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RPTM 320 - Lit Review

High Use Trail Impact Effects and the Appalachian Trail Bubble

The main goal of all recreation resource managers is to balance the needs of the environment with those of the users. There is a plethora of research pointing to high use having a negative effect on both trails themselves and the users. Both sides of this delicate balance can be compromised when severe overcrowding takes place. This severe overcrowding is most disgustingly seen in a yearly phenomenon known as the Appalachian Trail Bubble, where hoards of thru-hikers starting at the same place and time move their way North. There is not yet any research surrounding this Bubble and its effects on both the Appalachian Trail and its hikers, but a focus on this topic could produce managerial and user insight that would benefit both sides of the balance. The trail would be less affected by overcrowding and it's hikers would experience more satisfaction if effort was made for thru-hikers to hike outside of the Bubble.

The Appalachian Trail is a long distance hiking trail that runs from Mt. Springer in Georgia up to Mt. Katahdin in Maine, stretching 2,180 miles. Every year hundreds of hikers attempt to thru-hike the trail, some going North and some going South. The most popular direction is North, so because of weather, most Northbound hikers (NOBOs) start in March or early April. The result of this is a clog of thru-hikers that moves slowly north, bringing with it noise and trail damage. This damage comes because the number of hikers surpass the carrying

capacity of the trail, which is defined as "the ultimate limits to growth as constrained by environmental factors" (Manning, 2011, p. 81). When carrying capacity is surpassed, the crowding is extreme, which, also according to Manning, is "some level of visitor use beyond which the quality of the outdoor recreation experience is diminished to an unacceptable degree" (Manning, 2011, p. 98). High-impact issues on trails are not uncommon, but to this extreme it is a new issue due to the very recent boom in thru-hiker numbers. According to the Appalachian Trail Conservatory, thru-hiker numbers jumped from 1,460 to 3,377 from 2010-2016 (http://www.appalachiantrail.org/). In just six years the number of NOBO thru-hikers attempting the AT has more than doubled. The Bubble is bigger and more threatening than ever before.

Normal daily use, boots stomping on the trail, is the cause of notable trail deterioration simply because of the large numbers of boots travelling over it. Common problems include trail widening as well as soil compaction. In his article on "Hiking Boot Impacts on Woodland Trails" Fred Kuss explains that "because compaction reduces total pore space, infiltration and percolation may be greatly reduced, which will increase runoff and the potential for erosion" (Kuss, 1983, p. 119). Without the installation of water bars to facilitate drainage, any precipitation will bring with it run off in the form of soil loss. Soil loss on trails can be detrimental, as is explained in Nathaniel D. Olive and Jeffery L. Marion's article, The Influence of Use-Related, Environmental, and Managerial Factors on Soil Loss from Recreational Trails. In this article, they explain how "trail erosion, in particular, is a significant management concern because it is irreversible without costly management actions that may further impact resources or increase the development and artificiality of recreation settings". They go on to explain that "when substantial, trail erosion can degrade visitor experiences and create difficult or unsafe

travel conditions" (Olive & Marion, 2009). With record high numbers starting at Mt. Springer, the foot traffic over the Appalachian Trail is certainly "substantial", especially during the Bubble. This article makes the clear connection between high use and soil loss on trails for the purpose of providing managers suggestions to minimize erosion.

Two types of management action are prevalent in issues such as this one; direct and Indirect. "Direct management practices act directly on visitor behavior" (Manning, 2011, p. 274) which removes visitors' freedom, for example closing down a camping area to let vegetation grow back. Conversely, "indirect management practices attempt to influence the decision factors upon which visitors base their behavior" (Manning, 2011, p. 275) for example holding weekly free Leave No Trace clinics for hikers. When trail erosion and soil loss get to a minimum acceptable condition, management actions must be taken.

In a study conducted by Melissa Daniels and Jeffrey Marion direct management actions were taken in a high-use Appalachian Trail campsite area, and user evaluations of this action were analyzed. To prevent further vegetation loss and area damage, site managers built established campsites into the area. This direct management can come with some turbulence, since "visitors may not perceive environmental impacts the same way as managers do" (Daniels & Marion, 2006). Visitors may wonder how construction work in the woods is going to save the environment, and they may get frustrated that their freedom of where they can camp is restricted. Despite this, when it was all said and done "all environmental and social indicators had higher posttreatment satisfaction values" (Daniels & Marion, 2006). A more natural and healthy environmental experience made the direct action worth it for most users. This study highlights the desired balance between use and conservation, social and environmental goals, the dual

mandate. Direct management action may be the answer for the Appalachian Trail's Bubble problem, but perhaps a first step could be indirect management including education on the issue of crowding.

A reassuring level of hiker competence was shown in a study on minimum impact knowledge conducted by Newman, Manning, Bacon, Graefe, and Kyle, 2003. The study was mainly conducted as a baseline, so that it could be compared to numbers taken in the future. An additional goal of the study was to see what hikers did and did not know, because managers "may wish to emphasize topics that are less well understood by visitors" (Newman, Manning, Bacon, Graefe, Kyle, 2003, p. 37) while implementing indirect management solutions. If it turned out that users knew nothing about minimum impact strategies, then managers would know how to tackle their erosion issues. The article points out that "information and education programs represent an attractive management alternative that can potentially reduce the ecological and social impacts of recreation while maintaining visitor freedom of choice" (Newman et al., 2003, p. 38). While the knowledge level from this study turned out to be promising, with an average of 82% on the self administered survey, it helped to make clear that perhaps the issue with the Appalachian Trail's Bubble is not an education issue about minimum impact tactics but rather on crowding. Management is definitely needed to combat this.

The Appalachian Trail Conservatory is making beginning efforts at indirect management action to educate users about the crowding issue. As previously mentioned, there is no formal research on this Bubble topic yet. The most credible information on the subject I found on the Appalachian Trail Conservatory's website. They recommend a thru-hiking tactic called "flip flopping" which involves starting in the middle of the trail, hiking to one terminus, then going

back to the middle and hiking to the other terminus. As stated on the website, “there are almost an infinite number of ways to construct a flip flop thru-hike” (http://www.appalachiantrail.org/home/explore-the-trail/thru-hiking/alternative). The benefits of flip flopping include avoiding the party crowd, hiking in optimal weather, and perhaps most importantly saving the trail from the stress of crowding. Based on studies on satisfaction, this method would help users to have a better experience on their thru-hike.

In a study by Natasha Lynn and Robert Brown, the effect of use impacts on the hiking experience was examined. In their article they mention background information from a study by Kliskey and Kearsley that explains “four principal elements or properties of wilderness perception are held: 1. aspects of forest and vegetation (that is, naturalness); 2. solitude; 3. absence of human impact (that is, artifactualism); and 4. isolation or remoteness.” (Kliskey and Kearsley, 1993, 211). Lynn and Brown use these dimensions were in their study to evaluate users’ satisfaction. They reported that “all of the experience dimensions contributed greatly to the respondents’ overall satisfaction”, and further “recreational use impacts have the potential to negatively affect the quality of visitor experiences” (Lynn & Brown, 2003). If the crowding effects of the Appalachian Trail’s Bubble will damage both the health of the trail but also the experience of the user, it is definitely in everyone’s best interest for management action to be made.

The Appalachian Trail Conservatory has the right idea with the flip flop thru-hike. Based on the study by Newman, Manning, Bacon, Graefe, and Kyle it is clear that a lack of knowledge about high use impacts is not the issue. Additionally, looking at the studies by Kuss as well as Olive and Marion, the finger points to a simpler, more innocent, crowding issue. Through

indirect management practices involving education about the alternatives to the traditional NOBO thru-hike, hopefully the detrimental crowding effects of the Appalachian Trail Bubble can be reduced. If hikers are willing to accept this education, they will not only increase their satisfaction on their thru-hike but also benefit the vitality of the trail itself.

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