Exploring the Social Effects of Increased Hiker Use at the Northern Terminus of the Appalachian Trail

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EXPLORING THE SOCIAL EFFECTS OF INCREASED HIKER USE AT THE NORTHERN TERMINUS OF THE APPALACHIAN TRAIL

By

Leah Beck

B.S. Iowa State University, 2014

A THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science (in Forest Resources)

The Graduate School
The University of Maine

May 2019

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EXPLORING THE SOCIAL EFFECTS OF INCREASED HIKER USE AT THE NORTHERN TERMINUS OF THE APPALACHIAN TRAIL

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Thesis Advisor: Dr. John Daigle

An Abstract of the Thesis Presented in Partial Fulfillment of the Requirements for the Degree of Master of Science (in Forest Resources) May 2020

The increase of tourism and outdoor recreation popularity has produced a field of research revolved around the social and environmental impacts of visitors. Past research has shown that understanding visitor use and behavior is essential for influencing management strategies. This study focused on understanding the crowding perceptions and experiences of hikers who summit Maine’s tallest mountain, Mount Katahdin. Katahdin is designated as the northern terminus of the Appalachian Trail (AT) which has seen a notable increase in use from long distance hikers in the last 25 years. Increased long-distance AT hikers, and documented issues with hiker behavior in Baxter State Park (BSP) Maine has lead park officials to implement a permitting system in order to monitor hikers and limit their numbers annually. Park officials stated that this permitting system will address potential crowding issues on the summit of Mount Katahdin and mitigate further biophysical impacts to the trail. This study used survey methods to investigate the social impacts of current populations climbing Mount Katahdin and their summit condition preferences in order to inform future management decisions. Appalachian Trail long-distance hikers, an understudied yet growing population, were featured to gain a better understanding of their perspectives, preferences, and experiences. During the summer and fall of
2017 researchers surveyed hikers at two different locations to gather information from within Park boundaries and on a neighboring property. Specific inquiries about crowding on Mount Katahdin showed that the current population of hikers do not necessarily feel crowded but could feel crowded if use continues to increase.
ACKNOWLEDGEMENTS

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CHAPTER 1

A VISUAL APPROACH TO GATHER BASELINE VISITOR EVALUATIONS OF SOCIAL CONDITIONS ON THE SUMMIT OF MOUNT KATAHDIN, MAINE

1. INTRODUCTION

As popularity of tourism and recreation in natural areas continue to increase, the push for further research surrounding social and biophysical concerns associated with human impact follows suit (Newsome et al., 2013). On the social end of the spectrum, issues of crowding, congestion, conflict, behavior, and general visitor preferences are of interest because understanding visitor experiences can aid in communication and education efforts, as well as inform management decisions and policy making (Manning et al., 1999; Manning et al., 2001). The Appalachian National Scenic Trail (AT), a 2,184-mile pedestrian recreational path designated as a National Scenic Trail, passes through 14 different states and winds up and down hundreds of thousands of feet in elevation from Springer Mountain, Georgia to Mount Katahdin, Maine. At this point, over 3 million people hike at least a portion of the trail each year.

Figure 1. Number of AT hikers per year in Baxter State Park. The graph shows a general upward trend with potentially notable increases after the red dots at 1998 and 2012; which are the years that the books “A Walk in the Woods” by Bill Bryson and “Wild” by Cheryl Strayed were released respectively. Another big leap occurred after 2015, the year the film adaptation of “Wild” premiered.
year and, in 2017, over 2,000 traversed the entire trail in under 12 months (Appalachian Trail Conservancy: Explore the Trail, 2017). These long-distance hikers have the option to hike northbound (Nobo), southbound (Sobo), or alternatively thru-hike; for example flip-floppers (Flip-flop) can start in the middle of the trail at two different phases and hike outward. Some AT visitors, called section hikers, choose to hike a portion of the trail on overnight trips of varying lengths. Long-distance hikers were no exception to notable increases, shown in Figure 1, as their total numbers increased from 1,426 to 2,733 (passing through the northern terminus) from 2010 to 2016 respectively, (Baxter State Park, 2016). In Baxter State Park (BSP), at the northern terminus of the trail, managers are noting the effects of increased long-distance hiker use of the AT. On the environmental side, an increased number of any type of hiker has the potential to negatively impact Mount Katahdin’s fragile alpine landscape in the form of trampling or waste, but BSP personnel have expressed concern with both social and environmental impacts perceivably caused by the additional thru-hikers (Baxter State Park, 2014).

1.2 Research Setting

1.2.1 BSP Management Structure

Between 1931 and 1963 Governor of Maine Percival Baxter acquired and gifted 28 parcels of land to the State of Maine; which would later be designated Baxter State Park. Along with the physical land donation, Governor Baxter set up a monetary trust that would prevent Park managers from having to compete for Maine tax dollars and would allow funds to be used to keep the park “forever in the natural wild state” (About the Park, Baxter State Park, 2018). A corresponding document called the Deeds of the Trust outlined BSP’s government structure and land use management specifics for the Park. The governing authority, specified by Governor
Baxter, is composed of the Commissioner of Maine Inland Fisheries and Wildlife, the Director of the Maine State Forest Service, and the Attorney General. Authority members cooperatively make decisions for the Park using their collective knowledge, power, and experiences with the on-the-ground guidance of the Park Director. In this way the Park is tied to the state government of Maine but BSP does not identify or associate with the Maine State Park system, despite its name. There are numerous guidelines set out by Governor Baxter for the Authority to follow with the first two reading: (1) To protect the natural resources of the Park for their intrinsic value and for the enjoyment of present and future generations; and (2) To provide various appropriate recreational opportunities to Park visitors (About the Park, Baxter State Park, 2018). These two statements were used by former Park Director Jensen Bissell in a public letter in 2014 to the Appalachian Trail Conservancy, detailed in section 1.3.1, outlining concerns over the increase in Appalachian Trail thru-hiker behavior and number increase in the Park (Baxter State Park, 2014).

1.2.2 AT Past and Present in the Park

The AT and BSP have overlapped since 1933 when Myron Avery designated Katahdin as the northern terminus of the trail. BSP has since recognized the designation; however, the Park maintains full control over the AT corridor within its boundaries. The majority of the AT corridor is owned and maintained by the National Park Service and their sub-unit the Appalachian Trail Conservancy. This discrepancy allows BSP to make un-supervised management decisions regarding AT hikers and trail maintenance. Using the Trust goals as a reference, BSP has made numerous management choices in the past 25 years regarding the trail. Daily limitations on Mount Katahdin’s use have been in place since the 1990s using parking lot
size as the threshold (Besides AT hikers, only visitors who have a parking space or are camping the night before their hike are allowed to hike Katahdin on any given day). Many management actions specifically targeted the AT population passing through the Park; some of which were entirely for the benefit of the hikers (shuttle service), others were to protect resources using the guidance of the Trust’s primary goals (permit monitoring system). The construction of the Birches Campsite was a major action in 2007 to create a designated camping area, away from other overnight visitors and at a lower cost of $10 instead of the normal $32.

The first official AT Hiker Permit system by BSP was initiated in 2016. Hikers were required to obtain an AT Hiker Permit Card but did not risk any consequences for non-compliance. During the 2016 season an unlimited amount of hikers were able to acquire permit cards on both a daily and yearly basis. In 2017 BSP introduced a new iteration of the permitting system, which annually capped available permit cards at 3,150, but hiker counts did not exceed the limit. All AT long-distance hikers (Nobo, Sobo, Section, and Flip-Flop) were required to pick up a free permit card and have them stamped by Park staff prior to hiking from the base of Katahdin to the summit. A hiker can obtain a permit one of three ways: (1) Stop at Katahdin Stream Ranger Station (trailhead to the AT up Katahdin); (2) Stop at the Togue Pond automobile entrance on the south end of the Park or; (3) Stop at BSP Headquarters in Millinocket, 18 miles from the southern border of the Park. For NOBO hikers options (1) and (2) are obsolete unless they can acquire a ride to either location or walk many miles out of their way. Consequences for any hiker found without a permit include a mandatory court summons and/or a $200 fine. The stipulations and limits applied to this permitting system are what make it unique to other types of permits on the AT. These were created as a result of current issues documented by the Park in order to prevent future problems.
1.3 Current and Future Issues

In November of 2014 Park Director Jensen Bissell, with the support of the Baxter State Park Authority, released a public letter about AT hiker presence in the Park addressed to Wendy Jansen (the Superintendent of the Appalachian National Scenic Trail) and Ron Tipton (Director of the Appalachian Trail Conservancy). In the letter Bissell described the AT’s relationship with BSP starting with one of the first thru-hikers, Earl Schaffer, in the 1940s all the way up to the AT’s current status within Park boundaries. Bissell also discusses the amenities, facilities, and services offered by the Park to thru-hikers (Section 1.2.2). The body of the letter was arguably the most controversial as it zeroed in on “Current Issues”. Many of the issues are linked to overuse of the Parks resources and can create problems for BSP related to budget distribution, daily staff effort, signage and facilities, and radio traffic time. The Park accuses AT hikers of traveling in large groups, disregarding Park regulations, and publicly using of alcohol; which provided a basis to study the social impacts of increased use of the trail.

Table 1. A Brewing Conflict. Shown below is a summarized list of the current issues listed by BSP in a letter (Appendix C), and the management strategies being used to manage the AT population in the Park. The 2017 visitor use survey implemented in this project is the latest directive used to try and assess patterns in visitor behavior and preferences.

<table>
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<th>Mitigation and visitor management strategies in BSP</th>
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<td>Special thru-hiker campsite</td>
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<td>Traveling in large numbers</td>
<td>Coordination with local shuttles</td>
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Without management action there are a number of future issues that could develop from the social conditions created by current increased visitor use. Perceived overuse of the summit may result in negative evaluations from visitors which, in turn, can prevent visitors from returning to the Park in the future. Plus, though second in priority, BSP would not be attaining their goal of providing quality visitor experiences. Additionally, if increases continue, problematic behavior has the potential to negatively impact other visitors. Both biophysical and social conditions are fragile on the summit of Mount Katahdin, but taking a management action is a difficult task.

Managing a section of a long-distance hiking trail and taking action to address the aforementioned issues presents a variety of challenges. First, there are thousands of access points along the Appalachian Trail. Hikers can get on and off the path in towns, road crossings, or trail intersections making it difficult to apply cohesive management strategies that transcend the length of the trail. It is for this reason that state, federal, and private landowners implement their own rules and regulations. Often times hikers will walk through multiple types of land ownership in a single day and it is up to managers to make information available to hikers and for hikers to find that information. The new AT long-distance hiker permit system is not the only permit that hikers need to acquire on their long journey, but it is the only part of the trail that applies potential use limits in the future to long-distance hikers.

1.4 Literature Review

1.4.1 Defining the quality of visitor experience.
Defining the parameters of a high quality visitor experience is complex because, by nature, so is the experience itself. A visitor’s experience while recreating in a park or natural area begins before they arrive during the planning process and ends long after they leave when they reflect on their trip. This lengthy process contains many moments which may impact a person’s overall evaluation of a trip. Small moments can have an disproportionate influence on whether or not a visitor perceives an experience to be positive or negative and a visitor’s overall evaluation can also be influenced by an accumulation of smaller assessments on various points in a visitor’s trip (McIntyre & Roggenbuck 1998; Borrie & Roggenbuck 2001). Researchers investigate these moments and influential factors by asking visitors to rank their acceptance of certain conditions to assess current management efforts. They also ask visitors about their preferred conditions to expose areas for improvement and to create a target for desirable experiences so that overall management goals may be achieved (van Riper et al., 2011). After determining the cumulative aspect of a visitors experiential assessment, researchers began to focus on what factors can negatively or positively impact it. Three aspects of a recreation experience have been determined as important influential factors: the biophysical environment, managerial actions, and social conditions. Recreationalists all have pre-determined ideals about what the natural environment will looks like and the condition of visitor use areas, so when those ideals are not met it may negatively impact visitor experiences. For example, Cole and Hall showed in a 2009 study that seeing litter and many heavily impacted campsites detracts from visitor experiences (Cole and Hall, 2009). A negative visitor experience rating may also come as a result of managerial actions that do not necessarily align with visitor preferences. At a small campground along the Appalachian Trail Daniels and Marion asked visitors to rate their overall experience satisfaction before and after managers cut back vegetation and created hillside
campsites. Their results showed that the managerial action had a net benefit for visitors because they ranked all attributes of the experience higher after the campsites were created (Daniels and Marion 2006).

Similar to the impacts of environmental degradation, a undesirable social experience can lead to negative experiential evaluations. Recreationalists may have preferences for the amount of people they interact with, the type of recreationalists they interact with (ex. hikers and mountain bikers), or the behavior of other visitors. If any of these variables do not align with a visitor preference it may, once again, have the outcome of a negative evaluation. The most prominent social condition observed in studies of visitor experience is crowding, or when a recreationalists interacts with more people than they find acceptable.

1.4.2 Summit Conditions and Norms: A Visual Approach

The perception of crowding is one of the most intensely studied topics in outdoor recreation research (Manning, 1999; 2007). This is predominantly due to the idea that visitor perceptions do not always reflect management observations and, to make more informed decisions, managers can attempt to understand what a visitor is experiencing. Over many decades of research recreational scientists have attempted to bridge the gap between these two groups. The most commonly used tool is the social carrying capacity. Social carrying capacities are a subjective indicator for the maximum number of people that an area can hold before social experiences are compromised (Wagar, 1964; Lucas b, 1964; Manning, 1999). A widely understood issue associated with social carrying capacities is crowding. Crowding is a subjective and normative concept that occurs when an individual perceives a user density as negative. Crowding perceptions can also be exacerbated by the type of behavior or use type
happening in the area, especially if they are not aligned with recreational visitor norms.

Recreation norms can be defined as standards that groups apply to environmental and social conditions like the acceptable number of people seen on a trail per hour (Manning, 2000).

Managers can use visitor norms to create standards of quality or a targeted point within a range of acceptable norms determined by social and ecological monitoring (Manning, 2001).

Using surveys or other visitor interaction methods managers and scientists can begin to identify what norms and variables are associated with the quality of their visitor’s experiences, including the preferred number of other recreationalists in a particular area. Measuring summit condition perceptions is challenging because of its subjective nature and at first recreationalists were simply asked if they were bothered by the number of people they saw (Stankey, 1973).

After the development/discovery of norm theories ranges of acceptability could be assembled using a visual and non-visual methods (Manning, 2001). Researchers then learned that situational variables and user characteristics can influence norms, which lead to a separation among user groups during analyses (Cole & Hall, 2012). For example, in a White Mountain National Forest survey researchers noticed a significant difference among social conditions preferences between those visiting on the weekend and those visiting on weekdays (White Mountain National Forest Report, 2018). Discovering discrepancies amid user groups helps managers understand what is expected and preferred by different types of visitors which can lead to adaptive management and targeted education efforts. In recent years a visual approach has emerged as a useful tool. Instead of asking visitors to identify how many people they saw and whether they felt crowded, researchers can show a series of photos representing different social scenarios. Using photos provides more realistic depictions of use levels and removes the need for visitors to remember an arbitrary, potentially biased number. Moreover, researchers can
depict a particular setting such as an open area on the summit, a trail corridor, or a parking lot; each of which could differ in preferred conditions. By examining the crowding perceptions of a unique population, that is already limited, and by using a visual approach this study explores many previously understudied topics in outdoor recreation research. Overall, this study aimed to address social concerns by exploring the experiences of all types of hikers on the trail and summit of Mount Katahdin. Specifically, crowding perceptions and summit condition preferences, trail congestion, the behavioral impacts of other hikers, and differences among descriptive variables were considered.

1.4.3 Experience Use History

In addition to sociodemographic variables, Experience Use History (EUH) is a widely studied predictor for crowding perceptions. Every recreational activity includes participants with a spectrum of experience level. For example, for some kayakers paddling a flat lake is the most intense water they’ve encountered while others consistently paddle challenging rapids. Due to the differing experience levels these two paddlers would likely approach, perceive, and assess the same paddling trip differently. The frequency of use has also been noted as an important influencing factor for perception, attitudes, and assessments. It has been noted that highly experienced recreationalists attach more emotion and loyalty to a certain area or activity which can affect their perceptions of social and environmental conditions (White et al., 2008). A combination of the level of experience and the frequency of use variables has been referred to as Experience Use History or EUH, (Hammitt et al., 1984; Hammitt et al., 2004; Hammitt et al., 2009).
Studies of EUH have investigated its relationship with perceptions of crowding, attitudes towards management decisions, and preferences to determine how recreationalists on along the EUH scale respond. Chipman and Helfrich discovered that more experienced anglers are likely to approve of stricter harvest regulations. Another study found that campers prefer more primitive campsites when they have visited the location before (McFarlane, 2004). Eder and Arnberger explored the impacts of EUH on social perceptions and found that more experienced resulted in higher crowding perceptions during weekday visits (Eder and Arnberger, 2012). This study furthered investigated the impacts of EUH by imploring a varied population including understudied and extremely experienced recreationalists, long-distance Appalachian Trail hikers.

1.4.4 Appalachian Trail Hikers

Research on the Appalachian Trail has traditionally concentrated on ecological impacts of recreation with other studies focusing on place attachment and social phenomena on the trail. Some studies have taken an anthropological approach to understand hiking culture and hiker motivations. In terms of peer reviewed literature, studies about or located on the AT are limited. Littlefield & Siudzinski (2012) found that equipment status and identity play a role in the social organization of serious leisure activity communities like AT thru-hiking. Researchers who focused on place attachment and behavioral loyalty on the AT determined that more committed recreationalists are more attached and generally more loyal suggesting that thru hikers are the most committed recreationalists on the trail because of their dedication and the seriousness of their leisure activity (Kyle et al., 2003). Another study by Daniels and Marion (2006) explored AT user perceptions of campsites at a high use site. Participants were surveyed before and after various management actions as a pilot for further decisions using the efficacy of visitor
perceptions. The most comprehensive study concerning AT users and the most useful for this research was conducted by Robert Manning in 2000 titled “Use and Users of the Appalachian Trail: A Geographic Study”. The goals of this research were to identify user groups and their characteristics and preferences in order to inform management agencies along the AT. Some problems reported by participants included moderate crowding (more so in Northern regions than Southern regions), lack of facilities (more so in Southern Regions than Northern regions) and “too much management”. The last reported issue is of particular interest to this research because respondents participating from Northern regions perceived this issue at a higher intensity and among groups, thru hikers felt this to be more of a problem than other groups. The highest rated issue was ecological impacts and damage to the trail corridor; which was also perceived to be more of a problem by northern region participants than southern.

1.5 Study Purpose and Objectives

This study was created in conjunction with Baxter State Park staff to address concerns of the social impacts of a growing AT long-distance hiker population. Objectives reflect both management and research needs.

Objectives:

1. Create a profile of visitor use and user characteristics of AT hikers and day hikers using the Hunt Trail to access the summit of Mount Katahdin.

2. Gather baseline evaluations of social conditions on the trail and summit of Katahdin.

3. Explore visitor use and user characteristics that may influence the evaluation of social conditions and quality of visitor experience.
2. METHODS

2.1 Site Description

Baxter State Park is a 209,644 acre protected area approximately two hours north of Bangor, Maine. There are two automobile entrances into the Park; one on the southern edge and one on the northern edge with the prior being the most popular. BSP headquarters is located in the town of Millinocket; which serves as the gateway community for the southern entrance.

There are only two automobile entrances to the Park, one on the southern border and one near the northern border. Hikers may walk into the Park on any trail; however, the only accessible option is the Appalachian Trail intersection 11.5 miles from the base of Mount Katahdin. Here AT hikers are not subjected to the same limitations and regulations that day hikers are required to adhere to. At each of the automobile entrances every car is counted and any hikers wishing to hike Katahdin will be limited by the amount of parking spots available at each trailhead. AT hikers were previously not limited in this manner, but the new AT permitting system begins to treat long-distance hikers in a similar method. The Park contains over 215 miles of hiking trails, 337 campsites, 23 cabins for rent, and 46 miles of maintained dirt road.
Visitors to BSP are presented with a diversity of outdoor recreation based activities to choose from. Some options include: paddling calm ponds or high class white water, snowmobiling on designated roads in the winter, hiking on short accessible paths, backpacking, or climbing the Parks most popular attraction: Mount Katahdin. The Hunt trailhead was selected for Survey because of its unique inclusion of both thru-hikers and day hikers. This trail climbs Mount Katahdin, Maine’s tallest mountain, up a western ridge for an 11-mile round trip hike.

Starting from Katahdin Stream Campground (Figure 2) hikers must first walk through campsites
and lean-tos, pass by information boards, and very occasionally interact with a ranger. A spur trail called the Owl diverges one mile into the hike which, if taken, will guide hikers up to the summit of a neighboring mountain with a view of Mount Katahdin to the East. After the spur trail, the Hunt trail continues on meandering up the West side of Katahdin without breaking tree line until around mile three. Once out of tree line hikers are faced with a Katahdin classic: climbing over giant granite boulders.

One such area of the Hunt Trail, aptly named the monkey bars, contains rebar rungs that help hikers up an otherwise unmanageable pass. The trail eventually scrambles onto the tablelands after a false summit. The tablelands are a vast flat alpine zone just below Baxter Peak (the official summit of Katahdin). This area provides sweeping views and perhaps relief from hikers coming from the Hunt Trail or the Abol Trail which converges with the Hunt at a point called Thoreau Spring. The remainder of the ascent is short and, once on the summit, hikers are gifted with views of surrounding peaks and a large basin below brandishing Chimney Pond. A wooden sign lists the elevation and an indicates that hikers are standing on the Northern terminus of the AT. The summit is the junction of all other trails besides Abol and Hunt. There are four more direct hiking trails as well as many technical climbing routes and some creative options encompassing other peaks to get up the mountain.

2.2 Survey Development

On-site survey instruments were constructed using a process of literature reviews coupled with the feedback and input of partnering agencies (Appendix). Questions included in the questionnaire were developed in conjunction with Park staff to target both research and management needs. Specifically, questions on summit condition preferences mirror those used
in the White Mountain National Forest Visitor Study conducted by the University of Vermont and the United States Forest Service (White Mountain National Forest Report, 2018). The visual method of measuring social norms was used to infer summit condition preferences. These photos, shown in Figure 3, were developed under the guidance of Park staff based on current and predicted use. A series of six photos ranging from 20 people per view (PPV) to 70 people per view were photoshopped by researchers so an accurate range of both current and predicted use could be shown to participants. Hikers were asked other questions on their experience use history, sociodemographic characteristics, and their perceptions of crowding to compare among summit condition variables. Perceptions of crowding was measured using a seven point likert scale from “not crowded at all” to “extremely crowded”. Flow was considered when organizing the survey, and questions were worded to be as clear as possible for participants. The final version of the survey instrument was pre-tested prior to distribution.

Figure 3. Altered Photos. Photos shown to participants edited with Adobe Photoshop used to assess crowding variables. Six photos were presented to participants, only the least dense and most dense photos are shown here.
2.3 Data Collection

Participants for this study included hikers at the trail head for Mount Katahdin’s Hunt Trail in Baxter State Park between July 27th and October 15th 2017. The researcher distributing questionnaires randomly selected the first participant coming down off the mountain, regardless of group size, of every sample day and thereafter sampled the next person to come down the trail as long as the previous participant was completely finished. Hikers were intercepted on their descent of the mountain (Figure 2) to prevent information bias and to preserve wilderness characteristics near the trail head and all voluntary participants were given a juice box upon completion of the survey with the total interaction time lasting between 5 and 15 minute. Only respondents of at least 18 years of age were allowed to participate in the study. For all groups of hikers only one individual was allowed to complete a questionnaire. All voluntary participants were offered a juice box upon completion of the survey.

It is also important to note that visitors who were turned away because they couldn’t find a parking spot were not included in this survey. Those visitors may have different perceptions of crowding but were not able to hike from the Hunt trail based on limitations set by Baxter State Park. Additionally, visitors who’s experiences are highly impacted by crowding may not have been included in this study because they may have avoided climbing Katahdin all together, summited in the winter, or displaced to another area in Maine. Katahdin visitors are prohibited from bringing children younger than six years old up the mountain; which may deter parents from young children from hiking. The absence of young children on the summit of a mountain has potential to affect visitor experience.
2.4 Data Analysis

Analysis for this study was conducted in R programming software. A participant profile was created using visitor characteristics and demographic descriptors. Participants were first split into day hikers and long-distance hikers to assess differences between two user groups. Standard summary statistics were then calculated for relevant variables.

Summit condition perceptions and preferences were measured in people per view (PPV) using four variables: (1) Actual summit conditions, or what the hiker saw and experienced on the summit; (2) Expected summit conditions, or the conditions that represent what the hiker expected to see on the summit before they started hiking; (3) Maximum acceptable conditions, or the conditions that would cause the visitor to not hike/change their plans; (4) Summit conditions which warrant a limit, or conditions that Baxter State Park should not allow. Summary statistics were initially calculated for each crowding variable separated by hiker type. Multiple Welch’s two-sample t tests were used to compare the means of day hikers to long-distance hikers for all four summit condition variables. Using the data collected for each summit condition variable means, standard deviations, and ranges were calculated. Next, this data was visualized using a jitter plot; which is a combination box and scatter plot. Jitter plots add a random amount of variance to each point to separate data points and avoid plotting them on top of each other. Using this method exposes hidden points and provides a more coherent visual for small data sets with discrete responses.

Prior to further analyses a chi-squared goodness of fit test confirmed response uniformity. A series of cross-tabulations, t-tests, non-parametric analyses of variance were used for more robust comparisons. Specific variables relating to use history, trip characteristics, and demographic descriptors were targeted during analysis and were compared amongst summit
condition variables. To achieve this, an additive index was created using three groups of explanatory variables: (1) Hiker Type; (2) Use History; and (3) Experience level. The hiker type variable was binary, and because long-distance hikers expected significantly more than day hikers, a participant could receive either a 2 for long-distance or a 1 for day. The use history variable is also binary but was weighted based on the results from the earlier indicated importance of prior use: If a participant had summited before they received a 2, and if not, a 1. Lastly, the five experience levels were awarded their respective numbers. When added together each participant was given an additive index number. These index numbers could then be used for comparative analyses such as ANOVA by viewing each number as an individual or grouping ranges together.

3. STUDY FINDINGS

Study findings are presented in three sections directly corresponding with the first three study objectives. First a description of the participants from the hiker sample. Next all results discovered using summit condition variables are addressed. The last portion of this section focuses on the outcome of the summit experience inquiries.

3.1 Participant Profile

Within the sample collected for this study 81% of participants were on a day hike and the remaining 19% were long-distance hiking. Within those two groupings the mean group size for day hikers was just over 3.5 and 1.8 for long-distance hikers. The largest group reported was 12 people; though it is important to note that Park regulations specify that groups cannot be larger
than 12. The average age for a day hiker was slightly older than for long-distance hikers at 37 and 33 respectively. The total participant sample from this study was composed 33% of hikers identifying as female and 67% identifying as male. Groups of family members and groups of friends were the two most common group types at 28% and 29% respectively. Four percent of hikers were part of an organized group 15% were hiking alone (22 out of 37 long-distance hikers). Two hundred and eleven participants are from the United States, 35 Canadian, and the remaining 1% is composed of individuals from France, England, Germany, and Morocco. Twenty four states were represented in this sample but just under 50% of day hikers live in Maine and Massachusetts whereas only 23% of long-distance hikers are from those two states. Only 30% of participants had summited Katahdin before and 38% had visited the Park prior to this visit. Almost all hikers who attempted to make it to the summit of Mount Katahdin made it with only 3% (all day hikers) failing to do so.

Participants were asked to provide the time they arrived at the summit and how long they stayed in addition to when they started and ended their hike. The amount of time they stayed was added to the reported time of arrival to give a better picture of the total summit stay. Figure 4 exhibits the density on the summit of long-distance and day hikers by using the calculated central time indicated in participant answers to the aforementioned question. Most hikers converge on the summit between 10:00am and 1:00pm with the most popular time being just before noon.
No significant differences were noted between summit times recorded by day hikers and times recorded by long-distance hikers (chi-squared = 0.21931, df = 1, p-value = 0.6396). A small group of both day and long-distance hikers centered their summit time around 2pm. Day hikers, on average, spent around 36 minutes on the summit (range: 5 minutes to 2 hours). Long-distance hikers stayed on the summit a similar amount of time at 34 minutes (range: 5 minutes to 2 hours).

Like most recreation areas, use is more popular on the weekends in Baxter State Park, which directly impacts the amount of people on the summit and in turn could affect summit condition preferences. Table 2 shows the breakdown between weekend users and weekday users for all summit condition variables including the “feeling of crowding” reported by visitors. It was revealed that although participants reported significantly more PPV on weekends, the groups expected a statistically comparable amount. Interestingly, weekend visitors have a

![Figure 4. Summit density throughout the day on the summit of Mount Katahdin. The two curves represent two hiker types: Day and Long-distance hikers.](image)
significantly higher tolerance for the amount of people on the summit. They also think that just under 90 PPV would warrant a limit whereas weekday visitors felt just over 80 would be more appropriate. There is also a significant difference between how crowded each group felt. The mean “feeling of crowding” for weekenders on a seven point Likert scale from “not crowded at all” to “extremely crowded” was 2.8, slightly higher than 2.3 for weekday visitors.

Table 2. Weekend and Weekday visitors

<table>
<thead>
<tr>
<th>Summit Condition Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Welch’s two sample t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weekday</td>
<td>Weekend</td>
<td>Weekday</td>
</tr>
<tr>
<td>Actual</td>
<td>26.0</td>
<td>37.7</td>
<td>15.6</td>
</tr>
<tr>
<td>Expected</td>
<td>28.1</td>
<td>31.3</td>
<td>15.4</td>
</tr>
<tr>
<td>Maximum</td>
<td>70.5</td>
<td>79.0</td>
<td>21.4</td>
</tr>
<tr>
<td>Limit</td>
<td>81.6</td>
<td>88.8</td>
<td>19.5</td>
</tr>
<tr>
<td>Feeling of Crowding</td>
<td>2.3</td>
<td>2.8</td>
<td>1.5</td>
</tr>
</tbody>
</table>

The differences between weekend and weekday visitors indicate relationships between what day of the week a hiker is visiting and subsequently the amount of people they will see on the summit. This appears to influence user perceptions of crowding, thresholds for personal acceptability, and a preferred limit capacity but does not change the expected social conditions on the summit.

3.2 Visitor Evaluations of Social Conditions on the Summit

Illustrated in Table 3 Long-distance hikers, on average, saw significantly more people on the summit than day hikers (p = 4.7e-07**). Long-distance hikers also expected significantly more PPV on the summit than day hikers (p = 2.6e-4**). There were no significant differences
between day hiker and long-distance hiker personal maximums or the amount of PPV they think warrants a limit (Table 3).

### Table 3. Day and Long-distance hikers

<table>
<thead>
<tr>
<th>Summit Condition Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Welch’s two sample t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day</td>
<td>Long-distance</td>
<td>Day</td>
</tr>
<tr>
<td>Actual</td>
<td>22.8</td>
<td>36.5</td>
<td>14.2</td>
</tr>
<tr>
<td>Expected</td>
<td>23.0</td>
<td>31.2</td>
<td>12.0</td>
</tr>
<tr>
<td>Maximum</td>
<td>60.0</td>
<td>62.6</td>
<td>11.2</td>
</tr>
<tr>
<td>Limit</td>
<td>59.7</td>
<td>58.5</td>
<td>14.7</td>
</tr>
<tr>
<td>Feeling of Crowding</td>
<td>2.3</td>
<td>2.6</td>
<td>1.5</td>
</tr>
</tbody>
</table>

As shown in Table 3 neither day nor long-distance hikers felt very crowded with the means centering on 2.3 and 2.6 respectively. This statistic is consistent with what is seen in the four summit condition variable results – shown in Figure 5.

Summit condition data gathered in this study did not follow a normal distribution nor did it follow the other assumptions for a traditional analysis of variance, so instead a Friedman test, visualized in Figure 5, was utilized to compare variances between the four variables. The results of the Friedman test revealed at least one significant difference ($\chi^2 = 272.65$, $p = 2.2e^{-16}$) leading to a post hoc test to further dissect differences. A Friedman Nemenye post hoc analysis showed significant differences, all with $p$ values less than $2e^{-16}$, between actual and limit warranting conditions, expected and limit warranting conditions, actual and personal maximum, and expected and personal maximum conditions. The results of the post hoc analysis are shown in Table 4.
**Figure 5. Visualizing two distinct groups.** Each summit condition variable has jitter plotted responses and summary statistics displayed using colored boxplots. For this figure, pmax refers to the personal maximum variable described in previous sections.

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Expected</th>
<th>Limit-Warranting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expect</td>
<td>0.996</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Limit Warranting</td>
<td>&lt;2e-16</td>
<td>&lt;2e-16</td>
<td>-</td>
</tr>
<tr>
<td>Personal Maximum</td>
<td>&lt;2e-16</td>
<td>&lt;2e-16</td>
<td>0.007</td>
</tr>
</tbody>
</table>
As illustrated in Figure 5 the significant differences noted in the post hoc analysis compose two distinct pairings. Visitors seem to have a good grasp on what to expect on the summit of BSP based on the results in Table 3 showing statistically similar expected and actual PPV. These results provide a good representation of the entire population of hikers, but further dissection of differences and similarities is discussed in the next section.

3.3 Experience Use History (EUH) and Social Conditions

Objective three requested an in depth look at use and user characteristics that may be influencing condition preferences. After calculating comparisons between day and long-distance hikers the sample was broken down into a different set of groups to analyze the effects of experience use history. First, using multiple, non-parametric analyses of variance and post hoc tests, summit condition variables were tested between two distinct groups: (1) those who have never summited Mount Katahdin before; and (2) those who have been to the Park and had previously summited Mount Katahdin (only three long-distance hikers have previously summited). Results of these tests showed that people who have summited Mount Katahdin before expect statistically similar PPV when compared those who have been to the Park but haven’t summited. Previous summitters did; however, significantly differ from those who have never been in the Park before by expecting a higher amount of PPV on the summit ($Z = -3.158, p = 0.005$). The Kruskal test results for the limit-warranting and personal maximum variables showed no differences between the two use-history groups.

No direct relationship was observed between the experience scale and the perceptions of crowding, but this variable was then used as a piece of an additive index. Results from the initial EUH analyses prompted further tests to gain a more complete view of the characteristics that
lead to certain preferences and expectations. These values were once again compared to perceptions of crowding, but once again no significant trend was observed indicating that previous experience of hiking Mount Katahdin is the only significant variable when predicting crowding perceptions.

4. DISCUSSION

4.1 Current Use Level

Managers at Baxter State Park are dealing with the challenges of an increasing long-distance hiker population using the Appalachian Trail in the Park. Similarly to many other parks and protected areas, the Park trust outlines two main goals: (1) protection of natural resources and; (2) providing quality recreation experiences for visitors, with the latter being the focus of this study. One major concern with increased use of the AT is the potential effect on social experiences. Since a Nobo thru hiker completes their 2,000+ mile journey on the summit of Mount Katahdin, it can be considered a major pillar of their experience, but the majority of hikers on the mountain are day hiking Katahdin with the focus still being the summit. Environmental and ecological impacts were not measured in this study, but instead social parameters were explored to better understand the preferences and perceptions of all types of hikers, though it should be noted that visitors may feel differently about preferences if environmental damage to the area was more visible.

Other studies have conveyed conflicting results when reporting the effects of people per view and perceptions of crowding. Most agree that more PPV leads to higher perceptions of crowding; but whether or not that is a negative experience continues to be up for debate because not all results show that increased crowding leads to diminished experiential evaluation
Regardless, this study showed that current use conditions at Baxter State Park are not leading to widespread high perceptions of crowding and instead most hikers “don’t feel crowded at all”. Also, because actual PPV is significantly lower than personal maximum PPV (in fact most hikers would hike again no matter the PPV) hikers are not experiencing levels of use that would cause them to not want to hike anymore, or to change their plans. Though personal maximums are not being exceeded, reflecting on the consequences of doing so can be an important tool for BSP going forward. We see in Figure 5 that the mean personal maximum is right around 70 people per view with the majority of participants choosing above 60 as an intolerable level. If the Park monitors visitation and sees that there is consistently more than 60 people on the summit at one time (day to day and hour to hour fluctuations should be considered); it is likely that their visitors are not having an ideal experience. If no action is taken to limit the frequency of the 60 person maximum conditions, the population who are unwilling to tolerate that level of crowding will no longer visit Katahdin or potentially the Park. Folks who have a higher tolerance for crowding will continue to patron BSP thus resulting in what is known as a “product shift” where social conditions dictate the visiting population and displace those who don’t prefer it, (Manning et.al, 1999).

Participants also answered whether or not any photographs show summit conditions where Baxter should impose further limits to prevent those PPV levels. Most (91%) of hikers prefer limits in the upper reaches of the PPV scale (50-80 PPV). In Manning’s study of summit condition preferences in Acadia National Park in Maine, he discovered a similar sentiment towards limitations. The White Mountain National Forest survey participants agreed that regardless of use level, limitations are not preferred, indicating a pattern among similar studies

(Manning, 2002; Mestrovic, 2011; Manning, 2000; Kalisch and Klapakhe, 2007; Kohlhardt et al., 2017).
in the Northeast like Manning’s Cadillac Mountain research. These results indicate that current limitations for hikers on Mount Katahdin are successful (day hiker parking lot capacities) and conditions are not reaching undesirable levels in the context of summit conditions variables measured in this study. As many other studies with similar results, further analysis of other experiential and conditional variables helps unravel more complex factors that may influence visitor satisfaction; all of which are discussed in the upcoming sections (Cole and Williams, 2012).

4.2 Day and Long-distance Hikers in the Park

Some of the summit experience variables, including the feeling of crowding, imply homogeneity among day and long-distance hikers. This result is somewhat unanticipated for a few different reasons. First, because long-distance hikers are both overnight users and backpackers it would be inappropriate not to consider them as a unique user group separate from other hikers. Evidence from previous studies explain that different user groups require distinctive experiential qualities during recreation. Conversely, results from this study suggest that day and long-distance hikers prefer similar summit conditions. Though long-distance hikers experienced significantly less PPV than day hikers, the threshold that they consider their personal maximum PPV is statistically similar. Day hikers and long-distance hikers also agree on when to implement further limits on Mount Katahdin’s use, in fact most of each user group would rather have no new limits no matter the PPV. There were; however, differences between these two groups in terms of expected and actual summit PPV. Speculatively these differences could be explained by their recent experience of long-distance hikers on other similar summits (Mount Washington in Vermont for example).
4.3 Experience levels and use history as preference and expectation indicators

Though hiker types presented fairly homogenous results, there were key differences when participants were organized by experience levels and use history. Despite Mount Katahdin’s difficulty rating lending itself to a more experienced groups of hikers, there was a wide range of experience levels, and even individuals who hike less than two times per year. Experience level and use history are used widely as a comparative characteristic in studies of outdoor recreation and visitor use management. Researchers have noted that use history can impact user preferences and tolerances for environmental factors like trampling and campsite conditions (White et al., 2008). Other social and cognitive factors like motivation, place identity and place dependence can also be influenced by experience level (White et al., 2008; Williams et al., 1990). Our results in section 3.3 show differences between use history groups, and trip characteristics; which amplifies previous conclusions that suggest the potential for these factors to affect expectations of social summit conditions. Another factor, use history, came to a similar conclusion. Hikers who have summited Mount Katahdin, not-surprisingly, expected significantly different amounts PPV than those who have never been to the Park before.

Generally speaking, previous on-site experience can impact perceptions of environmental impact and social experiences (Hammit, 1982). The additive index results propose that a person is most likely to have lower personal thresholds for PPV if they are a long-distance hiker, who is extremely experienced, and has summited BSP before. This is a very small demographic; therefore all three factors should be considered both individually and collectively when generating management solutions.
These conclusions call for additional concern regarding displacement; when recreationalists are deterred from visiting a certain area due to environmental or social conditions. Hikers who have summited before, and prefer less PPV may not return to hike again because they know what to expect. Similarly, if a more experienced hiker has a lower personal threshold for PPV they may avoid certain high use areas to preserve their experience. Displacement is becoming a more prevalent topic of discussion in parks and protected area management and is linked with the aforementioned effect of product shift.

5. MANAGEMENT IMPLICATIONS

This study uncovered the complexities of perceptions of crowding, preferred and expected summit conditions, and the variabilities among different types of visitors to Mount Katahdin. Results from this study support other conclusions drawn about the influence of experience use history on perceptions and preferences for social conditions. Though many summit condition variables yielded homogenic answers, there were key differences between those visiting on weekends and weekdays, and some between long-distance and day hikers. Most hikers reported low levels of crowding perceptions and use levels are currently significantly lower than hikers personal carrying-capacities; however Figure 5 shows many outliers that should not be ignored when determining management directions.

Moving forward, use conditions should continue to be monitored in Baxter State Park and information from this study should be used as baseline as use patterns progress. Also, standards of quality can be developed using summit condition norms which can lead to a definition of “appropriate levels of use” defined by visitors for social conditions. To pair with social monitoring and the data retrieved during this study, an environmental impact assessment of trail
and campsites should be conducted. van Riper et al explained that visitors consider resource, social, and management conditions when evaluating an experience, confirming the need for further exploration as these factors work in conjunction with one another, (van Riper et al., 2011). Though we can safely say that use on Katahdin is below social capacity, there are many other situations that could influence visitor satisfaction due to the complexity of the visitor experience.

The information gathered in this study is imperative for further development of management directives aimed at improving or maintaining visitor experiences. Understanding the personal PPV thresholds of hikers can help managers decide when or when not to limit use. Additionally, other management decisions and communication efforts can be informed by utilizing the results of the EUH index. Further research directions should focus on the environmental impacts of increased use to be coupled with the results of this study. Displacement should also be considered for further exploration and during management decisions. Displaced individuals may not have been able to find a parking spot, or they may have never attempted to visit based on expected PPV and their personal threshold for various summit conditions.
CHAPTER 2

THE EFFECTS OF INCREASED USE: A CASE STUDY OF LONG-DISTANCE APPALACHIAN TRAIL HIKER EXPERIENCES NEAR BAXTER STATE PARK

1. INTRODUCTION

1.1 Background Information

After World War II a surge of recreationalists took to the outdoors and popularity in National Parks and Scenic trails has continued to gain momentum, (Manning, 2001). In 2016 the National Park Service celebrated their centennial by promoting visitation to Parks, National Monuments, and National Scenic Trails resulting in record visitation, (National Park Visitor Statistics, 2017). The Appalachian National Scenic Trail (AT) has noted large scale increases in all types of users, including thru-hikers for the past 20 years beyond the boost from the NPS centennial, (Appalachian Trail Hiker Counts, 2016; Baxter State Park, 2017). A thru-hiker walks the entirety of the AT, in any direction, continuously in less than one year. Hiking northbound has proven to be the most popular method of thru-hiking, and near the northern terminus of the trail land managers are beginning to question the impacts of increased use. Baxter State Park is home to Mount Katahdin, the official northernmost point of the AT. Prior to Baxter State Park, the Appalachian Trail Corridor is managed by the Appalachian Trail Conservancy, an off-shoot of NPS. From 2015 to 2016 Baxter State Park (BSP) has received a 23% increase in Appalachian Trail northbound thru hikers. With total thru-hikers per year rising to 2,733 hikers in 2016 from 1,476 hikers in 2010, BSP questioned whether or not the number of hikers
impacted their ability to follow their primary management goals: (1) To protect the natural resources of the Park for their intrinsic value and for the enjoyment of present and future generations and; (2) To provide various appropriate recreational opportunities to Park visitors.

For the purposes of this manuscript, thru-hikers will be included in the definition of a long-distance hiker according to Baxter State Park. Long-distance hikers, as observed by managers, have developed a pattern of prohibited behavior in the Park including hiking in large groups, illegal camping, celebrating on the summit with alcohol and illicit drugs, and a blatant disregard for Park rules and regulations. In 2017 BSP management implemented an AT long-distance hiker permitting system; which limited the number of long-distance hikers in the park on a yearly basis and established a way to monitor hikers on their visit to BSP. The Park allowed for 3,150 hikers in 2017, a 15% increase in long-distance hikers from 2016. This study aims to analyze the direct manifestations of the permitting system and increased use of the AT near the norther terminus of the trail.

1.2 Literature Review

1.2.1 Crowding and Social Carrying Capacities

There is an extensive facet of outdoor recreation research dedicated to crowding and congestion. Though not fully understood, social media and a growing population are potential factors that have contributed to increased use in natural areas. A recent tabulation from the National Park Service shows a record number of people visited National Parks during the heavily promoted centennial celebration in 2016. This type of growth has lead researchers to question the social and biophysical impacts of use and to reexamine both types of carrying capacities. Crowding is known to be a complex subjective term, unique to each individual that can be
influenced by the number of people the individual encounters (Manning, 1999). One way
crowding can manifest in an outdoor recreation setting is in the form of congestion on trails.
Similarly to how congestion forms on roads and highways, trail congestion can form when there
are too many people hiking on a section of trail. Congestion and perceptions of crowding may
lead to diminished visitor experiences; which is why many modern visitor use management plans
consider social carrying capacities (Manning 2001). Much like a physical carrying capacities, a
social carrying capacity refers to a threshold of acceptability for the number of people present.
Perceptions of crowding and conditional preferences can be powerful indicators for social
carrying capacities, a measuring these variables can be a useful tool for managers, because
managerial interpretations do not always represent visitor views (Reigner and Lawson, 2009).

1.2.2 Coping in outdoor recreation

Perceived negative social or physical elements in an outdoor recreation setting can lead to
diminished experiences for recreationalists. These negative elements have the potential to
produce stress which can ultimately lead to the use of coping mechanisms, (Miller and McCool,
2003). An individual’s assessment, or appraisal of a certain element or situation, defines the
level of stress that is experienced. In Figure 6 Lazarus and Folkman’s model of stress appraisal
and response illustrates how an appraisal, influenced by personal and situational factors, can
result in both short and long term effects.
Coping mechanisms can be categorized into four types: displacement, rationalization, product shift, and direct action, (Cole and Williams, 2012; Manning et.al, 1999). Displacement, a behavioral coping mechanism, takes two forms in an outdoor recreation setting: temporal and spatial; which in the context of long-distance hiking is changing the timing of one’s hike (year, season, month, day, hour) and physically changing travel plans. Product shift and rationalization are both cognitive coping strategies that recreationalists can use to deal with adverse situations. Recreation activities are voluntary experiences that can require large amounts of time, effort, and money which can lead recreationalists to reflect on their experience in a positive way regardless of conditions. Product shift, another cognitive adjustment, describes a modified definition of the recreation experience based on experience and expected use levels.

For this study several influencing factors and appraisals were observed to better understand how dealing with the new AT long-distance permitting system has affected hiker short term “outcomes” in the form of a positive or negative feeling. Specifically, management
actions implied as a situational factor, behavioral coping mechanisms, and the positive or negative feelings developed as an outcome.

1.2.3 Permits in wilderness and long-distance trails

BSP represents a very small percentage of Appalachian Trail miles (0.6%). The Park is a part of a small group of land managers which require permits on a collective total of 191 trail miles (8.7% of the AT). Shenandoah National Park contains 105 miles of Appalachian Trail and requires all backcountry hikers to obtain a free permit. AT long-distance hikers can self-register at entry points at any time whereas other backcountry hikers must register during business hours at contact stations. If plans have been settled in advance, hikers can receive permits by mail. In the Great Smoky Mountains National Park AT backcountry hikers are required to reserve and stay in shelters along the 71 miles of trail in the Park. AT hikers do not need to reserve shelters and if the shelter is full upon arrival they are the only user group allowed to tent next to the shelters. It’s also requested that because thru-hikers can tent nearby, they make room for those who have reservations. Permits for AT hikers (considered to be people who started at least 50 miles outside the park and only travel on the AT inside the park) cost $20 and are valid for 38 days from the date issued for up to an 8 day hike through the park. In Shenandoah National Park backcountry travelers are also required to obtain a permit. The permits are free and can be obtained at visitor center during business hours. AT long-distance hikers can self-register for permits at the north and south entry points of the trail. Like Great Smoky, AT hikers can tent nearby if designated shelters are full. Long-distance hiker permits in Shenandoah are free and there are no restrictions on the number of permits available.
Other long-distance trails have incorporated the permit as a management strategy. For example; the Pacific Crest Trail runs from Mexico to Canada through California, Oregon, and Washington. This trail is often called the AT’s west coast counterpart and to thru-hike this trail it is required that you acquire a permit. Up to 50 permits a day are distributed for the starting point in Mexico; which is the most popular place to begin. Other shorter long-distance trails require use permits for their entirety, but it is important to consider a few different management issues associated with long-distance trail and permit application. First, unlike most parks and trails, long-distance trails have thousands of access points. On the Appalachian Trail not only are there an incredible amount of trailheads and intersections there are hundreds of road crossings, some marked and some informal. Secondly, long-distance trails traverse a huge diversity of land type and ownership. On the Appalachian Trail hikers can walk through National and State Parks, privately owned land, and land trusts, but the thin trail corridor itself is managed by the Appalachian Trail Conservancy. The diversity of land ownership lends itself to the variety of rules and regulations hikers are subjected to. Both the ease of access and the assortment of regulations land ownership make monitoring and applying a permitting system to a long-distance trail very challenging.

1.3 Study Objectives and Rationale

Baxter State Park personnel have continuously expressed the need for management action regarding Appalachian Trail long-distance hikers. In BSP released a public letter addressed to the National Park Service and the Appalachian Trail Conservancy stating concern over the increased number and observed behavior choices of long-distance hikers. The letter reiterated that the goals of the Park were being compromised by continuing to allow an unlimited amount
of long-distance hikers into BSP. Ultimately these concerns lead to the 2017 AT Long-distance hiker permitting system. As mentioned previously, this permit annually caps the number of AT long-distance hikers in the Park. This management action was promptly followed by criticism from both the ATC and long-distance hikers themselves. The land managers housing the trail corridor directly adjacent to the park have also stated their concern with the implications of the new permitting system. These managers are particularly concerned with the potential for backlogged hikers who are unable to enter into the park and get a campsite. This type of backup could result in stress and consequently hikers could employ behavioral coping mechanisms to deal with adversity. Additionally, managers are curious about the experiences of long-distance AT hikers on this section of trail. This curiosity and concern established questions surrounding the social preferences, needs, and challenges faced by long-distance hikers on the AT bordering Baxter State Park.

In order to address questions and concerns from management as well as explore the research gaps described in the literature review the following objectives materialized:

1. Determine long-distance hiker preferences and needs for facilities and campsites in the Abol Bridge area.

2. Develop an understanding of both expected/actual social conditions and expected/actual experiences with the permitting system.

3. Establish the sources of information used by AT long-distance hikers for the northern terminus of the trail.
2. METHODS

2.1 Study Site

Abol Bridge was chosen for its ease of access to AT hikers, and its proximity to Baxter State Park, (Figure 7). Abol Bridge is a single-lane bridge that helps vehicles and logging-trucks cross the West branch of the Penobscot River. Traveling northbound along the AT across the bridge there is a small store belonging to the privately owned Abol Campground and Store complex. This is the only available food, drink, internet, and showers for purchase between the 100-Mile-Wilderness and Mount Katahdin so almost all hikers stop here unless they specifically planned to avoid the inflated prices that the store offers. Adjacent to the store, a full service campground provides campsites for tents and RVs alike. Hikers can pay $30 for an individual campsite and shower, or share costs between many hikers. Across the Golden Road and somewhat out of sight the Abol Pines State Campground has tent camping options for a little over $6.00 per night. In the opposite direction walking southbound across the bridge leads you towards the northern entrance of the 100-Mile-Wilderness. White blazes on the back of road signs lead you around 0.1 miles along the Golden Road until you see the funneled entrance on the left. Before arriving at the entrance, hikers pass by Hurd Pond Road; which leads to many popular day hikes in the Debsconeag Lakes Wilderness Area (DLWA). The northern most 17 miles of the AT corridor in the 100-Mile-Wilderness are also located in the DLWA. The DLWA is managed by the Nature Conservancy who’s relationship with the AT and the associated concerns are outlined in section 1.12.
2.2 Survey Development

The survey instrument were created with the guidance of land managers from the Appalachian Trail Conservancy the DLWA, and Baxter State Park. Questions reflected management concerns, observations, and needs. A particular order of close-ended and open-ended questions was used to allow for smoother participant experience based on pretesting (n = 10). Specific crowding and congestion questions reflect previous literature while also incorporating questions targeting long-distance hikers as a unique population.

Measuring displacement and coping mechanisms remains under researched in outdoor recreation; so with limited knowledge this study aimed to collect information from hikers that would begin to explore the levels of displacement caused by social conditions and logistical obstacles for long-distance hikers near the northern terminus of the Appalachian Trail. To do this, hikers were asked a series of questions about expected and actual conditions as well as any ways they attempted to avoid non-satisfactory conditions. Finally, hikers could disclose any direct action they took once confronted by adversity, thus adding another layer to the complexity of coping and displacement for long-distance hikers in this region.

2.3 Data Gathering

Half-page fliers (Appendix) were distributed to long-distance hikers who passed through before dark. Fliers asked five brief questions and then requested an email from the participant for distribution of the self-administered online survey. A census style sampling strategy was used at this location in that every hiker to pass through this point on the trail was asked to participate. The interaction lasted between 30 seconds and 5 minutes followed by a juice box incentive. The survey administrator was positioned just south of Abol Bridge; which allowed
them to intercept both northbound and southbound hikers. At the sampling site northbound hikers have just emerged from the 100-Mile-Wilderness and have 11.5 miles before they reach the base of Mount Katahdin, which leads to the terminus. Inversely southbound hikers have just exited BSP and are about .1 miles from entering the 100-Mile-Wilderness. The Abol Bridge Campground and Store are within view of the sampling location, as is a panoramic view of Mount Katahdin.

Email questionnaires were distributed using an adjusted Dillman’s protocol with an initial email distribution followed by a second and third reminder email. Reminder emails were spread out from October to March to allow for hikers finishing at various dates to gain access to internet or to move to their new location.

2.4 Data Analysis

Completed questionnaires were organized by day and sampling trip. Quantitative data for the on-site questionnaire was entered first into Microsoft Excel and then transferred to R Programming Software. Qualitative data from the online survey was briefly stored and organized in Qualtrics Online Survey Software then transferred into R for analysis. All qualitative data was imported into NVivo Data Analysis Software and stored within the program in its own database. A series of cross-tabulations and t-tests were used to assess differences and compare variables.
3. STUDY FINDINGS

3.3 Participant Profile

Most long-distance hikers identified as Nobo (65%), followed by Flip-flopers and Section hikers both at 13%. Only 4% of hikers identified as Sobo; which may be related to the time of year sampling occurred. The average trip length for long-distance hikers was a little over 5.5 months (178 days) and most participants started their hike in April or May. Seven participants had previously hiked a long-distance trail, all of which either completed the Pacific Crest Trail or the Appalachian Trail in an earlier year. 92% of participants consider themselves either very knowledgeable or extremely knowledgeable of Leave No Trace (LNT) principals, but only 53% believed they followed LNT completely.

3.1 Travel Plans and Patterns

Hikers were asked to mark on a map where they camped in the Abol Bridge region to begin gathering information on how long-distance hikers travel and use this area. Some hikers stayed in more than one location on the map provided, so there was an option to mark three points which were then cross referenced with other responses associated with campsite location. This exercise produced a heat map which is displayed in Figure 7. Not surprisingly, the three highest-density use areas are designated campsites; two Appalachian Trail lean-to sites and the other is the privately owned Abol Bridge Campground. Near these high-density use areas are indications of sprawl, especially near Abol Bridge Campground, as shown by the blue translucent squares. On multiple points along the AT hikers chose to camp at “stealth” sites or undesignated camping areas with varying levels of impact of which some are a major concern for managers. It is apparent from the map, and from responses to other questions about campsites,
that hikers who chose to camp near Abol Bridge Campground did not always stay in a designated area. The sprawl in this area branches out in many directions including south on the AT, north into Baxter State Park, and down unmarked gravel roads. It is important to note that while some campers admitted to camping illegally in this region, there is substantial potential for hikers to be hesitant towards self-reporting even after being briefed on the confidentiality and anonymity of their responses.

**Figure 7. Heat map of campsite choices.** This map is situated over the southern boundary of Baxter State Park (tan) where the Appalachian Trail (brown dotted line) emerges from the Debsconeag Lakes Wilderness Area, part of the 100-mile-wilderness (green). Labeled in white on the map from left to right are three high-density use campsite locations: (A) Rainbow Lake campsite; (B) Hurd Pond lean-to/hut; (C) Abol Bridge Campground. Mileage from A to B is a little over 3 miles, from B to C is roughly 3 miles. Abol Bridge Campground is 1 mile from a Baxter State Park information kiosk, and around 18 miles to the summit of Mount Katahdin.
It was also of interest to collect information from hikers about their general travel plans in Maine before or after their hike through this region, depending on the direction they were hiking (Table 5). This information could paint a more clear picture of what types of travel activities long-distance hikers are partaking in outside of the Appalachian Trail, and if they are bringing more people to the state by inviting family and friends to join them. The mean and median post-hike length of stay in this region for a northbound long-distance hiker was 1.6 days and 1 day respectively. Over half of the respondents stated that they ate at a restaurant in Millinocket, Medway, or East Millinocket; all towns hikers pass through between the southern boundary of Baxter State Park and the highway.

Table 5. Other travel activities for long-distance hikers.

<table>
<thead>
<tr>
<th>Travel activities (option to select all that apply)</th>
<th># of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eat at a restaurant in Millinocket, East Millinocket, or Medway</td>
<td>78</td>
<td>60</td>
</tr>
<tr>
<td>Go shopping or grocery shopping in Millinocket, East Millinocket, or Medway</td>
<td>31</td>
<td>24</td>
</tr>
<tr>
<td>Stay overnight in a hotel or hostel in Millinocket, East Millinocket, or Medway</td>
<td>66</td>
<td>51</td>
</tr>
<tr>
<td>Stay overnight in a campground (not including the birches) in Baxter State Park</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Stay overnight in a campground in this region of Maine</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Stay overnight in a campground in a different region of Maine</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Stay overnight in a hotel or hostel in a different region of Maine</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>Visit Katahdin Woods and Waters National Monument</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Visit Acadia National Park</td>
<td>16</td>
<td>12</td>
</tr>
</tbody>
</table>
The majority of hikers also indicated that they stayed overnight in a hotel or hostel in one of the three towns before or after their hike. Though shopping for groceries seemed like a promising economic investment for long-distance hikers, less than a quarter (24%) stopped to shop as they travelled through town. Only eight hikers said that they visited the new and nearby Katahdin Woods and Waters National before or after their hike.

54 out of the 130 hikers had friends and family meet them either before they started hiking southbound or after they finished hiking northbound (Table 6). Of these respondents, 83% reported that their family or friends ate at a restaurant and 61% stayed at a hotel or hostel in Millinocket, Medway, or East Millinocket. Only 17 of the 54 respondents stated that their family or friends shopped in any of the nearby towns.

Table 6. Other travel activities family and/or friends of long-distance hikers (n = 54)

<table>
<thead>
<tr>
<th>Travel activities (option to select all that apply)</th>
<th># of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eat at a restaurant in Millinocket, East Millinocket, or Medway</td>
<td>45</td>
<td>83</td>
</tr>
<tr>
<td>Go shopping or grocery shopping in Millinocket, East Millinocket, or Medway</td>
<td>17</td>
<td>31</td>
</tr>
<tr>
<td>Stay overnight in a hotel or hostel in Millinocket, East Millinocket, or Medway</td>
<td>33</td>
<td>61</td>
</tr>
<tr>
<td>Stay overnight in a campground (not including the birches) in Baxter State Park</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Stay overnight in a campground in this region of Maine</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Stay overnight in a campground in a different region of Maine</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Stay overnight in a hotel or hostel in a different region of Maine</td>
<td>20</td>
<td>37</td>
</tr>
<tr>
<td>Visit Katahdin Woods and Waters National Monument</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Visit Acadia National Park</td>
<td>16</td>
<td>30</td>
</tr>
</tbody>
</table>
3.4 The Permitting System

It was of peak interest to gather baseline data concerning the Baxter State Park AT long-distance hiker permitting system since 2017 was the inaugural implementation and because of its uniqueness as a management strategy. Of the 130 respondents 89 (68%) of hikers reported that they acquired a permit, 8 (6%) acknowledged that they did not, 4 hikers said that this question did not apply to them, and 29 hikers declined to answer. The hikers that chose “this question does not apply to me” may have also just declined to answer; however, it is likely that these respondents were just unaware that they needed to acquire a permit in the Park. All long-distance hikers, including section hikers are expected to obtain a permit regardless of where they stay overnight. The seemingly high number of non-responses does not come as a huge surprise considering the contentiousness of not obtaining a permit and the lackluster consensus among long-distance hikers about the new permitting regulations.

<table>
<thead>
<tr>
<th></th>
<th>Very easy (1)</th>
<th>Easy (2)</th>
<th>Somewhat Easy (3)</th>
<th>Neutral (4)</th>
<th>Somewhat Difficult (5)</th>
<th>Difficult (6)</th>
<th>Very Difficult (7)</th>
<th>Mean</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected</strong></td>
<td>34</td>
<td>19</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>4</td>
<td>1</td>
<td>2.65a</td>
<td>1.59</td>
</tr>
<tr>
<td><strong>Actual</strong></td>
<td>53</td>
<td>26</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>1.90b</td>
<td>1.26</td>
</tr>
</tbody>
</table>

\( p = 0.00026^* \)

The eight respondents who did not acquire a permit were asked why in an follow up question where they could choose pre-selected options or write their own reasoning. Half of these hikers said that there were “no personnel to administer one to me”. The other half did not see an option that described their situation and instead reported the following as to why they did not obtain a permit:
1. “I reserved a campsite in Baxter State Park”

2. “I registered in Monson”

3. “Stopped at the base of Katahdin and came back to summit as a day hiker two weeks”

4. “I don’t believe or support this type of thing”

The two responses seen above show that hikers assumed that reserving campsites or registering ahead of time dismisses them from the required permit, but that is not the case. Response number three indicates that a hiker left the park and returned as a day hiker later in the season; which would alleviate their need for a permit as long as they are recreating as a day hiker and following the specific regulations associated with that user group. The last response shows a philosophical disapproval of the permitting system and refused to get one for that reason. Although there were only eight hikers who said they did not obtain a permit, they all provided a rationale and may represent hikers who refused to respond or admit that they defied regulations. Only one person, out of all respondents, attempted to avoid getting a permit by using any of the following coping mechanisms: hiking off the designated trail, hiking on a different route, entering Baxter State Park through a different area, not stopping at the permitting area, or other, please specify. The hiker chose “entering Baxter State Park through a different entrance”; signifying that at least one hiker was displaced by the new permitting system.
In the effort to collect as much information as possible about the permitting system’s inaugural implementation participants in this study were given the opportunity to share their experiences in an open-ended question. Not every participant provided a response but for the ones who did there emerged a few reoccurring concepts. First, there was a fairly equal spread of positive and negative narratives written by the respondents. 38% of the written responses depicted negative attitudes about the permitting system with the most common reasoning being misinformation and anxiety or frustration about the process of acquiring a permit. One respondent detailed their experience with Park logistics as such:

“I guess I get [the permitting system], but it seemed like a jarring bureaucratic experience after such a beautiful "free" hike through Maine. Because of the limited capacity of the Birches and Katahdin Stream and the vagaries of weather, I chose to hike to Katahdin Stream, then hitch to Millinocket and get shuttled to Katahdin on a weather-worthy day.”

Some hikers were more explicit in the descriptions of their negative attitudes:

“I don’t support this kind of government control”

“This is the wrong answer to a perceived problem”

“I don’t think there is a need for the permit system, as thru hikers tend to be more familiar with LNT, and have less impact on environment than day hikers
in my experience. The permit system attempts to accommodate all AT hikers, but I gear as AT popularity grows, some may be turned away at the finale of their hike.”

Conversely, a large group of respondents wished to voice their positive experiences and opinions of the permitting system. Common positive themes included the ease of the process and the appreciation for protecting natural resources

“the permitting system allowed me to get information that I would not have gotten otherwise. I feel like they’re doing a great job!”

“Reasonable and appreciated to protect beauty of our nation’s precious natural resources!“

A few respondents felt conflicted, and conveyed divergent thoughts:

“I certainly understand why it’s done. I didn’t mind it; I followed the rules and was respectful. I think day hikers may give thru hikers a bad rap regarding behavior on the summit, but I also can’t deny among thru hikers have a certain sense of ‘I’m done I don’t care anymore.’ If me and my 2 friends had found the thru-hiker site full I can’t guarantee that we wouldn’t have found a space to stealth somewhere.”
Overall, the general sentiment regarding the long-distance hiker permitting system is mixed. Some hikers understand the need for regulation and limitations while others do not see merits in this management strategy. Regardless, it can be valuable for managers to know the range of attitudes associated with their decisions.

3.5 Sources of Information

Long-distance hikers traverse thousands of miles through 14 states and a diversity of land ownership; which necessitates significant planning and research. For this study hikers were asked to provide the sources of information they used to plan for visiting this area of the AT, when they discovered certain information, and whether or not it was useful to them.

3.5.1 The Abol Bridge/Debsconeag Lakes Wilderness Area

First, hikers identified where they gathered information for the general Abol Bridge and Debsconeag Lakes Wilderness Area. The respondents were able to choose from a list of information sources (multiple sources could be selected) or they could elect to write in anything that wasn’t listed. As illustrated in Table 8, the most widely used source of information was an AT guide book of some sort; which 82 hikers used. 35% of respondents talked with other hikers to find out information about this region. The third most popular source listed was the Monson Visitors Center; which was newly established in 2016. Only 3% of respondents specified that they did not use any specific information source for this section of the trail.
Table 8. Sources of Information for the Abol Bridge Region/DLWA

<table>
<thead>
<tr>
<th>Information Source</th>
<th># of respondents who used this source</th>
<th>%</th>
<th># Helpful</th>
<th># Not helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT Guidebook</td>
<td>82</td>
<td>63</td>
<td>80</td>
<td>2</td>
</tr>
<tr>
<td>Online (total)</td>
<td>32</td>
<td>25</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td>Guthook App</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>The Trek Website</td>
<td>1</td>
<td>&lt;1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Youtube</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Facebook</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Reddit</td>
<td>1</td>
<td>&lt;1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ATC Website</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Multiple Websites</td>
<td>17</td>
<td>13</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Visitors Center</td>
<td>23</td>
<td>18</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>Friends and Family</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Other hikers</td>
<td>45</td>
<td>35</td>
<td>43</td>
<td>2</td>
</tr>
<tr>
<td>Other (total)</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Hostel</td>
<td>1</td>
<td>&lt;1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Previous thru-hike</td>
<td>1</td>
<td>&lt;1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ridge-runner</td>
<td>1</td>
<td>&lt;1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Abol Bridge Campground</td>
<td>1</td>
<td>&lt;1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AMC Map</td>
<td>1</td>
<td>&lt;1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>I did not have any information for this section of the AT</td>
<td>4</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The vast majority of respondents considered the information they gathered for this region to be accurate and helpful. The six hikers (one hiker chose two sources) who felt this way listed various reasons, most related to the inaccuracy of mileage or campsite prices. One hiker wrote that an employee at the Monson Maine Visitors Center “made it seem like it was going to be impossible to get a campsite”.

51
3.5.2 Campsite Availability in Baxter State Park

After northbound long-distance hikers exit the 100-mile-wilderness and pass through Abol Bridge they have 11.5 miles before they reach Katahdin Stream Campground at the base of Mount Katahdin where they can check in with a ranger to receive an AT long-distance hiker permit. Less than a mile after Abol Bridge hikers cross over into Baxter State Park where they encounter an AT hiker kiosk containing many fliers of information for hikers as well as the sign in sheet for the special AT Birches campsite in the Park. As stated previously, only 12 hikers are allowed to stay each night which can potentially lead to a displaced hiker if they do not secure a spot. This has been a major concern for managers who have observed illegal camping, or overcrowding at the Birches. Hikers were asked how they informed themselves of the camping availability in the Park to get a better grasp of what information sources are popular and if they were successful in communicating (Table 9).
Table 9. Sources of Information for Campsite Availability in Baxter State Park

<table>
<thead>
<tr>
<th>Information Source</th>
<th># of respondents who used this source</th>
<th>%</th>
<th># Helpful</th>
<th># Not helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATC Website</td>
<td>12</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monson Visitors Center</td>
<td>43</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT Kiosk</td>
<td>34</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSP AT steward</td>
<td>25</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (total)</td>
<td>14</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSP Ranger</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous experience</td>
<td>1</td>
<td>&lt;1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends/Other hikers</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trail Days event</td>
<td>1</td>
<td>&lt;1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hostel</td>
<td>1</td>
<td>&lt;1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guidebook</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social media</td>
<td>1</td>
<td>&lt;1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Maine ranger</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I did not receive information about campsite availability</td>
<td>11</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This question does not apply to me</td>
<td>6</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The variety of sources that hikers used for campsite availability were distributed more evenly than the Abol Bridge/DLWA. 33% of hikers used the new Monson Visitors center to gather this information, 26% used the AT Kiosk in Baxter State Park, and 19% were informed by the AT Steward in the Park. 11 hikers reported not receiving any information about campsite availability in BSP possibly as a result of a lack of effort, or because they were never approached with the appropriate information.
3.5.3 Baxter State Park AT Long-distance Hiker Permit

When the 2017 Baxter State Park was announced the Park released an official statement before adding information for long-distance hikers to their website. There have been numerous efforts to distribute information about the new permitting system to hikers by other groups such as the Appalachian Trail Conservancy and Friends of Baxter State Park. To help managers target messaging and understand any disconnect among information sources the questionnaire included a question that asked hikers to disclose what sources they used to learn about the permitting system, (Table 10).

Table 10. Information Sources for 2017 BSP Permitting System

<table>
<thead>
<tr>
<th>Information Source</th>
<th># of respondents who used this source</th>
<th>%</th>
<th># Helpful</th>
<th># Not helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATC/ATC Website</td>
<td>22</td>
<td>17</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Other Hikers</td>
<td>32</td>
<td>25</td>
<td>28</td>
<td>4</td>
</tr>
<tr>
<td>BSP Website</td>
<td>12</td>
<td>9</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Guidebook</td>
<td>12</td>
<td>9</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Monson Visitors Center</td>
<td>11</td>
<td>8</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Posters</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Other (total)</td>
<td>24</td>
<td>17</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>Ridgerunner</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>BSP AT Kiosk</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>AT steward</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Call to BSP</td>
<td>1</td>
<td>&lt;1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Internet forums</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Hostel</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Social media</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Did not respond</td>
<td>11</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
The most popular information source hikers used for the new permitting system in 2017 were other hikers and word of mouth on the trail. Southbounders were able to inform northbounders and hikers could swap whatever information they had accrued. 17% of hikers were informed by the Appalachian Trail Conservancy in one way or another and only 9% of hikers used the Baxter State Park website. A surprisingly low number of hikers gathered information about the permit from guidebooks (9%) and no one reported the use of guthooks for this question.

For some sources it was obvious when a hiker received information, for example the AT Kiosk in the Park, but for others that are unknown it would be useful to know at one point in the hikers journey research and planning took place. Results of this inquiry are shown in Figure 8. Only 102 hikers provided an answer for this question, but 52 of these respondents discovered information about the permitting system before they began their long-distance hike and 95% of these respondents learned about the permit before arriving to Baxter State Park.

**Figure 8. Point of Discovery for AT Permitting System**
3.6 Challenges and Coping Mechanisms

The last section of the online questionnaire focused on what sorts of adversity hikers face in the Abol Bridge and Baxter State Park portion of the trail. Hikers were able to disclose any challenges they dealt with in an open-ended question but first questions concerning trail and camping congestion were asked to address a specific management concern. After BSP announced that there would be limitations applied to long-distance hikers, adjacent land managers were unsure how this would affect visitor use on their land. Would hikers that get turned away back track to camp? Would there be significant trail congestion during peak finishing season? Will hikers attempt to avoid rules or perceived social obstacles like congestion? Gathering insight during the first implementation of the permitting system provides an opportunity to observe how hiker perceptions and coping mechanisms change over time. To explore these ideas hikers were first asked whether or not they expected congestion at campsites prior to arriving to this segment of the trail. The results were almost an equal split with just under 50% of hikers stating they expected congestion at campsites. Similarly, a somewhat even spread developed as of a result of asking hikers if they expected congestion on the trail itself (59% yes, 41% no). Since this survey was distributed after participants had finished their hike they were able to disclose whether or not they actually experienced congestion. For campsites only 27% ran into congestion and comparably 23% of hikers experienced congestion on the trail itself.

Referring back to the descriptions listed earlier in the introduction, coping mechanisms in an outdoor recreation context can manifest in the form of spatial or temporal displacement. For this reason hikers were asked about the types of pre-emptive coping mechanisms they employed to attempt to avoid congestion (Table 11).
Hikers used a variety of coping mechanisms in an attempt to avoid congestion, most notably 32% of respondents arrived in the area earlier or later in the day. 216% of hikers adjusted their travel plans by arriving earlier or later in the year and 25% of hikers did not use any strategies.

The 27% of hiker who said they actually experienced congestion at campsites were then asked about the direct actions they took to deal with congestion as a form of coping (Table 12). Hikers could chose more than one option, which appeared to be common. Almost half (43%) of the respondents who experienced congestion at campsites took no direct action. The most common coping strategy was to camp in a non-designated campsite aka illegal camping.

<table>
<thead>
<tr>
<th>Coping mechanism</th>
<th># of respondents who used this strategy</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arriving in this area earlier or later in the day</td>
<td>41</td>
<td>32</td>
</tr>
<tr>
<td>Arriving in this area on a certain day of the week</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Arriving in this area earlier or later in the year</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>Reserving a campsite ahead of time</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Booking a hotel or hostel</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Calling ahead to determine campsite availability</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Camping in a completely different area</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Flip-flopping or hiking southbound</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>I did not use any strategies to avoid congestion</td>
<td>36</td>
<td>28</td>
</tr>
</tbody>
</table>
Table 12. Direct Action Coping Mechanisms (n = 35)

<table>
<thead>
<tr>
<th>Coping mechanism</th>
<th># of respondents who used this strategy</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camping in a non-designated campsite</td>
<td>12</td>
<td>34</td>
</tr>
<tr>
<td>Camping in a different designated area</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Backtracking down the trail to find a campsite</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Hiking further along the trail to find a campsite</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Staying in a hotel or hostel</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Asking someone for assistance</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>I did not use any strategies to avoid congestion</td>
<td>15</td>
<td>43</td>
</tr>
</tbody>
</table>

Congestion has the potential to impact visitor experiences; which is why it is such a broadly studied topic in recreation and across other fields. This study asked hikers, regardless of their previous answers, “how did the congestion in this area affect your experience?” The vast majority of respondents indicated that congestion did not affect their experience in either a positive or negative way. 14 hikers felt that congestion influenced their experience in a negative way though 15 felt the opposite and that congestion was a positive influence.

4. DISCUSSION

4.1 Travel Patterns and Visitor Use

When northbound long-distance hikers pass through the Debsconeag Lakes Wilderness Area they will have to plan their campsite choices carefully or be ready to be flexible. If planned
correctly they will be able to camp for free in a lean-to and then proceed directly to the Birches campsite in Baxter State Park before summiting Katahdin. Another option for northbound hikers is to camp overnight at Abol Bridge, perhaps to enjoy the occasionally open restaurant, and then continue into the Park the next morning. According to camping regulations in the Debsconeag Lakes Wilderness Area no hikers should be camping in non-designated areas; however, the Appalachian Trail corridor easement dictates that hikers are free to camp as long as they are a certain distance off the tread. These conflicting rules present an interesting conundrum for hikers deciding where to camp in this reason. Whether or not hikers are consciously thinking about this is up for debate, and maybe there should be a conversation about signage, but nonetheless according to the results of this study there is illegal camping happening in both the DLWA and the Abol Bridge area. This appears to be a relatively small problem but it has potentially negative consequences related to trampling and biophysical impact that managers may need to address.

Before or after summiting Mount Katahdin hikers, on average, stay around one day in this region of Maine. More than half of the long-distance hikers in this study stayed overnight in Millinocket, Medway, or East Millinocket and 60% of hikers shopped for groceries or other items. If this number is any indicator of the general AT population more than 1,500 hikers stay overnight and shop in this area every year; which could be a significant economic contribution to local businesses. In addition to themselves, almost half the hikers had family or friends meet them before or after their hike. 83% of friends or family members ate a restaurant and 61% stayed overnight in this region, adding to the economic participation of this user group. Very few hikers travel to or recreate in other regions of Maine before or after they summit demonstrating the importance of local grocery stores and overnight accommodations.
4.2 Displacement and Coping with Congestion

When Jensen Bissell released the Appalachian Trail permit in 2017 there were immediate and clear negative reactions from former and future AT hikers in addition to the Appalachian Trail Conservancy’s public statement. There was another discourse; however, that emanated from all stakeholders: what are the consequences and impacts of this management action? Their reactions stemmed from a logistical and managerial viewpoint in that they wanted to know how this would impact their land in both a social and biological way. For example, the Debsconeag Lakes Wilderness Area is the last managed land parcel on the Appalachian before crossing into Baxter State Park. This land is managed by the Nature Conservancy and personnel from TNC were, and still are, interested in knowing if the permit limits in the Park would lead to more congestion on their land caused by hikers getting turned away and needed to leave the Park to camp. They also wanted to know if the increased use would lead to more strict policing of the Birches campsite in the Park; which would also lead to backups and congestion on TNC land. In this study we began to uncover how the permitting system directly and indirectly affected hikers and the land use just south of the Park in terms of displacement and coping with congestion.

Just over half of hikers expected congestion at campsites and on the trail in the DLWA/Abol Bridge area but only 27% and 23% respectively actually experienced congestion. This lead to three distinct periods of temporal coping mechanisms: day, week and year (Table 12). Some hikers indicated that they would change the time of day they arrived in this area to avoid congestion or secure a campsite. Hikers frequently asked research personnel at the interception site how many hikers had passed that day and whether or not there were spots available to camp because they “rushed” to make sure they got one. Other hikers changed the
day of the week they arrived in this region to avoid congestion. The summer and fall months are very popular times for day and overnight users to visit this region of Maine, especially on weekends. Hikers may also get spooked by stochastic events like Labor Day weekend or Independence day where notably more recreationalists visit north central Maine. Lastly, some hikers reported arriving to this region earlier or later in the year to avoid congestion. Hikers are already aware of congestion caused by a the general increase in long-distance hiking popularity, which could be confounding variable in this instance. Regardless of reason, hikers are currently changing their travel plans to avoid congestion indicating a potential for more temporally wide spread use. This could either be an opportunity or a challenge for managers. If the population of long-distance hikers continue to increase it will be more challenging for managers to adapt their current resource allocation to account for hiker use on a more dispersed schedule. Conversely, if hikers increases slow or cease managers may be able to adapt to the shoulder season use more appropriately. Monitoring this type of coping and displacement will help inform management actions as yearly changes continue with the long-distance hiking population.

A different kind of coping mechanism, direct action, was also recorded in this study. Hikers may respond to congestion in number of cognitive ways, but managers were primarily concerned with behavioral responses; which are caused by cognitive responses, (Shelby and Heberlein, 1986; Shelby, Bergenzer and Johnson, 1988; Patterson and Hammit, 1992; Shindler and Shelby, 1995; Hoss and Brunson, 2000). The most popular action taken by hikers was to camp in a non-designated area. 34% of hikers stated that they used this action to avoid congestion, 43% said they did not apply any direct actions, and 23% backtracked down the trail to find a campsite. This information extrapolated to future increases could mean new challenges
for managers. If hikers numbers continue to increase more hikers may need to use these actions leading to more people camping illegally and more people backtracking onto TNC land.

Hikers were overtly asked about coping and displacement when dealing with the task of acquiring a permit, but only one respondent reported attempting to avoid getting a permit. This respondent entered Baxter State Park through a different entrance and proceeded as a day hiker. With a very high compliance rate, BSP’s monitoring efforts seem to be reaching almost all hikers, but because this survey was self-reporting there may be a form non-response bias. To conclude, the permitting system is not leading to direct action coping responses by hikers upon their arrival to the Park; however, pre-emptive displacement and coping could be taking place as an indirect result.

4.3 Communicating with Long-distance Hikers

Reaching long-distance hikers with new information presents a challenge due to the variety of sources used by hikers, (Table 8, 9, 10). 21 different sources were used by the participants in this study, showing the diversity of options both hikers and managers face. 60% of hikers used an AT Guidebook of some sort to gather their information on the DLWA and Abol Bridge region so reaching hikers about camping regulations and congestion expectations could be targeted to the various popular guidebooks. Campsite information, on the other hand, was most likely to be obtained at the Monson Visitors Center. This could be explained by the fact that specific campsite availability may not be known until just before hikers arrive. For the permitting system it was observed that most hikers (Figure) have learned about the permitting system before they arrive to Maine and are most likely to gather their information through other hikers and the Appalachian Trail Conservancy (Table 10). Additionally, the expected difficulty
hikers perceive for obtaining a permit is significantly higher than the actual difficulty. This could imply that the information hikers are receiving about the permits suggests that obtaining a permit will be a difficult or confusing process. Other hikers may be embellishing how difficult it is to get a permit, or they may make general statements about stress experienced in this region. Furthermore, information passed through word of mouth can be skewed as it travels along much like a game of telephone. The vast majority of the information received by hikers was helpful to them. This should be noted by managers and other hikers as a success for the communication of these two groups though moving forward a few different management suggestions should be considered.

4.4 Management suggestions

A few important conclusions from this exploratory study can be drawn to help inform management. First, the heat map shown in section 3.2 indicates campsite sprawl throughout the Abol Bridge and DLWA region. If managers want to prevent this type of behavior there are numerous problem and solution combos that could be addressed. For example, new campsites could be added near the edge of the 100-mile-wilderness to accommodate for any hikers who may backtrack down the trail from direct action displacement or those who chose to camp there as a pre-emptive coping mechanism. Another choice could be to increase signage and other direct communication with hikers in this region thus informing hikers as they arrive. Using signage as a communication tool is a heavily researched topic and it is important to carefully consider the type of message chosen. Land managers in this region should also contemplate adding more specific and targeted messaging in the various guidebooks or any other information sources listed in this study. Based on the amount of reviews and downloads, the Guthook app
appears to be gaining ground as a primary information source therefore managers should also consider adding camping information to this source.

Another conclusion derived from this research is the definitive presence of coping mechanisms and displacement as appraisal responses among long-distance hikers in this area. Not all hikers had behavioral responses to congestion or expected congestion but those who did are being displaced on multiple temporal scales. Manning and Valliere (2001) reported, alongside other researchers, that coping mechanisms can be indicative of stressful situations for hikers; which we know from Figure 6 can lead to negative feelings. The level and more detailed causes of stress should be investigated to uncover ways to mitigate future coping and displacement.

Lastly, positive, negative, and mixed attitudes towards the new permitting system were observed in this study. This range of opinions implies assorted short term outcomes. Monitoring attitudes can be useful for Park personnel to help understand the behavioral choices hikers make to deal with perceived problems or conflict. Additionally if long-distance hiker numbers continue to improve, and BSP does not change the cap number for permits, limits may actually be applied and attitudes may change.

5. LIMITATIONS

This methodological approach described in this study has serval limitations. First, the sampling design used in this study aimed to systematically gather data from participants on both weekends and weekdays, throughout the busiest season (July to October), from mid-morning till dark. Hikers who crossed through the sampling site early in the morning or after dark were likely not sampled, and therefore were not represented. Similarly, hikers who chose to start or
finish their hike in the off season were missed. These hikers may have a completely different social experience in Baxter State Park and Abol Bridge and therefore may have different perceptions of congestion. The completely displaced hikers, those who chose not to hike at all based on the current social conditions of the trail, are another unrepresented group in this sample. Displacement will continue to be a topic of interest in outdoor recreation research because it is challenging to measure. Though there are limitations of this study it adds to the growing body of literature surrounding coping behaviors and displacement by providing a method to measure preemptive and direct action coping mechanism in long-distance hikers.
CHAPTER 3

REFLECTION AND LESSONS LEARNED

1. REFLECTIONS AND DISCUSSION

This purpose of this section is to reflect upon my experiences as a graduate student and to summarize challenges and success that developed during the duration of this study. Each subsection details any thoughts or contemplation I’ve had since conducting each portion of the research process.

1.1 Project Development

My background, prior to arriving at the University of Maine, was in biology and environmental science accompanied with two years of trail work. For this reason social science was a new concept for me besides a superficial understanding of what social science meant. That being said, after four seasons of trail work and a stint on the Appalachian Trail and Baxter State Park I had a strong familiarity with trail systems and long-distance hiking. I wanted these experiences to be a part of my research but I had no idea how to incorporate them; this lead to many iterations of the project before finally settling on something solid and meaningful. Project development was challenging. Starting from nothing meant that classes that ask students to write papers about a “topic of your choice” stood as both an opportunity to explore, but more than likely it felt like I was far behind everyone else.

Overall, the project development phase was incredibly beneficial for my understanding of scientific research, stakeholder engagement, and the arduous process of grant acquisition. I found the most productive strategies for creating a project developed from brainstorming with
Dr. Daigle. I would gather three or four ideas each week and we would work through the efficacy of each study and how likely it would be to gather enough resources to conduct them. Many times I would present a project that had a massive scope and would require an enormous amount of resources, but Dr. Daigle could bring me back down to earth when I had my head in the clouds. Project development was about trust, patience, critical thinking, and exploration. Contrarily, grant acquisition was about learning from failure and perseverance. Reaching out to organizations and individuals for money felt so unnatural for me, and it still remains my least favorite part of research, but there were still many lessons learned. Failure is immanent. Looking back, applying for grants is similar to a batting average in that you “fail” much more often than you succeed. I put fail in quotations because every grant that I did not secure, though non-lucrative, was an opportunity to learn from mistakes and do better which took perseverance and determination.

1.2 Field Work

In past projects and experiences my field work has been physically demanding, sometimes in remote backcountry settings so the field work for this study was a change of pace. When I was waiting for long-distance hikers at Abol Bridge there were days where I would wait for hours before someone would walk up to me. These were very long days where I learned to process information I had already gathered, or read papers. I was also incredibly nervous about the reaction I would receive from hikers when I asked them to take a survey. It seemed challenging to me to not take things personally if someone refused to participate or if I received negative feedback but I was pleasantly surprised by the amount of positive comments I received. We were also dubious about the use of an email considering the circumstances of long-distance
hikers. Would hikers be able to check their email? Would hikers be willing to respond? The answers to those questions were yes, and only if the hikers are given information about the project and its importance. Long-distance hikers on the Appalachian Trail have a surprising amount of internet access and many use app based guidebooks. I learned quickly that hikers who came all the way from Georgia have been asked to take MANY surveys, so they were almost numb to my proposition. I had to quickly explain to hikers that this wouldn’t take long and that there was a juice box with their name on it if they participated. I also needed to tell them, as briefly as possible, how this study was going to be beneficial to the trail and to them, which was not easy. Dr. Daigle and I toyed with the idea of having me walk with hikers to do the survey with them when we were determining methods. This quickly became a daily reality and the only way to convince some hikers to work with me. Hikers coming down off Katahdin were not quite as simple. They were tired and required a bit more convincing but the juice box incentive really hit home with them. If I were to do this all over again I would go all out with a wilderness lemonade stand; Merrell actually hired a few former long-distance hikers to carry a pop-up lemonade stand to backcountry locations.

1.3 Writing

Starting the writing process was difficult. The task of digesting and writing a thesis is just below impossible; which is why starting was so trying. I had never used many of the analysis techniques and I had never composed a document of this size. My most valuable tool for this mission was to not force it when things weren’t going as planned and to ride the groove when they were. I was given the advice that “if you write one page a day, your thesis will write itself”. Unfortunately that just didn’t work for me. Instead, when I was writing well, and pages
were flowing I would push it until consistent progress stopped. When I could not write more than one sentence a day, I would work on other things and not force it because the only result that would produce is bad writing. Another helpful tool was speaking with others about their struggles. Hearing that their experiences echoed mine gave me a much needed boost of solidarity. If I were to give my past self advice for the writing portion I would stress that editing a thesis deserves and takes a lot of time.
BIBLIOGRAPHY


APPENDIX A: QUESTIONNAIRES

1. HUNT TRAIL QUESTIONNAIRE

Hunt Trail – Mount Katahdin Visitor Survey - 2017

The first portion of the survey will ask clarifying questions about your trip to Baxter State Park and Mount Katahdin. Please answer all questions to the best of your knowledge. Note: a thru-hiker is someone intending to complete the entire Appalachian Trail within one calendar year.

1. Including yourself, how many people are in your personal group on this trip?
   Number of people: ______

   Were these people (skip if you are alone)
   Family
   Family plus friends
   Friends
   From an organization (Scouts, Club, Guide, etc.)
   Other (please specify) __________________________

2. What type of visit are you on today?
   Day hike – no overnight stay in the park
   Day hike – overnight stay in the park
   Section hike of the Appalachian Trail (start at least 50 miles outside the park)
   Northbound Appalachian Trail thru-hiker
   Southbound Appalachian Trail thru-hiker
   Flip-flop Appalachian Trail thru-hiker
   Other (please specify) __________________________

3. If you are a thru hiker please indicate what date you started your hike:
   Start date: ___/___/____

4. Which trailhead did you start your hike from today?
   Katahdin Stream - Hunt Trail
   Abol Field – Abol Trail
   Roaring Brook – Chimney Pond Trail
   Roaring Brook – Helon Taylor Trail
   Appalachian Trail beyond park boundaries
   Other (please specify) __________________________

5. What time did you start your hike today?
   _______ AM   PM

6. Did you see more people on your way up or your way down the mountain today?
7. How did you feel about the number of other people you saw per hour while hiking on the Hunt Trail (not including the summit)?
   - Saw way too few
   - Saw too few
   - About right
   - Saw too many
   - Saw way too many
   Doesn’t matter to me one way or the other

8. During your visit to Mount Katahdin did you experience any congestion on the trail (not including the summit) that interfered with your ability to hike at the pace you desired?
   - Yes
   - No

9. If yes, how did you respond to congestion on the trail?
   - I traveled slower than expected
   - I traveled faster than expected

10. Did congestion from the number of other hikers on the trail (not including the summit) interfere with your freedom to move and/or stop as you wished? (Please check only one response.)
    - yes, frequently
    - yes, occasionally
    - no, never

This next section will address your experiences on the summit. For certain questions you will need to refer to the photographs provided to you by the survey administrator.

11. Did you reach the summit of Mount Katahdin (Baxter Peak) today?
    - Yes
    - No

If Yes please continue through this section, if No please skip ahead to number 23.

12. If yes, at approximately what time did you reach the summit?
    Approximate time: _______ AM PM

13. Approximately how long did you stay at the summit?
    Approximately ________ hours minutes

14. What led you to stay at the summit for as long as you did? Please check all that apply.
    - Fatigue/needed to rest
    - Needed to eat
    - Wanted to enjoy the view as long as possible
    - Take pictures
    - Waiting for friends or family to arrive
    - Approaching storm or rain
    - Had to wait in line to take pictures of the sign
    - Other (please specify) ____________________________
15. On the summit did you notice other visitors partaking in any of the following behaviors:
   - Drinking alcohol
   - Smoking
   - Playing music
   - Yelling or talking loudly
   - Littering
   - Standing on top of the Katahdin sign
   - Hanging out in a large group
   - I did not see any of these behaviors
   - This question does not apply to me

16. On the summit did the behavior of other visitors have an impact on your experience?
   - Yes
   - No
   - This question does not apply to me

17. If yes, please indicate on the scale how positively or negatively the behavior of other visitors impacted your experience at the summit of Mount Katahdin:

   1..................2..................3..................4..................5..................6..................7
   Extremely Negative  Negative  Somewhat Neutral  Somewhat Positive  Positive

18. Which photograph looks most like the conditions you typically saw on the summit today?
   - Photo 1
   - Photo 2
   - Photo 3
   - Photo 4
   - Photo 5
   - Photo 6

19. Which photograph shows the number of hikers that you expected to see at the summit at one time?
   - Photo 1
   - Photo 2
   - Photo 3
   - Photo 4
   - Photo 5
   - Photo 6

20. Which photo shows the maximum number of hikers at one time you think Baxter State Park should allow on the summit? In other words, at what point should the number of hikers on Katahdin be limited?
   - Photo 1
   - Photo 2
   - Photo 3
There should not be a limit to the number of hikers.

21. Which photograph shows the maximum number of hikers at one time on the summit before you would not hike here again or you would shift your use to a different location or time?
   - Photo 1
   - Photo 2
   - Photo 3
   - Photo 4
   - Photo 5
   - Photo 6
   I would hike here again no matter what

22. Please use the scale below to rate how crowded you felt during your visit to the summit of Mount Katahdin today *(please circle your number)*

   1…………………………2………………..3………………..4………………..5………………..6………………..7

   Not at all                      Neutral                      Extremely
   Crowded                       Crowded

*The last section of the survey will include a group of questions that will tell us a little more about you and your experiences as an outdoor recreationalist.*

23. Do you live in the United States?
   - Yes – zip code: __________
   - No – country of origin: ________________________________

24. Are you currently, or have you ever served with the United States Military?
   - Yes
   - No

25. Are you currently, or have you ever served with the military of another country?
   - Yes
   - No

26. In what year were you born?
   ________

27. What is your gender?
   - Female
   - Male
   - Other *(please specify)* ________________________________
   - Prefer not to answer
28. Which of the following activities, if any, do you plan on taking part in on this particular trip?

- Eat at a restaurant in Millinocket, Medway, or East Millinocket
- Go shopping in Millinocket, Medway, or East Millinocket
- Stay overnight in a hotel or hostel in Millinocket, Medway, or East Millinocket
  number of nights: ________
- Stay overnight in a campground in Baxter State Park
  number of nights: ________
- Stay overnight in a campground in this region of Maine
  number of nights: ________
- Visit Katahdin Woods and Waters National Monument
- Stay overnight in a hotel or hostel in a different region of Maine
  number of nights: ________
- Stay overnight in a campground in a different region of Maine
  number of nights: ________
- Visit Acadia National Park
- I do not plan to take part in any of these activities

29. Is this your first visit to Baxter State Park?
   Yes
   No

30. If no, how many times a year do you visit Baxter State Park?
   ________ times per year

31. How many times do you visit other areas like Baxter State Park?
   ________ times per year

32. How valuable are recreation experiences like hiking Mount Katahdin to you personally?
   Extremely valuable
   Very valuable
   Fairly valuable
   Neutral
   Not very valuable
   Not at all valuable

Is there anything you would like to share with us about your experience hiking on the Hunt Trail on Mount Katahdin?
___________________________________________________________________________________________
___________________________________________________________________________________________
Thank you so much for your help with this survey! Your responses are anonymous and confidential. Please return your completed questionnaire to the survey administrator.

For administrative use only

Trip #:_______ Date:_______ Time:_______ Administrator initials:_______

Notes:

2. ABOL BRIDGE ON-SITE FLIER

2.1 Front

Appalachian Trail Thru-Hiker Study

Hello – My name is Leah and I am a graduate student at the University of Maine. I am working with landowners in this area to help assess travel and camping experiences of thru-hikers. To ensure high quality visitor experiences, and appropriate resource use, we need a better understanding of the recreational use occurring in the area. We would greatly appreciate if you would be willing to fill out this card and receive an email survey that will be sent after your trip.

Your participation in this survey is voluntary. Since each person emailed a survey will represent many others who will not be surveyed, your cooperation is extremely important. The answers you provide will be confidential. Our results will be summarized so that the answers you provide cannot be associated with you
or anyone in your group or household. Your email address will not be given to any other group or used by us beyond the purposes of this study.

University of Maine  
Parks, Recreation and Tourism Program  
5755 Nutting Hall  
Orono, ME 04469-5755

2.2 Back

Date: ______________

1) How far did you hike from your last campsite? ________ MILES

2) What type of hiker would you classify yourself as? (Please mark)
   ___ Northbound Appalachian Trail thru-hiker
   ___ Southbound Appalachian Trail thru-hiker
   ___ Flip-Flop Appalachian Trail thru-hiker
   ___ Appalachian Trail section hiker (example: 100-mile wilderness)
   ___ Day hiker
   ___ Other: ____________________________

3) What kind of group are you with? (Please mark)
   ___ Alone
   ___ Family or friends
   ___ Family plus friends
   ___ From an organization (Scouts, Club, etc.)
   ___ Other (describe ________________________________)

4) How many people are in your group? _____ PEOPLE

5) Do you know the name of the landowner whom the last 17 miles of trail trail is on?
   ___ NO    ___ YES - please identify: ________________________________
6) To participate in the email survey please provide:

EMAIL: __________________________________________

THANK YOU!
3. ABOL BRIDGE EMAIL QUESTIONNAIRE

University of Maine - Abol Bridge Survey

Start of Block: Section 1

Q1 In the first section of the survey we would like to learn about you as a hiker as well as your experience hiking and camping in the Abol Bridge Area/ Debsconeag Lakes Wilderness Area adjacent to Baxter State Park and the northern terminus of the Appalachian Trail in Maine. This map will reappear later for your reference.
Q2 What type of hiker would you classify yourself as?

- Northbound Appalachian Trail thru-hiker (1)
- Southbound Appalachian Trail thru-hiker (2)
- Flip-Flop Appalachian Trail thru-hiker (3)
- Appalachian Trail section hiker (4)
- Day hiker (5)
- Other - please explain (6) ____________________________________________

Q3 If you are a thru-hiker please indicate what date you started your hike and what date you ended or finished your hike. If you have not yet finished your hike then please type "N/A" into the End date box.

- Start date (1) ____________________________________________
- End date (2) ____________________________________________

Q4 Have you ever thru-hiked the Appalachian Trail in the past?

- Yes - year of completion: (1) ____________________________________________
- No (2)

Q5 Have you ever thru-hiked any of the following long-distance trails?

- Pacific Crest Trail (1)
- Continental Divide Trail (2)
- I have not thru-hiked either of these trails (3)
Q6 How knowledgeable would you consider yourself on Leave No Trace principals and minimum impact hiking?
   - Extremely knowledgeable (1)
   - Very knowledgeable (2)
   - Moderately knowledgeable (3)
   - Slightly knowledgeable (4)
   - Not knowledgeable at all (5)

Q7 How closely did you follow the principles of Leave No Trace (LNT) while hiking on the Appalachian Trail (especially in Maine and Baxter State Park)?

   LNT Principles: 1) plan ahead and prepare; 2) travel and camp on durable surfaces; 3) dispose of waste properly; 4) leave what you find; 5) minimize campfire impacts; 6) respect wildlife; 7) be considerate of other visitors
   - I followed Leave No Trace completely (1)
   - I closely followed Leave No Trace but not always (2)
   - I somewhat followed Leave No Trace (3)
   - I rarely followed Leave No Trace (4)
   - I never followed Leave No Trace (5)
Q8 Below is the map of the Debsconeag Lakes Wilderness Area and Abol Bridge Area just south of Baxter State Park. Please indicate on the map over any areas that you camped at (if you camped in more than one area please select those as well):

Q9 If you know the name of the campsite/campground please list it here:
Q10 Additionally, did you camp at either of the following campsites near Rainbow Lake?

☐ Rainbow Dam (1)

☐ Rainbow Stream lean-to (2)

☐ Rainbow Lake campsites (3)

☐ Other (please indicate) (4)

Q11 Was your campsite(s) designated use?

Yes (1)

No (2)

This question does not apply to me (3)

Q12 How many people did you camp with at your site(s) including yourself?

Number of people: (1) ________________________________________________

This question does not apply to me (2)

Q13 How many nights did you stay in this area (area indicated on the map as well as Rainbow Lake area)?

Number of nights: (1) ________________________________________________

This question does not apply to me (2)
Q14 Did you pay for a campsite in this area?

Yes - please indicate how much you paid (1)

No (2)

This question does not apply to me (3)

Q15 Please indicate on the scale below the condition your campsite(s) was/were in when you arrived at them:

<table>
<thead>
<tr>
<th>Campsite condition</th>
<th>Very bad (1)</th>
<th>Bad (2)</th>
<th>Somewhat bad (3)</th>
<th>Neither good nor bad (4)</th>
<th>Somewhat good (5)</th>
<th>Good (6)</th>
<th>Very good (7)</th>
</tr>
</thead>
</table>

Q16 Prior to arriving to this area did you expect congestion at designated campsites?

Yes (1)

No (2)

Q17 Prior to arriving to the Abol Bridge/Debsconeag Lakes Wilderness Area did you expect crowding or congestion along the Appalachian Trail?

Yes (1)

No (2)
Q18 Did you attempt to avoid congestion by utilizing any of the following strategies? *Please check all that apply:*

- [ ] Arriving in this area earlier or later in the day (1)
- [ ] Arriving in this area on a specific day of the week (2)
- [ ] Arriving in this area earlier or later in the year/finishing season (3)
- [ ] Reserving a campsite ahead of time (4)
- [ ] Booking a hotel or hostel (5)
- [ ] Calling ahead to determine campsite availability (6)
- [ ] Camping in a completely different area (7)
- [ ] Flip-flopping or hiking southbound (8)
- [ ] Other (please specify) (9)
- [ ] I did not use any strategies to avoid congestion (10)

Q19 When you arrived did you actually *experience* congestion at your campsites in this area?

- [ ] Yes (1)
- [ ] No (2)
Q20 When you arrived did you actually experience congestion or crowding on the Appalachian Trail in this Area?
   Yes (1)
   No (2)

Q21 Did you attempt to avoid congestion you experienced by utilizing any of the following strategies? Please check all that apply:

- Camping in a non-designated campsite (1)
- Camping in a different designated area (2)
- Backtracking along the trail to find a different campsite (3)
- Hiking further along the trail to find a different campsite (4)
- Staying in a hotel or hostel (5)
- Asking a ranger, land manager, or local business, or another person for assistance (6)
- Other (please specify) (7)

☐ I did not use any strategies to avoid congestion (8)

Q22 Were your attempts to avoid congestion successful?
   Yes (1)
   Maybe (2)
   No (3)
   This question does not apply to me (4)
Q23 Overall, how did congestion affect your experience at the Abol Bridge area?

<table>
<thead>
<tr>
<th></th>
<th>Very negatively (1)</th>
<th>Negatively (2)</th>
<th>Somewhat negatively (3)</th>
<th>Neither positively or negatively (4)</th>
<th>Somewhat positively (5)</th>
<th>Positively (6)</th>
<th>Very Positively (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>congested (1)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q24 Did your campsites have a fire ring?

- Yes (1)
- No (2)
- This question does not apply to me (3)

Q25 Did you make a fire at your campsite in the Debsconeag Lakes Wilderness Area or in the Abol Bridge Area?

- Yes (1)
- No (2)
- This question does not apply to me (3)

End of Block: Section 1

Start of Block: Section 2

Q26 In this next section you will find questions about your experience with the new Baxter State Park Long-distance Hiker permits and Baxter State Park in general. Please answer each question to the best of your memory.
Q27 Prior to entering Baxter State Park did you expect to get a spot at the Birches AT hiker campsite on the day you arrived?
   Yes (1)
   No (2)
   This question does not apply to me (3)

Q28 Upon arrival to Baxter State Park did you actually secure a spot at the Birches AT hiker campsite on the day you arrived?
   Yes (1)
   No (2)
   This question does not apply to me (3)

Q29 How many days did you need to wait to get a spot at the Birches AT hiker campsite?
   I did not have to wait any days (1)
   1 day (2)
   2 days (3)
   3 days (4)
   more than 3 days (5)
   This question does not apply to me (6)
Q30 Where did you receive information about campsite availability in Baxter State Park?

☐ Appalachian Trail Conservancy website (1)

☐ Monson Visitors Center (2)

☐ AT kiosk near Baxter State Park (3)

☐ Appalachian Trail Steward in Baxter State Park (4)

☐ Other (please explain): (5)

________________________________________________

☐ I did not receive information about campsite availability in Baxter State Park (6)

☐ This question does not apply to me (7)

Q31 Prior to entering Baxter State Park did you expect to get a Baxter State Park AT Long-distance Hiker Permit?

   Yes (1)

   No (2)

   This question does not apply to me (3)
Q32 Please mark on the scale below how easy or difficult you *expected* acquiring a Baxter State Park AT Long-distance Hiker Permit?

<table>
<thead>
<tr>
<th>expected ease or difficulty</th>
<th>Very difficult (1)</th>
<th>Difficult (2)</th>
<th>Somewhat difficult (3)</th>
<th>Neutral (4)</th>
<th>Somewhat easy (5)</th>
<th>Easy (6)</th>
<th>Very Easy (7)</th>
<th>This question does not apply to me (8)</th>
</tr>
</thead>
</table>

Q33 After entering the Park did you actually *acquire* a Baxter State Park AT Long-distance Hiker Permit?

Yes (1)
No (2)
This question does not apply to me (3)

Q34 If no, please indicate why you did not acquire a permit (*check all that apply)*:

- No personnel to administer one to me (1)
- Did not want to wait in line (2)
- All 2017 permits had already been administered (3)
- I did not think or know that I needed one (4)
- Other: ________________________________ (5)
- This question does not apply to me (6)
Q35 Did you partake in any of the following activities in order to avoid obtaining a permit?

- [ ] Hiking off the designated trail (1)
- [ ] Hiking on a different trail or route (2)
- [ ] Entering Baxter State Park through a different area (3)
- [ ] Not stopping at the permitting area (4)
- [ ] Other: ________________________________ (5)
- [ ] I did not partake in any of these behaviors (6)
- [ ] This question does not apply to me (7)

Q36 If you did get a permit, please rate how easy or difficult actually acquiring a Baxter State Park AT Long-distance Hiker Permit was for you:

<table>
<thead>
<tr>
<th>Ease or difficulty (1)</th>
<th>Very difficult (1)</th>
<th>Difficult (2)</th>
<th>Somewhat difficult (3)</th>
<th>Neutral (4)</th>
<th>Somewhat easy (5)</th>
<th>Easy (6)</th>
<th>Very easy (7)</th>
</tr>
</thead>
</table>

Q37 How did you hear about the permitting system prior to arriving in Baxter State Park?

________________________________________________________________________________________
Q38 At what point did you discover this information?
   Before I began hiking (1)
   At the very beginning of my hike (2)
   During my hike before reaching Maine (3)
   During my hike in Maine (4)
   Monson Visitors Center (5)
   Upon my arrival to Baxter State Park (6)
   I never heard about the permitting system (7)
   This question does not apply to me (8)

Q39 Was the information you received accurate and helpful?
   Yes - please explain: (1) ________________________________________________
   No - please explain: (2) ________________________________________________

Q40 Please tell us anything else you wish to share about your experience with the new Baxter State Park Long-distance Hiker permitting system:
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

Q41 Please tell us anything else you would like to share about your experience in Baxter State Park:
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________
Q42 Finally, the last group of questions will inquire about what you did after your hike and your opinion of the resources available in the Abol Bridge Area/Debsconeag Lakes Wilderness Area. You will also find questions that will tell us a little more about you as a person.

Q43 How did you find information about this section of the AT (the Debsconeag Lakes Wilderness Area/the Abol Bridge area)?

- [ ] AT guide book (1)
- [ ] Online - please specify: (2)
- [ ] Visitors center (3)
- [ ] Friends/family (4)
- [ ] Other hikers (5)
- [ ] Other - please specify: (6)
- [ ] I did not have any information on this section of the AT (7)
Q44 Did you find this information accurate and helpful?
   Yes - please explain: (1) ________________________________
   No - please explain (2) ________________________________
   This question does not apply to me (3)

Q45 Did you find the amenities in this area adequate for your needs?
   Yes (1)
   No - please comment on the other types of amenities missing in this area that you would like to see: (2) ________________________________

Q46 Specifically, do you think more designated campsites are needed in the area?
   Yes (1)
   No (2)
   Not sure (3)

Q47 If more campsites were added in this area, how much (if any) would you be willing to pay for a campsite?
   I would not pay any amount (1)
   up to $5.00 (2)
   up to $10.00 (3)
   up to $20.00 (4)
   up to $30.00 (5)
   up to $40.00 (6)
   up to $50.00 (7)

Q48 Please describe any challenges you encountered in this area:
   ___________________________________________________________________________________
   ___________________________________________________________________________________
Q49 Which of the following activities, if any did you take part in before or after your hike in this area?

☐ Eat at a restaurant in Millinocket, Medway, or East Millinocket (1)

☐ Go shopping in Millinocket, Medway, or East Millinocket (2)

☐ Stay over night in a hotel or hostel in Millinocket, Medway or East Millinocket (3)

☐ Stay overnight in a campground (not including the Birches) in Baxter State Park (4)

☐ Stay overnight in a campground in the region (5)

☐ Stay overnight in campground in a different region of Maine (6)

☐ Stay overnight in a hotel or hostel in a different region of Maine (7)

☐ Visit Katahdin Woods and Waters National Monument (8)

☐ Visit Acadia National Park (9)

Q50 If you were hiking northbound through this section of the AT, how long did you stay in this area of Maine after your hike?

Number of nights: (1) ________________________________
Q51 Did you have family/friends meet you before, after, or during your hike through this area?
   Yes  (1)
   No  (2)

Q52 If yes, did your family or friends take part in any of the following activities (check all that apply):

☐ Eat at a restaurant in Millinocket, Medway, or East Millinocket  (1)
☐ Go shopping in Millinocket, Medway, or East Millinocket  (2)
☐ Stay overnight in a hotel or hostel in Millinocket, Medway or East Millinocket  (3)
☐ Stay overnight in a campground (not including the Birches) in Baxter State Park  (4)
☐ Stay overnight in a campground in the region  (5)
☐ Stay overnight in campground in a different region of Maine  (6)
☐ Visit Katahdin Woods and Waters National Monument  (7)
☐ Visit Acadia National Park  (8)
☐ They did not participate in any of these activities  (9)
☐ This question does not apply to me  (10)
Q53 What is your gender?

Male (1)
Female (2)
Other - please specify (3) ________________________________________________
Prefer not to answer (4)

Q54 In what year were you born?

______________________________________________________________

Q55 Do you live in the United States?

Yes - zip code: (1) ________________________________________________
No - country of origin: (2) ________________________________________________

Q56 Are you a veteran or currently serving in the United States Military?

Yes (1)
No (2)

Q57 Are you a veteran or currently serving in a military or another country?

Yes (1)
No (2)

Q58 Thank you so much for sharing your experiences and helping with this survey! Your responses are both anonymous and confidential.

End of Block: Section 3
APPENDIX B: ALTERED PHOTOGRAPHS

1. 20 PEOPLE PER VIEW

2. 30 PEOPLE PER VIEW

3. 40 PEOPLE PER VIEW
4. 50 PEOPLE PER VIEW

5. 60 PEOPLE PER VIEW

6. 70 PEOPLE PER VIEW
November 19, 2014

Ron Tipton, Executive Director
Appalachian Trail Conservancy
799 Washington Street
P.O. Box 807
Harper’s Ferry, WV 25425-0807

Wendy Janssen
Appalachian Trail Park Office
PO Box 50
Harpers Ferry, WV 25425-0050

Dear Ron and Wendy,

I'm writing to document increasing concerns we are having with the accommodation of Appalachian Trail hikers within Baxter State Park.

Background

Baxter State Park hosts the northernmost 15 miles of the Appalachian Trail, including the terminus of the 2,180 mile trail at Baxter Peak on Katahdin. The Appalachian Trail (AT) within Baxter Park utilizes existing hiking trails that are part of the 225 mile Park trail system. While much of the AT is designated as a National Scenic Trail, within the boundaries of Baxter State Park the AT has no federal designation and is under the control of the Baxter State Park Authority. Baxter State Park is managed as a large public trust and is governed by the Baxter State Park Authority. The Authority is guided in the administration of the Park by the Trustor’s formal deeds and communications that specify how he wished the Park to be managed. The trust communications provide no direct reference to the AT or its accommodation within the Park.

Northbound (NoBo) hikers following the white blaze exit the 100 Mile Wilderness, walk a short distance east on the Golden Road, cross the trucking bridge spanning the West Branch of the Penobsot River and usually stop to purchase a few items at the privately run Abol Bridge store before hiking further east to get back on the white blazed trail and head into the Park. Crossing a footbridge over Abol Stream with unobstructed views of Katahdin, they encounter a sign denoting the Park boundary. About 100 yards further, they find a kiosk with A.T. information and a self-explanatory sign-up sheet for AT hikers staying overnight at the Birches Distance Hiker site. From mid-July to late...
October an A.T. Steward is contracted by the Park and typically greets everyone passing by this location. (See enclosed Map)

Baxter Park has maintained consistent statistics for several decades on the use of the Park by AT hikers. The AT has seen significant and steady increases in use since the 1970’s. In 2013, total number of thru hikers and section hikers using the AT in Baxter was 1,862 or approximately 3% of our total Park visitation of 63,474 individuals. (See enclosed charts showing cumulative totals)

In 1962, Percival Baxter purchased the final acreage he would buy in creating Baxter State Park. In 1997, the Baxter State Park Authority, using money from Park trust funds, purchased lands along the West Branch of the Penobscot, including the section of the AT corridor on which the AT information kiosk sits. Today, the A.T. continues to grow in popularity while Baxter State Park has also experienced many changes in visitation and operational policies since the 1930’s. When Earl Schaffer first thru-hiked the A.T. access to the trail, camping equipment, availability of accommodations and communication technology were all very different. The Park has consistently supported the management of Katahdin as the northern terminus of the AT in a positive and responsive manner while still remaining true to our mission and responsibilities.

Although the Appalachian Trail is not a designated commitment in our Trust mission, we have enjoyed a long relationship with Appalachian Trail hikers, and the managers of the AT the ATC and the NPS. Over the years, we have implemented a number of policy, structural and administrative functions in order to effectively accommodate the somewhat unique needs of AT hikers entering Baxter Park. Some of the ways we meet the needs of the impact of AT hikers on the Park are listed below:

- The Park provides **The Birches camping site**: 12 spots saved for distance hikers on a sign-up basis. This is the only situation in which campsites are available in BSP without prior reservation.
- The Park funds a **15-week position** stationed near Abol Bridge and dedicated solely to greeting AT thru hikers and authorized to assist hikers by obtaining advance reservations in public campgrounds when The Birches is full or for hikers who want to join family members. Park support of this position includes salary, housing, uniform and radio issue.
- The Park maintains an **information kiosk** built and located to provided information for distance hikers along the AT Corridor on the West Branch Lands
- Park Information & Education staff provide **annual training on BSP policies for all MATC ridgerunners**.
- The Park produces and distributes an **informational brochure** developed specific to Distance Hikers visiting BSP
- The Park provides **Website info posted** for Distance Hikers and relays updated information to ATC Harper’s Ferry

Ron Tipton & Wendy Janssen, AT Conservancy Letter
November 18, 2014
Page 2 of 9 (including enclosures)
• The Park provides a “One Pager” developed and mailed to NH and ME hostels and other info outlets each season to provide up to date information on prices, policies and camping and hiking in Baxter Park.

• **Extensive and ongoing radio communications** pertaining to AT hikers July – October, including assisting with arranging pickups, informing family, obtaining campsites, etc.

• The Park maintains consistent **AT use statistics regarding** numbers of SoBo/NoBo thru hikers, SoBo,NoBo section hikers, flip floppers, number of AT distance hikers camping in Birches, etc.

• Attendance when feasible to **MATC/ATC sponsored agency partner events**

• **One year round supervisory field ranger + one year round administrative staff are tasked with liaison duties for this user group.**

---

**Current Issues**

While there are refreshing exceptions (including the former thru hikers we hire as AT Stewards!), most staff would agree that as a group, AT hikers require special attention and resources in order for us to uphold the Park mission. **The AT model seems to be based on unlimited growth in use while BSP operates under a fixed capacity model.** For instance, 2012 was the first season more than 700 NoBo hikers finished the trail; in 2014 Katahdin Stream registered 901 NoBo thru hikers (May-October 2014). It seems likely the numbers of AT hikers is poised to increase in upcoming seasons due to increasing popularity with college age hikers and greater exposure in mainstream and social media.

2014 has posted records numbers of AT hikers entering the Park during our busiest summer period. We have serious concerns about the impacts of a significant increase in AT hikers. The culture and attitude of many AT hikers seems to be changing. Some of the trends we have observed in recent years include:

• **AT hikers are open and deliberate in their desire for freedom from all rules and regulations** during their thru hike but fulfilling our Park mission at times involves the use of some regulations. The regulations/policies most often questioned or violated by AT hikers:
  - $10/night camping fee at the Birches
  - Camping permitted only in designated sites in Baxter
  - No pets allowed within BSP
  - No public drinking of alcohol (summit of Katahdin)
  - 12 person camping limit at the Birches

• Modern AT hikers exhibit a **desire to travel together in large numbers**, congregating on the trail in large groups even as the Park has recently joined all other land management agencies in the Northeast in limiting hiking group size beginning in 2013 (in BSP: 12 people or less/group). Despite extensive I & E tools and staff efforts to explain the origin and purpose of the Park to this visitor group, distance hikers increasingly view the AT corridor in the Park as a means
to an end and the summit of Katahdin as a backdrop to their human achievement.

- Complaints from Park hikers and concern from BSP staff about loud parties and disrespectful **drinking of alcohol and use of recreational drugs in full view at the summit**. This behavior detracts from the summit experience for other hikers on Katahdin, including families with children. The inconsiderate behavior does not represent use the Park supports or encourages anywhere in the Park, let alone at Maine’s most popular peak with the highest visitation.

- A surprisingly **large increase in hikers arriving with service dogs**. A quick search on the internet turns up at least 6 companies on the web offering fake service dog credentials and accessories available for a fee. Following their hike in the park, hikers have been seen hiking able-bodied, without dogs, boasting and laughing loudly in local establishments about how they “pulled one over on Baxter” by showing fake credentials, etc. Two hikers (one AT hiker “Skippy”) claiming to have service animals were issued a summons by BSP Rangers for having a pet in the Park. These individuals were falsely representing their dogs as service animals. Both individuals were convicted and assessed a $260 fine.

- An **increase in SoBo’s** many of whom say they are avoiding the crowd scene and overdone “trail magic” on the south end of the trail in the spring. Increasing numbers of SoBo’s who choose not to avail themselves of excellent information provided by ATC, guide books, websites, etc. but simply show up spontaneously to begin their hike, requiring significant staff time and guidance to successfully summit Katahdin and reach the 100 Mile Wilderness. Unlike the southern terminus of the AT, SoBo’s that manage to complete a Katahdin climb exit the Park directly into the 100-mile wilderness with minimal support or options for dispensing of surplus gear. (See enclosed statistics on SoBo’s over the years)

- In 2014 we had 20 (or more) NoBo hikers enter the Park at once, via the kiosk on 10 different days. Groups of 20-45 hikers would arrive together, insisting they want to summit together despite our group day hike regulation and requests they not monopolize the summit. Hikers increasingly mention an intention to “break records” for the number of AT hikers at the summit.

- A **large increase in number of thru hikers wishing to hike “up and over”**. This phrase refers to AT hikers who, after reaching Baxter Peak and the terminus of the AT, leave the white blaze and continue to hike east and complete their day at Roaring Brook Campground. Coupled with this hike is an expectation that Park staff will undertake numerous radio calls to arrange for taxi or shuttle service on the other side of the mountain at day’s end. Some thru hikers have indicated they will petition to have the white blaze formally extended to include Knife Edge and trails on the Chimney side of the mountain.

Ron Tipton & Wendy Janssen, AT Conservancy Letter
November 19, 2014
Page 4 of 9 (including enclosures)
• **Increase in number of hikers arriving late in the afternoon** when the AT Steward may be done for the day, saying they plan on hiking 10 miles before nightfall but some actually plan to camp illegally on the West Branch Lands, rather than camping at the provided Maine DOC site at the edge of the Park (honor system payment).

• **A continued problem of friends/families of finishing thru hikers expecting to reserve public rental sites on weekends.** Weekends are when demand for Park sites is highest. The Birches was established incoming thru hikers, not families/friends of hikers. We always do our best but in the success of online reservations means increasingly fewer sites will be available on short notice.

• **Increased confusion regarding available overnight space** for thru hikers plus family because, despite clear instructions posted, the “no reservation-signup” option we offer at The Birches is interpreted to indicate unlimited tolerance and space for however many hikers show up on any night.

• Between arranging for shuttles, rides, meetings, and administering lodging at the Birches, more **radio traffic/time** on the Park’s two-way radio system is devoted to serving the needs of this group than any other user group in Baxter State Park.

• In recent years the “tagging” of Park facilities and natural features by AT hikers has emerged, requiring maintenance effort from Park staff.

### Conclusions

The text above is not meant to serve as a litany of complaints, but it is meant to serve to document the significant effort put forth by Baxter State Park to serve a user group not defined in our trust mission, but with a clear historical connection to wild lands and the rejuvenating power of hiking on the landscape. It is also important to document the concerns we have regarding emerging trends and behaviors in this group may conflict with Park users and require yet more staff effort in the years ahead.

**Of principal concern to us is the conflict between the management models of Baxter State Park and the ATC.** The Trust communications of the Park clearly direct that the provision of recreational opportunities is of secondary importance in respect to the protection of the natural resources of the Park resources. We have limited daily access to Katahdin trailheads for 25 years. We apply these limits in the spirit of protecting the fragile alpine habitat on Katahdin from overuse and to provide a sustainable level of human impact and social experience in one of the most popular and iconic mountains in the northeast.

The efforts of the ATC seem to be oriented toward a continuing increase in the number of hikers on the long, narrow natural resource of the AT. Films and documentaries in planning for 2015 seem likely to spur even more use of the
Appalachian Trail. A review of the AT planning and management documents\(^1\) does not indicate a consideration of sustainable use.

From the perspective of Baxter Park, we are concerned that the use of the AT within Baxter Park is nearing, or may have surpassed, an acceptable limit for the facilities and effort available from the Park to accommodate AT hikers. In addition, we are concerned about the impact on the wilderness experience for Park visitors on Katahdin if current trends continue. We do not plan on expanding lodging availability or staffing effort for AT hikers in Baxter Park. We are concerned that any significant increase will strain the current system beyond its capacity.

Options to address these concerns would require a commitment to sustainable use of the AT and preserving the wild experience along the trail. Permit systems are in place on other popular long-distance trails in the U.S. Relocating key trail portions or the trail terminus would another option.

I understand that the management of the complex natural and social resource that is the AT is complex and demanding. I want to thank you for your attention to our concerns regarding the complex management of this important natural resource. We sincerely hope you can find time to meet with us this winter to discuss our concerns and consider options for the future.

Sincerely,

\[\text{Jensen Bissell}\]
Director, Baxter State Park

Enclosures

Pc: Hawk Metheny, Baxter State Park Authority Members


Ron Tipton & Wendy Janssen, AT Conservancy Letter
November 19, 2014
Page 6 of 9 (including enclosures)
# Long Distance Hikers Registered at Baxter State Park

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BIOGRAPHY OF THE AUTHOR

Leah Beck was raised in Marion, Iowa and graduated from Linn-Mar High School in 2010. After high school Leah attended Iowa State University and graduated in 2014 with a Bachelor’s of Science double majoring in Biology and Environmental Science. By the end of her undergraduate degree she had a unrelenting desire to work in the outdoors; which she did for a little over two years on various trail crews all over the United States. Leah met her now advisor at the University of Maine on a trail she was constructing in 2015 when he brought one of his classes out for a field trip. Leah visited UMaine shortly after and the rest is history. After receiving her degree, Leah will be moving to Arkansas to work with The Nature Conservancy as their Recreational Trails Specialist. Leah is a candidate for the Master of Science degree in Forest Resources from The University of Maine in May 2020.