

Claire Leah Model

English 101

Professor Else

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## How Does Outdoor Recreation Affect the Environment?:

### An Annotated Bibliography

Every day, millions of outdoor enthusiasts will unknowingly have an impact on climate change, pollution, and the lay of the landscape as we know it today. Whether we are out on a hike, mountain biking, skiing, sailing, or just lying on the beach, our actions have an environmental impact. My experience as a mountain biker and a climber has shown me that we can negatively impact the environment through the hobbies that connect us to nature. Unfortunately, we are mostly unaware of the harm we are doing, because it is done indirectly through our carbon footprint, including equipment that is not re-usable or recyclable or garments that use toxic, non-biodegradable materials. Honestly, through all my years as a cyclist, I could never find an easily accessible place to recycle my flat inner tubes or broken mechanical components. Shouldn't the outdoor industry have a solution for this? I wanted to discover what research has been done on this important topic; therefore, my question is: How does outdoor recreation impact the environment and what can be done about it?

To date, I have discovered several scholarly articles discussing the direct and indirect impact of outdoor recreation on the environment. The majority of my research indicates that the solution lies in the hands of the outdoor industry and the education of the outdoor enthusiasts.

One article pointed out that climate change is also a contributing factor in how much damage is being done to the environment. On the one hand, damage is done directly due to longer recreational seasons, which leads to more “wear and tear;” on the other, damage is done indirectly due to rising temperatures, which results in, for example, skiers having to travel farther into the wilderness to go skiing. One question I would like to investigate further is to what extent recreational equipment is recycled and how much of it ends up being burned or buried in a landfill. As a cyclist, knowing whether or not inner tubes, carbon fiber, or other components of my bikes are being recycled influences what I purchase. For example, I purchase tubeless tires and aluminum frames, because I know the challenges of trying to find a source to recycle inner tubes and carbon fiber components. On a larger scale, I feel that it is everyone’s responsibility to know and understand how their hobbies impact the environment. Knowing how your actions impact the environment is important, because when it comes to protecting the planet, if we’re not a part of the solution, then there’s a good chance that we are a part of the problem.

Burgin, Shelley and Nigel Hardiman. "Is the Evolving Sport of Mountain Biking Compatible with Fauna Conservation in National Parks?" *Australian Zoologist*, vol. 36, no. 2, Aug. 2012, pp. 201-208. *Environment Complete*, doi:10.7882/AZ.2012.016.

This article discusses the impact of adventure sports on the environment and how these extreme sports focus less on appreciation of the natural environment and more on excitement and calculated risk. Burgin and Hardiman of Bond University in Australia and Kent University in the UK assert that, without proper management, the outcome will be degradation of natural areas and an impact to the local fauna for which the author states, “The immediate response of

individual animals to recreational disturbance is usually either death or behavioral change.” As a mountain biker, I share the authors’ concerns for the local fauna and agree with their claim that the popularity of these adventure sports will suffer if nothing is done to correct the problem.

I plan to use this article as a secondary source for my research, as it is a reliable source with extensive references. The article was published in 2012, recent enough to reflect the current status of the issue it discusses. I will use this article to address the impact adventure sports have on the environment and to show the importance of educating adventure sport enthusiasts about what they can do to help reduce harm to the environment.

Hjerpe, Evan E. "Outdoor Recreation as a Sustainable Export Industry: A Case Study of the Boundary Waters Wilderness." *Ecological Economics*, vol. 146, Apr. 2018, pp. 60-68. *Science Direct*, doi:10.1016/j.ecolecon.2017.10.001.

This research article reports on an economic impact analysis of the Boundary Waters Canoe Area Wilderness (BWCAW) in northeastern Minnesota, a heavily-visited U.S. wilderness area. The author asserts that the “estimated economic impacts of outdoor recreation and their sustainability can be helpful for informing regional economic development policy for conservation areas world-wide,” and that the BWCAW is a good example of “an ecosystem managed primarily for conservation values that also has a substantial regional economic impact.” This is important to my research, because I would like to demonstrate that, even in high-use areas, recreation can be enjoyed in a sustainable, less impactful manner. As a case study, this article is an example of primary research; the statistics provided are unbiased and can add scientific weight to my arguments.

Irland, Lloyd C., et al. "Assessing Socioeconomic Impacts of Climate Change on US Forests, Wood-Product Markets, and Forest Recreation." *BioScience*, vol. 51, no. 9, 2001, p. 753., doi:10.1641/0006-3568(2001)051[0753:asiocc]2.0.co;2.

Irland, et al. review existing studies on the impact of climate change on both the timber and other wood-dependent industries and forest recreation industries. In the case of outdoor recreation, the authors analyze recent research on the impact of climate change by considering a case study on downhill skiing. These findings are relevant to my research, because they illustrate how climate change is affecting what areas are used for outdoor recreation and the resulting socioeconomic impact. According to the article, a good example of these effects is "the extension, because of temperature increases, of the recreation season for a number of activities, especially water sports and beach-oriented recreation" (754). Longer seasons or change of use due to climate change will also proportionately change the amount and type of impact these activities will have.

The authors use scientific evidence to demonstrate how climate change is shifting where and how certain areas are being affected by outdoor recreation. I suspect that changes in land use and the extension of recreation seasons due to the change in weather patterns are causing more environmental and economic impact to these recreational areas. This means that new research should be done, and measures may need to be taken in these areas to assess and minimize the repercussions. I am also trying to discover how these changes may lead to a larger carbon footprint. In the case of skiing, for example, warmer temperatures can lead to having to travel further to other areas. This results in higher levels of pollution from fossil fuels and is an indirect environmental impact of outdoor recreation.

Kaminski, Isabella. "How the Boom in Climbing, Biking and Sailing Is Costing the Earth."

*Ecologist*, vol. 40, no. 26, Aug. 2011, pp. 3-5. *GreenFILE*,

[search.ebscohost.com/login.aspx?direct=true&db=8gh&AN=70276032&site=ehost-live](http://search.ebscohost.com/login.aspx?direct=true&db=8gh&AN=70276032&site=ehost-live).

This article discusses the ecological impacts of such outdoor sports as cycling, hiking, and sailing, and how these activities require the use of many man-made materials that are toxic, organic pollutants, and non-biodegradable. The author points out that while outdoor recreation usually has a very localized impact and that these effects are sometimes very well managed by outdoor organizations, the bigger problem lies in the global impact of the creation, use, and remains of materials such as bicycle tires, surfboards, shoe soles, and Gore-Tex.

Kaminski's assertion that "outdoor sports are increasingly being linked to environmental problems," reflects what I have seen firsthand when I am outdoors or shopping for gear necessary for the next adventure. This article is not peer-reviewed, and therefore, the information is potentially biased. I believe that the outdoor industry should be tasked with creating and using materials that are environmentally friendly while also leading the way to finding solutions that protect the environment and educate people on how to lessen the impact of their outdoor recreation.

Reid, Scott. "From Dog Waste to Daisy Pickers: 'Leave No Trace' Educates Outdoor

Recreators." *Parks & Recreation*, vol. 35, no. 7, July 2000, p. 70. *Environment Complete*,

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Reid discusses the Leave No Trace (LNT) program, which was initially created to educate outdoor recreationalists on how to minimize their impact on the environment while in the

backcountry and subsequently expanded to address the impact in the “front country,” or urban areas, as well. Reid discusses how the program was developed and evaluated, and what lessons were learned after testing the program’s guidelines in the natural world. Finally, he discusses the other organizations that were involved in fine-tuning the program so that it would be accepted by the public. The article was published by the National Recreation and Parks Association, which, according to the NRPA’s website, is “a leading non-profit organization dedicated to the advancement of public parks, recreation and conservation.” This article will help me discover what types of programs have been used in the past and present and what issues provoked their development.

The author claims that “polluted waters, eroded trails, scarred trees, harassed wildlife, and damaged cultural resources will be our legacy if we fail to recognize the individual and cumulative impacts of our enjoyment of public land.” The fact that programs like these exist is proof that outdoor recreation does have an impact on the environment. I would like to use this article to show how they are necessary and to explore how successful or limited these programs have been.

Simon, Gregory L., and Peter S. Alagona. "Beyond Leave No Trace." *Ethics, Place & Environment: A Journal of Philosophy & Geography*, vol. 12, no. 1, Apr. 2009, pp. 17-34, [www.tandfonline.com/doi/abs/10.1080/13668790902753021](http://www.tandfonline.com/doi/abs/10.1080/13668790902753021).

This article discusses the need to move beyond the principles of Leave No Trace and proposes “a new model that rejects the hierarchical construction of recreationists as passive ethical subjects and consumers.” Appropriately, this proposal has been named “Beyond Leave No Trace.” The article discusses the history and current implementation of the Leave No Trace

principles in the U.S. and globally, and concludes by suggesting a new framework for building on the success of Leave No Trace, demonstrating the need to educate outdoor enthusiasts on leaving their recreation spaces looking pristine and untouched for other users to enjoy after them. I strongly believe that outdoor recreation has a major impact on the environment, and the only way to reduce that impact is through education and respect for where we play. Simon is affiliated with Stanford University in California and Alagona is affiliated with the University of California in Santa Barbara. The article was published in 2009, so I will want to explore whether or not this proposal has had an impact on the Leave No Trace program. This information will contribute to the conclusion of my research essay.