

Despite the cynicism of the above epigraph, the National Park Service places considerable emphasis on measuring and reporting public use. In fact, the NPS has collected information regularly about public use since 1904. In the early days when park visitation was low and sporadic, superintendents themselves counted park visitors and recorded where they came from and how they got to the parks. In today's world, where visits to the national parks number in the hundreds of millions annually, this system will no longer suffice! Public use reporting has become more sophisticated.

Public Use Reporting is governed by NPS-82 and is administered by the Socio-Economic Studies Division (NPS Denver). The public use reporting system's objective is to design and implement a statistically valid, reliable, and uniform method of collecting and reporting public use data for each independent unit administered by the NPS. Public use statistics serve a variety of purposes, including measuring the impact of park visitation, gauging monthly work load requirements, and tracking visitation history and trends. Among the most important components of the public use reporting system are definition of terms, counting and reporting instructions, surveys, and audits.

Definitions

A visit is the central unit of analysis in the public use reporting system. A visit is defined as the entry of any person, except Service personnel, onto lands or waters administered by the NPS. However, there are three kinds of visits which must be counted and reported separately: *Recreation visits* [visits for recreation purposes]; *Nonrecreation visits* [visits for nonrecreation purposes, including (1) persons going to and from inholdings; (2) commuter traffic; (3) other through traffic; (4) trades-people with business in the park; (5) any activity a part of or incidental to the pursuit of a gainful occupation; (6) government personnel other than NPS employees with business in the park; (7) citizens in the park to discuss or hear about park business (e.g. public hearings)]; and *Nonreportable visits* [visits by (1) NPS employees, (2) their families, (3) concessioner employees, (4) members of Cooperating Associations, (5) activities associated with NPS cooperative agreements, (6) tenants of NPS property if not crossing significant NPS territory for access, (7) persons engaged in pursuit of specific legal rights of use (e.g. subsistence hunting and fishing), and (8) NPS contractors.]

Finally, *duplicate counting* (multiple entries on a single day) must be avoided. The major forms of duplicate counting are associated with (1) commuter traffic back and forth through the park, (2) visits to more than one area of a park with discontinuous boundaries, (3) visitor traffic back and forth to visit outside vendors, and (4) visitors residing outside the park making morning and afternoon visits.

Counting and Reporting Instructions (CRIs)

CRIs are prepared to reflect the unique site characteristics of each park. CRIs contain the procedures for measuring, compiling, and recording public use. For very straightforward and small scale areas, CRIs can be prepared informally. For larger and more complex areas, formal audits are needed.

Audits

Audits of each NPS unit are periodically conducted by the Statistical Office. Audits constitute detailed looks at the public use complexities of each park unit.

Surveys

Measurement of public use requires some knowledge of and about park visitors. This information is derived from periodic surveys. Visitor surveys produce multipliers or conversion factors used in public use reporting. Surveys are conducted (usually at three year intervals) to keep up with local economic, transportation, and demographic changes.

A Case Study: Acadia National Park

Acadia NP is exceptionally complex from the standpoint of public use reporting. It occupies about half of Mt. Desert Island, Maine, and consists of a patchwork of public lands interspersed with private lands. Numerous uncontrolled entrances and exits and park roads are traveled by large numbers of visitors, local residents, and others.

Acadia was audited by the Statistical Office in 1989 and, because of its complexity, a survey was deemed necessary in order to develop new Counting and Reporting Instructions. The emphasis of the public use reporting system was to be based on a "double sampling" procedure. This technique is commonly used where visitation is highly dispersed and difficult and expensive to count directly. A second more easily measurable variable is created and statistically related to visitation. Visitation then can be estimated by means of this new variable. In automobile-oriented parks such as Acadia this new or second variable often is automated automobile traffic counters. A traffic counter at Sand Beach, a principal park attraction, was designated as the focus of the double sampling system at Acadia.

The survey was begun in summer 1990 and conducted in each of the four major use seasons. Chosen for sampling were 30 park sites, representing the diversity of visitor attractions. Sampling was done on 70 days, and 2,873 visitors were given a short questionnaire. Variables of principal interest included reason for visit (recreation, nonrecreation, nonreportable), persons per vehicle, length of stay, and whether or not the visitors tripped the Sand Beach traffic counter on the days they were interviewed.

Survey findings are presented in Table 1. The first variable, the Sand Beach traffic counter multiplication factor, was calculated on the basis of the percentage of visitors who tripped the Sand Beach traffic counter. For example, during the summer season 46.9 percent of visitors sampled did not trip the counter on the day they were interviewed. This means the traffic counter is underestimating the number of visitor vehicles in the park and its reading must be adjusted upward accordingly. A majority of visitors (51.2%) tripped the traffic counter once, thus no adjustment is needed for these visitors. However, 1.8 percent of visitors tripped the counter twice, and an additional .1 percent tripped it three times, requiring an appropriate downward adjustment of the counter reading.

Aggregating all these adjustments, Sand Beach traffic counter readings should be adjusted upward using a multiplication factor of 1.81 for the summer season. Other variables needed to estimate public use are persons per vehicle (2.99 for the summer season) and type of visit (recreation visits=96.6%, nonrecreation visits=2.8%, non reportable visits=.6% for the summer season). Finally, length of stay can be factored in to further quantify public use. It is interesting to note the seasonal differences found among several of these variables.

Conclusion

Based on the above survey findings, a new CRI has been prepared by the Statistical Office and implemented at Acadia. The survey has provided an information base that substantially enhances the validity and reliability of public use reporting and ensures that the public use reporting system is in conformity with NPS guidelines.

Hornback is with the NPS Socio-economic Studies Division, Denver; Manning is Professor and Chair of the Recreation Management Program, School of Natural Resources, U/VT, Burlington.

Table 1. Variable	Season			
	Summer	Fall	Winter	Spring
Sand Beach traffic counter multiplication factor	1.81	1.73	5.88	4.02
Persons per vehicle	2.99	3.01	2.42	3.75
Type of visit				
Recreation	96.6%	97.8%	97.1%	99.2%
Nonrecreation	2.8%	2.0%	1.2%	0.8%
Nonreportable	0.6%	0.2%	1.7%	0.0%
Length of stay				
Recreation, day use	5.05 hrs	6.54 hrs	6.57 hrs	5.79 hrs
Recreation, overnight use	101.47 hrs	54.67 hrs	42.71 hrs	56.31 hrs

Verification of Acadia National Park Public Use Reporting

Introduction

The National Park Service is required to collect and report public use of the facilities under its administration. For purposes of efficiency, public use figures are often gathered by means of automated automobile traffic counters. However, use of such counters requires periodic counting and data collection directly from park visitors. These data determine purpose of park visit, length-of-stay, persons per vehicle, and other important characteristics of park use. These data are used to formulate multipliers which can be applied to traffic counter data. In this way, traffic counter data can be converted into estimates of park use. This results in an accurate and cost-efficient method of determining public use.

The purpose of this study is to conduct the visitor and counting data collection portion of the public use reporting requirements for Acadia National Park. This will require on-site sampling in the park. The result of this study will be a set of multipliers that can be used to estimate public use of the park based on traffic counters located in the park.

Specifications

1. The study will comprise four data collection periods to represent the Summer use season, the Fall use season, the Winter use season, and the Spring use season.
2. The Summer data collection period will be conducted from approximately late-June 1990 to mid-August 1990. This study period will be comprised of 28 8-hour days of personal interviews of park visitors.
3. The Fall data collection period will be conducted from approximately mid-September 1990 to late-October 1990. This study period will be comprised of 14 8-hour days of personal interviews with park visitors.
4. The Winter data collection period will be conducted from approximately

late-December 1990 to late-January 1991. This study period will be comprised of 14 8-hour days of personal interviews of park visitors.

5. The Spring data collection period will be conducted from approximately mid-April 1991 to late-May 1991. The study period will be comprised of 14 8-hour days of personal interviews with park visitors.
6. Data on visitor use will be collected from park visitors by means of personal interviews using standard questionnaires.
7. Interviews will be conducted with park visitors at locations within the park receiving significant visitations. Potential interview locations within the park include the following:

- Thompson Island Information Center
- Hulls Cove Visitor Center/Entrance
- Eagle Lake Parking Lot/Boat Ramp
- Parking Lot for Cadillac Mountain Hiking Trail
- Parking Lot for Kebo Mountain Hiking Trail
- Parking Lot Acadia Wild Garden Hiking Trail
- Sieur de Monts exit road
- Schooner Head road near at Overlook
- Precipice Trailhead
- Bear Brook Picnic area
- NPS Traffic Counter
- Sand Beach Parking Lot
- Otter Cliffs Road/Fabbri Picnic area
- Otter Point
- Little Hunters Beach
- Hunters Head
- Blackwoods Campground/Ranger Station
- Wildwood Stables
- Gate House
- Jordan Pond House/Parking Lot and Boat Ramp
- Bubble Rock Parking Area
- Park Lot for Sunset Point Hiking Trail
- Road to Cadillac Mountain
- Gate House Parking Lot
- Hadlock Pond Parking Lot
- Norumbegal Mountain Parking Lot
- Parkman Mountain Parking Area
- Sargent Drive
- Ikes Point Boat Ramp
- Acadia Mountain Parking Lot
- Echo Lake Beach Parking Lot
- Lurvey Spring Road
- Valley Cove Courtesy Mooring

Seawall Campground
Seal Cove Road
Seawall Picnic Area
Parking Lot Trailhead
Ship Harbor Nature Trail Parking Lot
Bass Harbor Head/Lighthouse Parking Lot
Long Pond Parking Lot
Bernard Mountain Hiking Trail Parking Lot
Seal Cove Pond Boat Ramp
Pretty Marsh Picnic Area
Hodgdon Road
Beach Mountain Parking Lot

8. Selection of park visitors to be interviewed will be randomized to the fullest extent possible.
9. Data to be collected during interviews with park visitors includes:
 - A. Length of stay
 - B. Persons per vehicle
 - C. Purpose of visit (classified as "recreation visit," "non-recreation visit," or "nonreportable visit") as described in the Statistical Office's Public Use Reporting Guidelines, Chapter 3, "Governing Concepts," Release No. 1.
 - D. Home town zip code
 - E. Sites visited within park
 - F. Route travelled through park, including entrance and exit locations
10. Data collected and analysis thereof will provide information enabling determination of the following:
 - A. Visitor count multiplication factors for automobile traffic counters located in the park.
 - B. Seasonal average length-of-stay multipliers for recreation day use visits, overnight stays, and nonrecreation visits.
 - C. Seasonal average number of persons-per-vehicle multipliers for recreation visits and nonrecreation visits.
 - D. Seasonal visitation proportions (as a percent of total visits) for recreation visits, nonrecreation visits, and nonreportable visits.
 - E. Seasonal duplicate counting reduction factors for recreation visits and nonrecreation visits.

Data will be reported to the Statistical Office in the following format:

- Item 1. Seasonal vehicle count multiplication factors.
- Summer season vehicle count multiplication factor for the vehicle counter at station 4701 - _____.
- Fall season vehicle count multiplication factor for the vehicle counter at station 4701 - _____.
- Winter season vehicle count multiplication factor for the vehicle counter at station 4701 - _____.
- Spring season vehicle count multiplication factor for the vehicle counter at station 4701 - _____.

Summer season vehicle count multiplication factor for the vehicle counter at station 4702 - _____

Fall season vehicle count multiplication factor for the vehicle counter at station 4702 - _____

Winter season vehicle count multiplication factor for the vehicle counter at station 4702 - _____

Spring season vehicle count multiplication factor for the vehicle counter at station 4702 - _____

Item 2. Length-of-Stay

Type of Use Seasons

	Summer Season	Fall Season	Winter Season	Spring Season
Recreation - Day Use				
Recreation - Overnight Use				
Nonrecreation Use				

Item 3. Persons-per-Vehicle

	Summer Season	Fall Season	Winter Season	Spring Season
Recreation Visits				
Nonrecreation Visits				

Item 4. Seasonal Visitation Proportions

	Summer Season	Fall Season	Winter Season	Spring Season
Recreation Visits				
Nonrecreation Visits				
Nonreportable Visits				
Total	100%	100%	100%	100%

Hot Springs National Park

PUBLIC USE COUNTING AND REPORTING INSTRUCTIONS

Following are detailed instructions for collecting and reporting data to be entered on Form 10-157, Revised, Monthly Public Use Report by Hot Springs National Park. These instructions are effective the date of issuance and will continue in effect unless changed by amendment or by memorandum from the Socio-Economic Studies Division to the superintendent approving a requested change.

Each item below describes the procedures to be followed in collecting public use data and summarizing the various elements of those data for entry on the corresponding line on the 10-157, Monthly Public Use Report.

Recreation Visits

1. An inductive loop counter is placed on the exit lane of Hot Springs Mountain. The traffic count is reduced for non-reportable vehicles (350 per month). The reduced traffic count is multiplied by the persons-per-vehicle (PPV) multiplier of 2.5.
2. An inductive loop counter is placed on the northbound (entrance) lane of West Mountain Summit Drive. The traffic count is reduced for non-reportable vehicles (250 per month). The reduced traffic count is multiplied by the PPV multiplier of 2.5.
3. An inductive loop counter is placed on the northbound lane of U.S. Highway 7S south of Gulpha Gorge Campgrounds. The traffic count is reduced for non-reportable vehicles (450 per month). The reduced traffic count is multiplied by 0.05 (May through October) or 0.01 (November through April) to determine recreation vehicles. The recreation vehicle count is multiplied by the PPV multiplier of 2.5.
4. An inductive loop counter is placed on the southbound lane of U.S. Highway 7S north of Gulpha Gorge Campgrounds. The traffic count is reduced for non-reportable vehicles (200 per month). The reduced traffic count is multiplied by 0.05 (May through October) or 0.01 (November through April) to determine recreation vehicles. The recreation vehicle count is multiplied by the PPV multiplier of 2.5.
5. Electric eye counters are located at the north and south end of the Bathhouse Row sidewalk. The counters are summed together and multiplied by 0.5 to adjust for visitors being counted twice.

6. Visitors using the thermal water jugs are estimated as 10,800 per month. This is calculated as 15 visitors per hour, times 3 fountains, times 8 hours, times 30 days. This number can be verified by a simple survey as needed.

7. The number of visitors using the Quapaw Bath and Spa.

Non-recreation Visits

1. An inductive loop counter is placed on the northbound (exit) lane of West Mountain Drive. The traffic count is reduced for non-reportable vehicles (250 per month) and recreation vehicles (50 percent of the traffic count on West Mountain Summit Drive). The reduced traffic count is multiplied by 0.65 to adjust for same day reentries. The adjusted traffic count is multiplied by the PPV multiplier of 1.5.

2. An inductive loop counter is placed on the southbound (exit) lane of West Mountain Drive. The traffic count is reduced for non-reportable vehicles (200 per month) and recreation vehicles (50 percent of the traffic count on West Mountain Summit Drive). The reduced traffic count is multiplied by 0.65 to adjust for same day reentries. The adjusted traffic count is multiplied by the PPV multiplier of 1.5.

3. An inductive loop counter is placed on the northbound lane of U.S. Highway 70 south of Gulpha Gorge Campgrounds. The traffic count is reduced for non-reportable vehicles (450 per month). The reduced traffic count is multiplied by 0.95 (May through October) or 0.99 (November through April) to determine non-recreation vehicles. The non-recreation vehicle count is multiplied by 0.65 to adjust for same day reentries. The adjusted traffic count is multiplied by the PPV multiplier of 1.5.

4. An inductive loop counter is placed on the southbound lane of U.S. Highway 70 north of Gulpha Gorge Campgrounds. The traffic count is reduced for non-reportable vehicles (200 per month). The reduced traffic count is multiplied by 0.95 (May through October) or 0.99 (November through April) to determine non-recreation vehicles. The non-recreation vehicle count is multiplied by 0.65 to adjust for same day reentries. The adjusted traffic count is multiplied by the PPV multiplier of 1.5.

Recreation Visitor Hours

The visitors at each location are multiplied by the length-of-stay multiplier for each location. The subtotal of each location is summed for total recreation visitor hours. See Table 1 for length-of-stays for each location.

Table 1
Recreation Use Visitor Hour Appendix

LOCATION	LENGTH-OF-STAY
Hot Springs Mountain (Summer) (May - October)	0.8 Hour
Hot Springs Mountain (Winter) (November - April)	0.4 Hour
West Mountain Summit Drive	0.5 Hour
Gulpha Gorge Highway	0.2 Hour
Thermal Jug Fountain	0.2 Hour
Quapaw Bath and Spa	2.0 Hours
Fordyce Bathhouse VC	0.2 Hour
Buckstaff Bathhouse	1.5 Hours
Bathhouse Row Sidewalk	0.5 Hour
Overnight Stays	20.0 Hours Per Overnight Stay

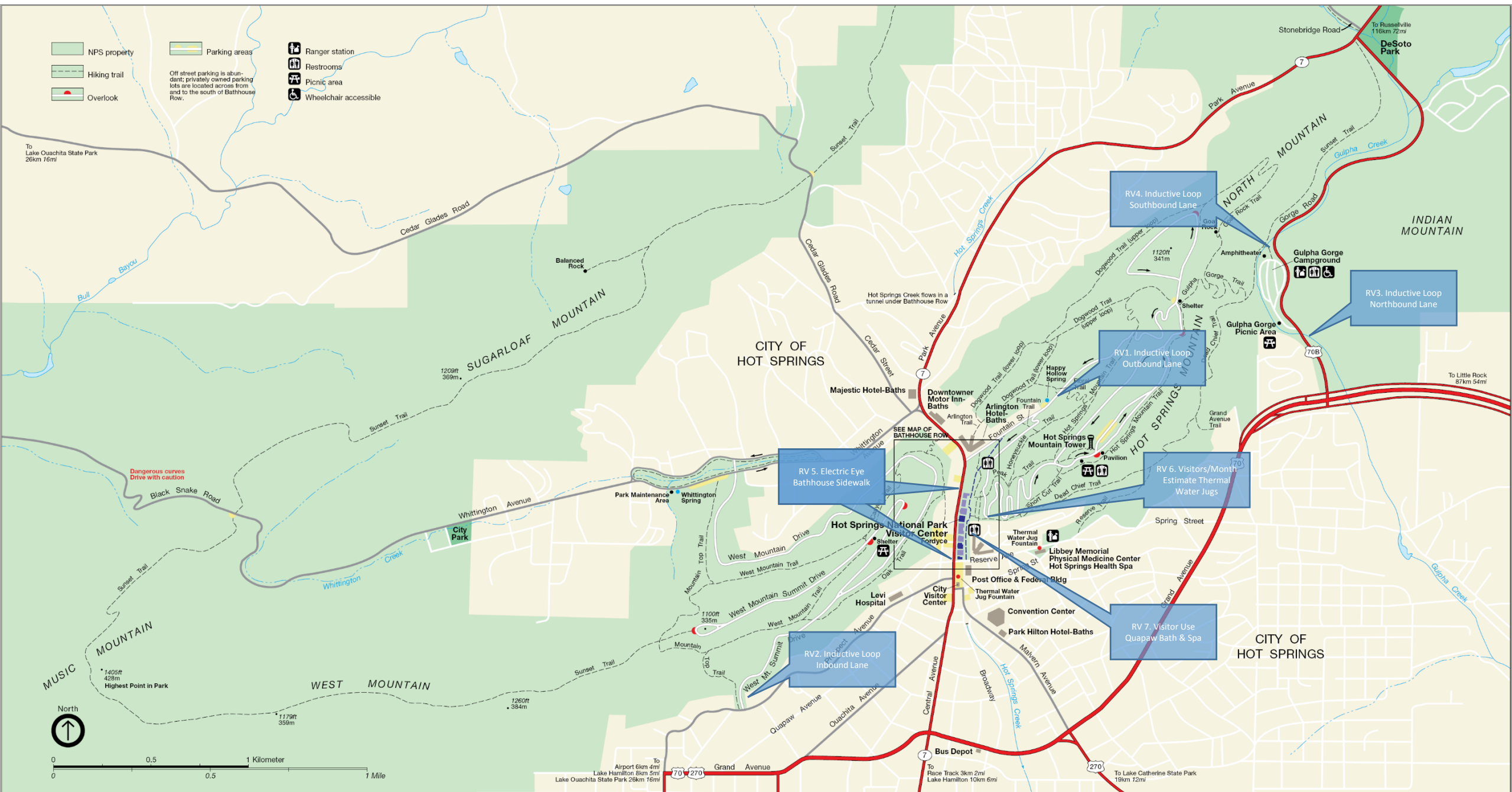
Non-recreation Visitor Hours

Non-recreation visits are multiplied by 12 minutes (0.2 hour).

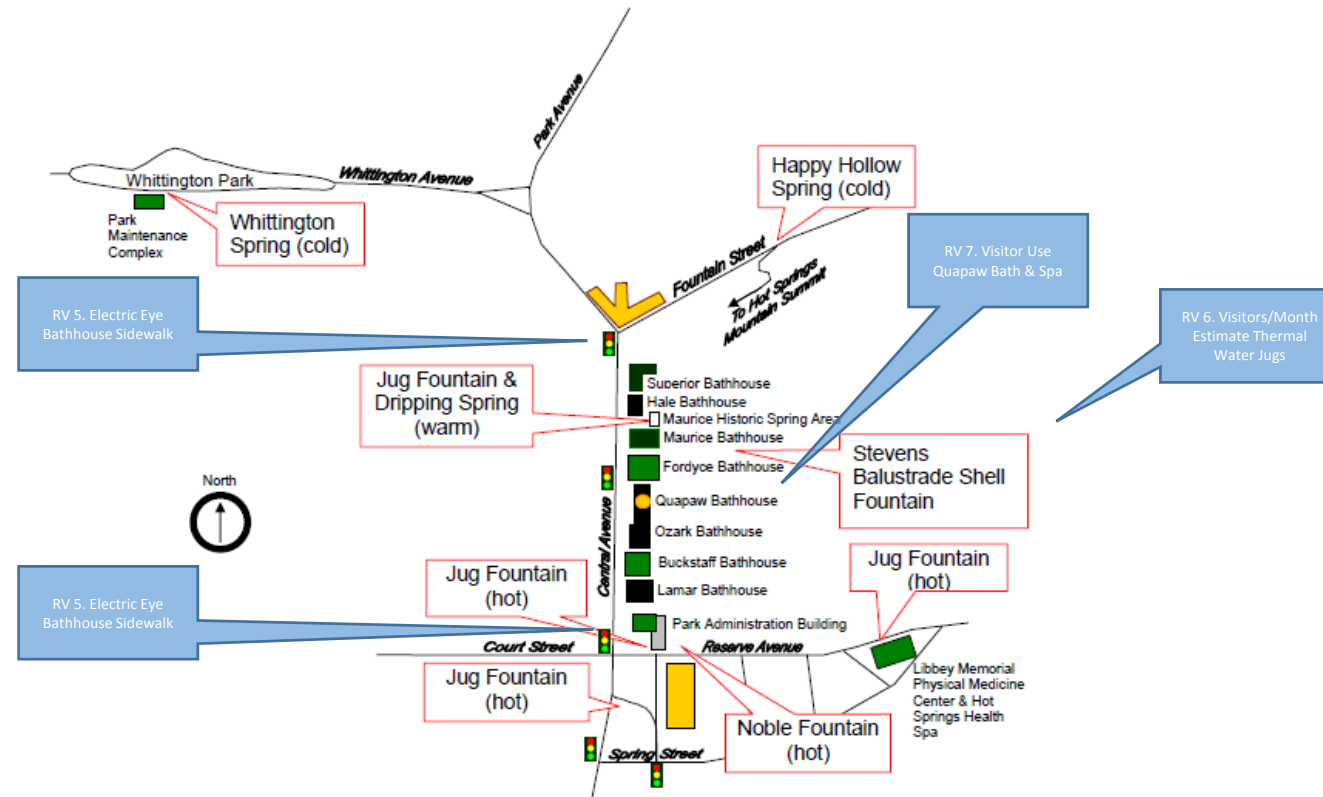
Overnight Stays

NPS Campgrounds - Gulpha Gorge GC

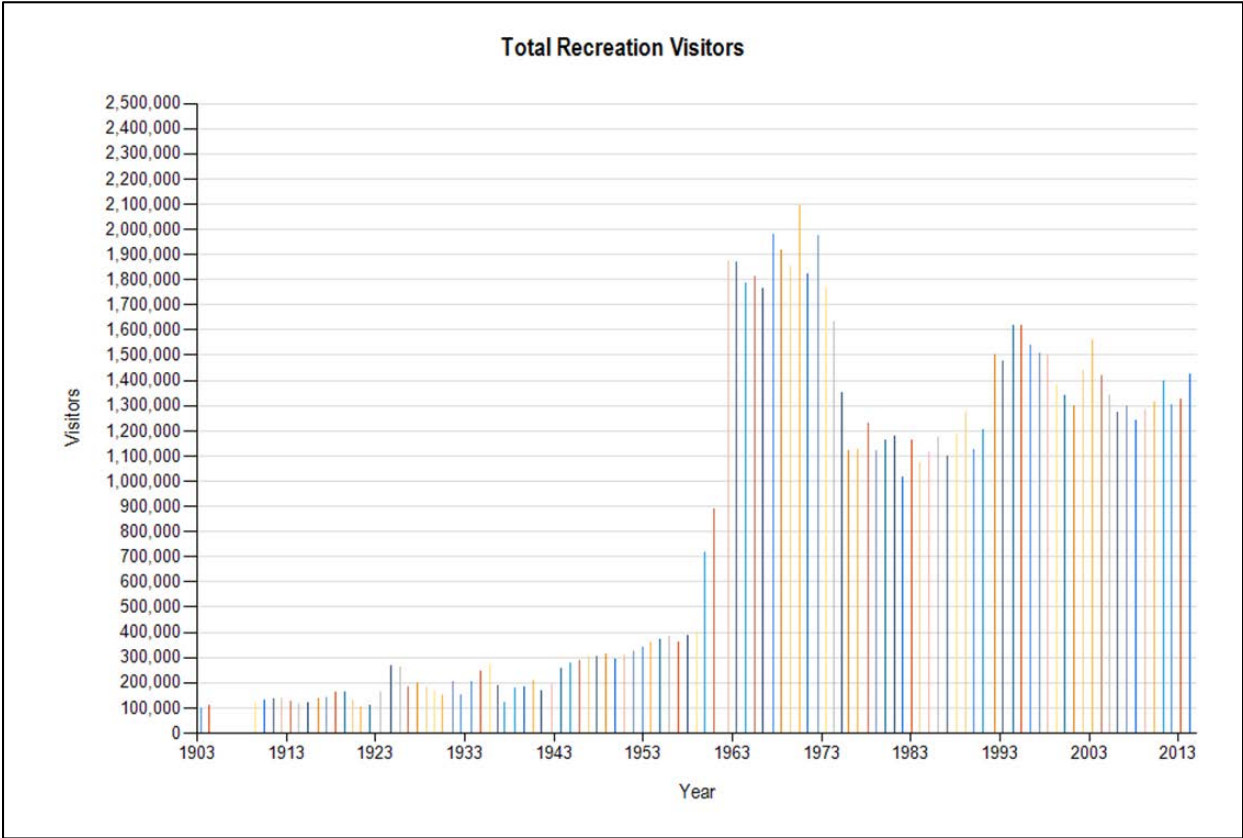
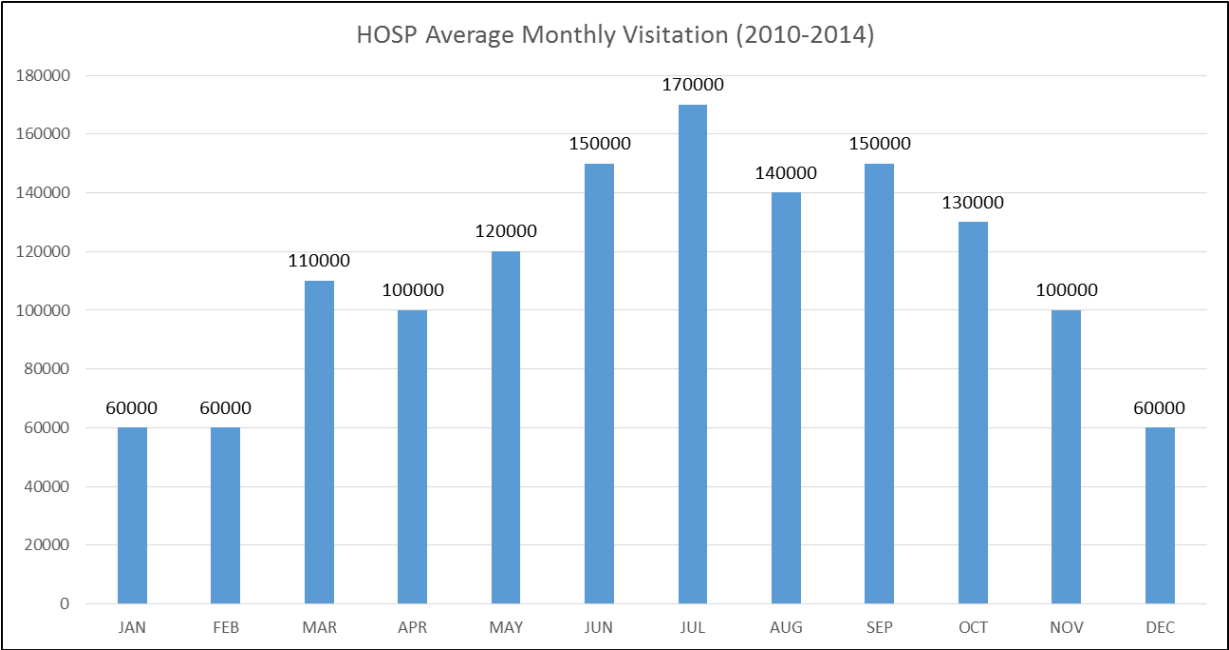
The number of visitors staying overnight in tent or RV sites.



Fountains Supplying Spring Water of Hot Springs National Park



HOSP Visitation Summary Statistics (Source: NPS Public Use Statistics Office)



APPENDIX B. HOSP COUNTING PROCEDURES HISTORY

Current HOSP visitor use counting and estimation procedures are the product of several revisions of a methodology originally implemented in 1992 or earlier. This document briefly reviews the history of procedure revision since 1992.

Counting Instruction Changes

Hot Springs National Park (HOSP)

1992 to 2005

- Removed the number of visitors taking treatments at Libbey Memorial Physical Medicine Center from recreation visits
- Removed recreation visitor hours for Libbey Memorial PMC
- Updated how counts are estimated for Gulpha Gorge campground from 'determining by permits issued' to 'estimating from Table 2'.
- Removed Libbey treatments from Special Use Data list

2005 to 2007

- Added number of visitors using Quapaw Bath and Spa to recreation visits
- Added Quapaw Bath and Spa recreation visitor hours
- Updated how counts are estimated for Gulpha Gorge campground from 'estimates from Table 2' to 'direct count of visitor overnights in tents or RVs'.
- Removed Special Use Data section

2007 to 2008

- Updated highway numbers in recreation visit text (70B to 7S)
- Updated highway numbers in non-recreation visit text (70B to 70)

APPENDIX C. DEFINITIONS FOR VISITOR USE ESTIMATION

PUSCRP estimates and reports visitor use according to specific criteria and in multiple categories, including recreational, non-recreational, and non-reportable visits. The following document presents technical definitions used by PUSCRP to estimate and report visitor use.

NPS Public Use Statistics Definitions

BACKCOUNTRY – One or more primitive or wilderness areas which are reached primarily by hiking, boating, or horseback.

CAMPGROUND – An area of land designated and developed for use as a camp.

CONCESSIONER – A private company or an individual granted the privilege of providing facilities and services considered necessary by the NPS for accommodating visitors.

CONCESSIONER CAMPGROUND – An element of a concessioner operation involving services for overnight camping.

CONCESSIONER LODGING – An element of a concessioner operation involving facilities for overnight lodging such as hotels, motels, cabins, cottages, trailer villages, and trailer rental.

MISCELLANEOUS OVERNIGHT STAY – Any overnight stay not otherwise defined (sleeping aboard boats, camping in organized groups, and/or any other overnight stays not included in other categories of overnight stays, except inholders, which are non-reportable).

NATIONAL PARK SERVICE (NPS) – A Department of the Interior (DOI) bureau which administers approximately two dozen types of federal land, nationally significant for their scenic, natural, scientific, historical, or archeological interest (see **CLASSIFICATION**). The agency was established as a Bureau of the DOI by an Act of Congress on August 25, 1916. The NPS does not administer National Forests (United States Department of Agriculture/Forest Service), Wildlife Refuges (United States Department of Interior/Fish and Wildlife Service), or a variety of other lands available for public use.

NON-RECREATION OVERNIGHT STAY – A *reportable* non-recreation overnight stay includes leaseholders, line shacks for ranchers, and government personnel (other than NPS employees).

NON-RECREATION VISIT – A *reportable* non-recreation visit includes:

- Persons going to and from inholdings across significant parts of park land;
- Commuter and other through traffic;
- Trades-people with business in the park;
- Any civilian activity a part of or incidental to the pursuit of a gainful occupation (e.g., guides);
- Government personnel (other than NPS employees) with business in the park;
- Citizens using NPS buildings for civic or local government business, or attending public hearings;
- Outside research activities (visits and overnights) if independent of NPS legislated interests (e.g. meteorological research).

NON-REPORTABLE VISIT – The entry into a park by NPS employees, their families, concessionaire employees, members of cooperating associations, NPS contractors, and service personnel are *not reportable* for public use. Specific situations include:

- Employees of the NPS who are assigned to the park or are visiting the park in connection with their duty assignment;
- NPS contractors, concessionaires, cooperating associations and their employees;
- Temporary or permanent members in household of personnel otherwise included in this definition whose residence is in the park;
- Private tenants within the NPS boundaries (inholders) if not crossing significant NPS territory for access;
- Persons engaged in pursuit of specific legal rights of use (e.g., subsistence hunting and fishing);
- Any other persons whose presence in the park is to help the Service fulfill its mission (e.g., volunteers in the park, research activities associated with the NPS mission).

OVERNIGHT STAY – One night within a park by a visitor. For example, three visitors for two nights yields 6 overnight stays.

RECREATION VEHICLE – Any enclosed vehicle used for camping which is more elaborate than a simple truck or car, such as pickup truck with camper body, pop-up tent trailer, travel trailer, bus, motor coach, mobile home, etc.

RECREATION VISIT – The entry of a person onto lands or waters administered by the NPS for recreational purposes, excluding government personnel, through traffic (commuters), tradespeople, and people residing within park boundaries. Visits originating on surface vehicles (trains, boats, other) and aircraft may be counted if they stop and disembark passengers on NPS administered territory. **The applicable rule is that one entrance per individual per day is countable.**

RV OVERNIGHT STAY – One night within a park by a visitor in an RV in an NPS-owned campground.

TANDEM VISITATION – A visitor going from park to park in one day. Visits to different parks are counted separately as long as the areas visited are independently authorized units of the National Park System, not separate portions of the same unit.

TENT OVERNIGHT STAY – One night within a park by a visitor in a tent in an NPS-owned campground.

VISIT - The entry of any person, except NPS and service personnel, onto lands or waters administered by the NPS. A visit may occur as a recreation visit or a non-recreation visit. A same-day reentry, negligible transit, and an entry to a detached portion of the same park on the same day are considered to be a single visit. Such adjustments are made insofar as practicable for noncontiguous parts of the same park. However, visits are reported separately for two contiguous parks.

VISITOR DAY - Twelve visitor hours in a park.

VISITOR HOUR - The presence of one or more persons, excluding NPS personnel, in a park for continuous, intermittent, or simultaneous periods of time aggregating one hour (e.g., one person for one hour, two persons for one-half hour).

APPENDIX D. ELEMENTS OF CURRENT VISITOR USE COUNTING AND ESTIMATION PROCEDURES FOR HOSP

Multiple data sources, fixed values, correction factors, and functions are used to count and estimate visitor use at HOSP. The following documents provide a key for understanding visitor use counting and estimation elements and processes. Each count, fixed value, and correction factor is labeled with the alphanumeric codes used in Section 3.3 |. There are five items included in this appendix:

- **Preview for Hot Springs NP (HOSP):** the PUSCRP input screen for HOSP. This item lists all current and know historic counts used to estimate visitor use at HOSP
- **Current elements of HOSP count system:** the counts, fixed values, and correction factors used in the current visitor use estimation procedures
- **REC calculation:** the elements and processes used to estimate recreational visits
- **NREC calculation:** the elements and processes used to estimate non-recreational visits
- **Map:** a map depicting visitor use count locations in HOSP

Preview for Hot Springs NP (HOSP)

Period: September, 2015

ENTER THE TRAFFIC COUNT AT HOT SPRINGS MOUNTAIN

A

TRAFFIC COUNT AT WEST MOUNTAIN SUMMIT DRIVE (NORTHBOUND)

B

North

South

ENTER THE TRAFFIC COUNT AT WEST MOUNTAIN DRIVE

C

D

ENTER THE TRAFFIC COUNT AT GULPHA GORGE HIGHWAY

E

F

ENTER THE # OF VISITORS AT FORDYCE BATHHOUSE VISITOR CENTER

G

OF VISITORS AT MUSEUM OF CONTEMPORARY ART

H

OF SPECIAL USE VISITORS

I

North

South

ENTER TRAIL COUNTS AT THE PROMENADE

J

K

Bathhouse

Massages

NUMBER OF VISITORS TO BUCKSTAFF BATHHOUSE

L

M

Pool

Massages

OF POOL USERS & MASSAGE/FACIALS AT QUAPAW BATH & SPA

N

P

North

South

ENTER ELECTRIC EYE COUNTS AT BATHHOUSE ROW

P

Q

Tents

RV's

OF TENT/RV OVERNIGHT STAYS AT GULPHA CG

R

S

ENTER THE NUMBER OF VISITORS AT MOUNTAIN TOWER

T

ENTER THE NUMBER OF BUSES

U

Current elements of HOSP count system

Equipment

- A • Inductive loop counter on exit lane of Hot Springs Mountain
- B • Inductive loop counter on northbound (entrance) lane of West Mountain Summit Drive
- C • Inductive loop counter on northbound (entrance) lane of West Mountain Drive
- D • Inductive loop counter on southbound (exit) lane of West Mountain Drive
- E • Inductive loop counter on northbound lane of US Highway 7S (or 70?) south of Gulpha Gorge Campground
- F • Inductive loop counter on southbound lane of US Highway 7S (or 70?) north of Gulpha Gorge Campground
- P • Electric eye counter on north end of Bathhouse Row sidewalk
- Q • Electric eye counter on south end of Bathhouse Row sidewalk
- G • Door counter at Fordyce Visitor Center (?)
- J • Trail counter on Promenade North
- K • Trail counter on Promenade South

Fixed Values

- X1 • Non-reportable vehicles subtracted from Hot Springs Mountain traffic count: 350/month
- X2 • Non-reportable vehicles subtracted from NB West Mountain Summit Drive traffic count: 250/month
- X3 • Non-reportable vehicles subtracted from NB West Mountain Drive traffic count: 250/month
- X4 • Non-reportable vehicles subtracted from SB West Mountain Drive traffic count: 200/month
- X5 • Non-reportable vehicles subtracted from NB Hwy 7S traffic count: 450/month
- X6 • Non-reportable vehicles subtracted from SB Hwy 7S traffic count: 200/month
- X7 • 10,800 visitors/month using thermal water jugs

Multipliers – traffic and trail counters

- X8 • 2.5 persons per vehicle for recreation vehicles
- X9 • 1.5 persons per vehicle for non-recreation vehicles
- X10 • Recreation vehicles are 5% of NB and SB Highway 7S traffic counts (May through October)
- X11 • Recreation vehicles are 1% of NB and SB Highway 7S traffic counts (November through April)
- X12 • Non-Recreation vehicles are 95% of NB and SB Highway 7S traffic counts (May through October)
- X13 • Non-Recreation vehicles are 99% of NB and SB Highway 7S traffic counts (November through April)
- X14 • 50% of West Mountain Summit traffic count is subtracted from West Mountain entry and exit traffic counts to remove recreation traffic from the non-recreation traffic counts
- X15 • All reduced non-recreation counts are multiplied by 0.65 to account for same day reentries
- X16 • Bathhouse row electric eye counts are summed and divided by 2 to account for entry/exit

Multipliers – Length of Stay

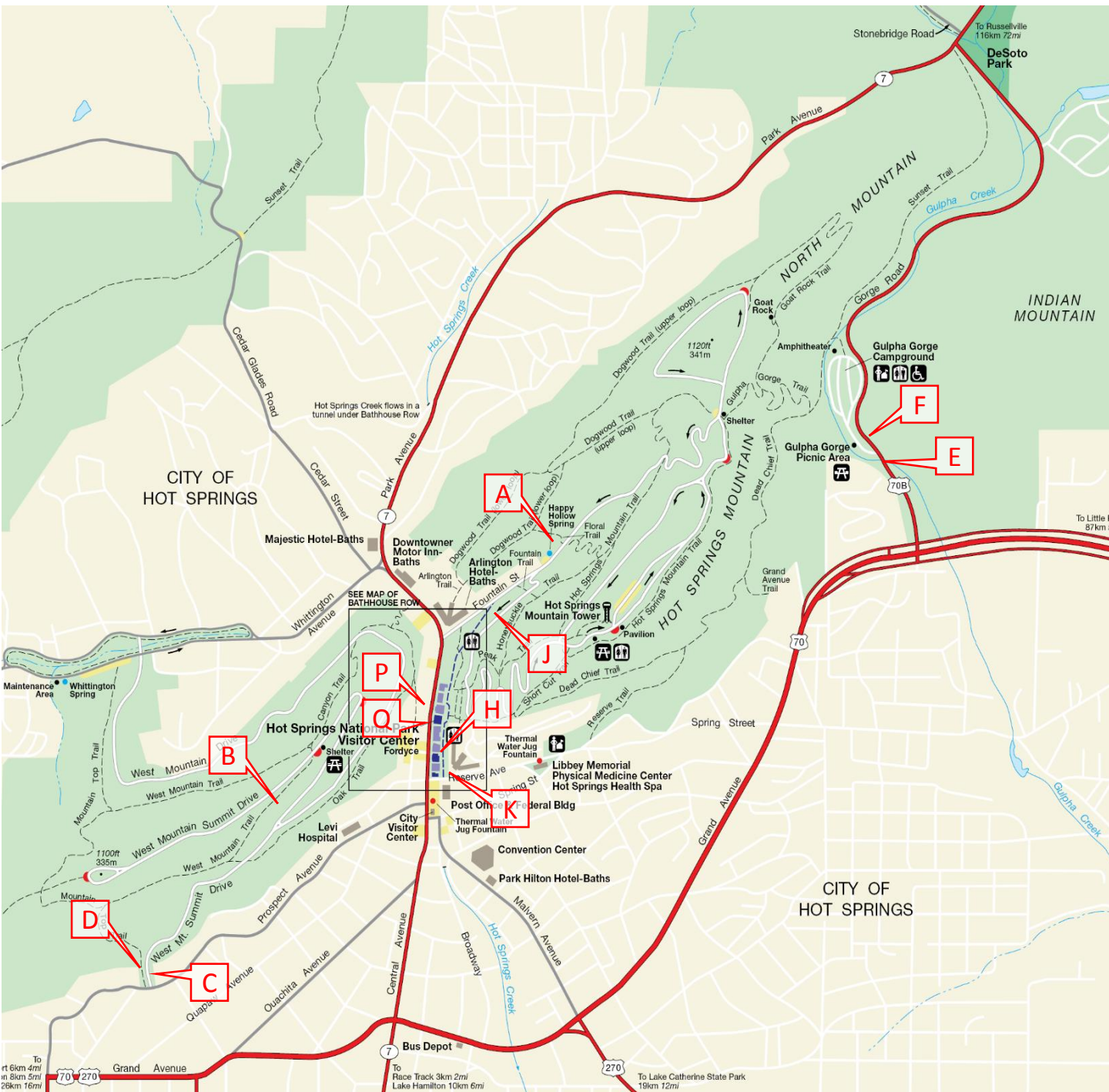
- X17 • See Table 1 in counting instructions for recreation visit hour multipliers
- X18 • Non-recreation visits are multiplied by 12 minutes (0.2 hours)

Input Field	Value	Calculation Field	Value	Calculation Field	Value
Month	7				
Traffic Count at Hot Springs Mountain - F1	A 7,479	Hot Springs Mountain Visitors - F20	17,823 Y1		
Traffic Count at West Mountain Summit Drive (North) - F2	C 9,566	Summit Drive Visitors - F22	23,290 Y2		
Traffic Count on Gulpha Gorge Hwy (North) - F5	E 16,340	Gulpha Hwy N & S Visitors - F26	12,664 Y3		
Traffic Count on Gulpha Gorge Hwy (South) - F6	F 85,621				
Visitors at Libbey Mem Phys Med Center (no longer used) - F9		Libbey Center Visitors - F34			
Electric Eye Count at Bathhouse Row (North) - F10	P 35,126	Bathhouse Row Visitors - F36	36,001 Y4	REC	104,544
Electric Eye Count at Bathhouse Row (South) - F11	Q 36,876				
		Rec - Thermal Jug Fountain - F40	10,800 Y5		
Museum of Contemporary Art Visitors - F18	H 550				
Special Use Visitors - F19	I 168				
Trail Count Promenade North - F46	J 2,854	Visitors on Promenade - F48	3,249 Y6		
Trail Count Promenade South - F47	K 3,644				

REC

Input Field	Value	Calculation Field	Value	Calculation Field	Value
Month	7				
Traffic Count at West Mountain Summit Drive (North) - F2	B 12,370				
Traffic Count at West Mountain Drive (North) - F3	C 12,482	Non-Rec Use - F24	19,474 Y7	NREC	170,708
Traffic Count at West Mountain Drive (South) - F4	D 20,311				
Traffic Count on Gulpha Gorge Hwy (North) - F5	E 81,006				
Traffic Count on Gulpha Gorge Hwy (South) - F6	F 82,920	Non-Rec Gulpha Hwy - F27	151,234 Y8		

NREC



APPENDIX E. EXAMPLE SPECIAL USE PERMIT DATA

Special use permitted events are required to report to HOSP the number of visitors anticipated to participate in the events, which are then reported to PUSCRP for inclusion in visitor use estimates.

Spa Pacers- 2014: 500 participants
2015: 700+ participants

Levi Hospital: 2014: 150 participants
2015: 150 participants

Concert Band: 2014: 600-800 participants- **8 concerts a summer**
2015: 1000 participants- **8 concerts a summer**

Wild Boar Ride: 2014: 400 participants
2015: 400 participants (newspaper reported record breaking attendance at 3,000)

Corvette Parade: 2014: 300 cars
2015: 400 cars