




2015

Using choice experiment valuation methods to measure public preference for a new national park in Maine

Alexander G. Wilsterman
Colby College, agwilste@colby.edu

Follow this and additional works at: <https://digitalcommons.colby.edu/jerec>

 Part of the [Agricultural and Resource Economics Commons](#), [Agricultural Economics Commons](#), [Biodiversity Commons](#), [Economics Commons](#), [Environmental Health Commons](#), [Forest Management Commons](#), [Natural Resource Economics Commons](#), [Natural Resources and Conservation Commons](#), [Oil, Gas, and Energy Commons](#), [Sustainability Commons](#), and the [Water Resource Management Commons](#)

Recommended Citation

Wilsterman, Alexander G. (2015) "Using choice experiment valuation methods to measure public preference for a new national park in Maine," *Journal of Environmental and Resource Economics at Colby*. Vol. 2 : Iss. 1 , Article 13.
Available at: <https://digitalcommons.colby.edu/jerec/vol2/iss1/13>

This Article is brought to you for free and open access by Digital Commons @ Colby. It has been accepted for inclusion in Journal of Environmental and Resource Economics at Colby by an authorized editor of Digital Commons @ Colby.

Using choice experiment valuation methods to measure public preference for a new national park in Maine

THIS ARTICLE IS IN DRAFT FORM

Introduction:

The history of national parks in the United States dates back to 1872 when congress established Yellowstone Park. The two million acre park was a world first for land conservation by governments. It wasn't until forty years later, in 1916, that President Woodrow Wilson signed into creation the National Parks Service (NPS)(Sellars, 1997). Since then 58 other areas of land across the United States have been put under the protection of the National Parks Service and been named "national parks", servicing millions of visitors annually.

Maine is currently home to one national park, Acadia, which receives around two million visitors each year (Service, 2015). This park is crucial to Maine's economy as tourism is Maine's largest industry, accounting for ten percent of total jobs and about seven percent of annual GDP (Manning & Daigle, 2007). Additionally, Maine is the oldest state in the country and in 2013 it ranked in the bottom ten states in relation to annual growth (Murphy, 2014). Because of this, Maine must look to further embrace their nickname "Vacationland" and find new ways and attractions to draw more tourists into the state. A new national park in Maine adjacent to the already existing Baxter State Park has the potential to revitalize economies in the Midwestern areas of the state which have seen many jobs disappear due to technological advances in timber harvesting and mill operation. The park would create jobs related directly to the tourism industry such as lodging, and adventure guides, but due to the multiplier effect, jobs catering to these new jobs would also be created. These would be jobs in such industries as construction, health care, and education.

The proposed Katahdan Woods & Waters National Park is located directly adjacent to the right of Baxter State Park. The park consists of two 75,000-acre areas. One section will be allocated for recreational activities while the other will accommodate the naturalists and be more restrictive in relation to what will be permitted. The area of the park contains habitat for moose, black bear, brook trout as well as multiple endangered species such as the Canada lynx. Additionally, the land encompasses about 25 miles of the East Branch of the Penobscot River that is classified in Maine as a AA river with outstanding natural resources. This is the highest rating a Maine river can receive. While there already is a park located in this area, the notoriety of a national park would bring in more visitors and have a larger impact on the local economy than if the park were to be classified and managed under state control.

This paper seeks to measure the public opinion of a new national park for U.S. citizens in the northeastern area of the United States excluding Maine.

THIS ARTICLE IS IN DRAFT FORM

THIS ARTICLE IS IN DRAFT FORM

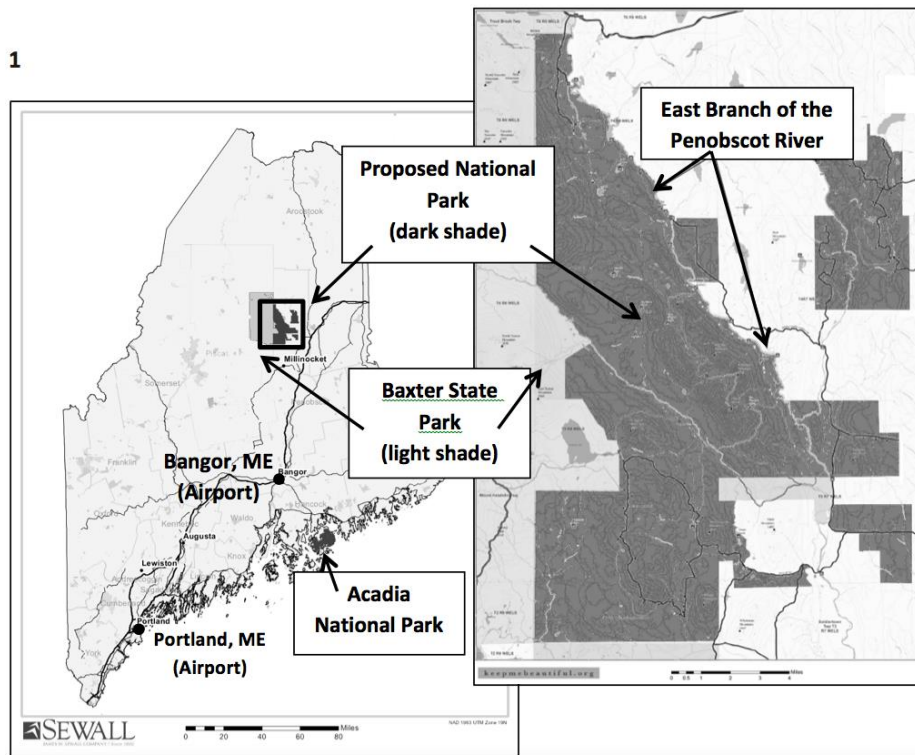


Figure 1 – The proposed Katahdan Woods & Waters National Park area represented by the shaded area.

Literature Review:

In a 2009 article, *The preference analysis for tourist choice of destination: A case study of Taiwan*, Hsu et al. study how information about a location can help to enable a visitor to choose the right park destination for their preferences (Hsu, Tsai, & Wu, 2009). Using an Analytical Hierarchy Process, the researchers were able to predict which attributes tourists had a greater preference for. AHP uses mathematics and psychology to organizing and analyze complex decisions. The researchers additionally found that visitor satisfaction was higher when they were better informed about what attributes different parks had (Hsu et al., 2009). This way they were able to choose the best fit for them. Tourists were willing to travel longer distances if they knew that their destination was worth the trip. This means that publicity and public image of a park is extremely important when attracting visitors.

In a 2002 article, *The use of choice experiments in the analysis of tourist preference for ecotourism development in Costa Rica*, Hearne and Salinas assess which attributes tourists prefer most at ecotourism sights (Hearne & Salinas,

THIS ARTICLE IS IN DRAFT FORM

THIS ARTICLE IS IN DRAFT FORM

2002). The study found that the attribute that tourists cared about most was congestion. More people at an ecotourism sight related to a decrease in visitor experience. Additionally they critiqued their own survey by capping the price range too low. They believe that the survey would have found a higher willingness to pay (WTP) had the price attributes been set higher (Hearne & Salinas, 2002). Additionally, visitors preferred more information about local biodiversity when available, as well as the presence of good viewing spots located in the park.

In a 1998 article, *Ecotourism Demand and Differential Pricing of National Park Access in Costa Rica*, Chase et al. examine how pricing techniques at national parks can help to achieve desired management outcomes (Chase, Lee, Schulze, & Anderson, 1998). Ecotourism is one of Costa Rica's largest industries, and they receive millions of visitors every year to their national parks. As mentioned above, overcrowding is one of the most common tourist complaints; park managers must do their best to spread tourists across all parks so that the more popular ones do not become over crowded. The main strategy used to overcome this issue is called a price "push". A "push" is nothing more than a price increase at a more popular park. By increasing the price, basic supply and demand will tell you that demand decreases for that park making demand increase for the cheaper parks (Chase et al., 1998). The paper also found that WTP for park entrance fees is subject to a downward bias meaning that tourists are actually WTP more to enter a park than they initially say. Therefore the price "push" applied to popular parks will be greater due to this downward bias.

Methods:

In order to measure public opinion on this issue, choice experiment valuation methods were used. Through the use of the choice experiment valuation method, researchers are able to extract preferences for environmental goods. Furthermore, the preference of an environmental good does not just encompass its existence but the characteristics of the good must also be considered. A choice experiment survey will present respondents a collection of questions each with three scenarios for the proposed environmental good from which the respondent will choose their most desired outcome.

The researchers identified four attributes or characteristics that were most relevant to the implementation of the park. These attributes include types of access, types of trails, expected economic impact, and the entrance fee. The first attribute is the type of access, which the survey describes as the types of recreational activities that will be permitted within the park boundaries. The second is the expected economic impact, which is the total contribution to the Maine economy from the National Park from visiting tourists, new jobs being

THIS ARTICLE IS IN DRAFT FORM

THIS ARTICLE IS IN DRAFT FORM

created and local industry surrounding the park. These numbers came from a 2012 Headwaters Economics report on the economic impact of a new national park. The third attribute is the type of trails, which refers to the types of trails that will run through the park boundaries. Different trails will promote/allow different modes of transportation. The last of the attributes is the entrance fee, which begins at \$10 and increased by intervals of ten up to \$60. The attributes and relative levels for the survey instrument are shown in Table 1.





Benefits	Definition
Types of Access 	Types of Access: refers to the types of recreational activities that will be permitted within the park boundaries <ul style="list-style-type: none"> - No Fishing & No Hunting - Fishing but No Hunting - Fishing & Hunting Permitted
Expected Economic Impact 	Expected Economic Impact: refers to the total contribution to the Maine economy from the National Park from visiting tourists, new jobs being created and local industry surrounding the park. <ul style="list-style-type: none"> - 400 New Permanent Jobs (about \$10 million added to the economy) - 800 New Permanent Jobs (about \$20 million added to the economy) - 1200 New Permanent Jobs (about \$30 million added to the economy)
Types of Trails 	Types of Trails: refers to the types of trails that will run through the park boundaries. Different trails will promote/allow different modes of transportation. <ul style="list-style-type: none"> - Only Hiking, Biking, and Cross-Country Skiing - ATV/Snowmobile Access & Hiking/Biking/Cross-Country Skiing
Cost to Households 	Cost to Visitors: refers to the entrance fee to visitors of the new park. Entrance Fee (per vehicle) <ul style="list-style-type: none"> - \$10 - \$20 - \$30 - \$40 - \$50 - \$60

Table 1 – The categories, description, and intervals of each of the characteristics of a park identified and included into the survey.

In addition to the choice experiment questions asked in the survey the respondents were asked to provide demographic information to the researchers in order to better quantify what factors effect the choices of specific respondents. These factors relate to age, income, sex, proximity to the park, etc.

In order to finalize the survey, two focus groups were conducted to make sure the wording was clear and all necessary supplemental information was included. After the survey was finished, it was sent out to 2,500 households in the northeastern region of the United States. In addition to the survey, a pre-paid return envelope was included to promote responses.

THIS ARTICLE IS IN DRAFT FORM

THIS ARTICLE IS IN DRAFT FORM

Demographics:

While the survey was sent out to 2,500 households, after about a month, only 79 had been returned. While not all 79 had the entire demographic section filled out, the choice experiment section was fully completed. Of those who did complete the demographic information data had a wide range of backgrounds that helped to get a more complete picture of our results. As far as education, our returned survey set was compiled of mostly citizens who had completed some form of graduate school with about 45%. Graduate school was followed by persons holding a bachelor's degrees and then high school diplomas. Not surprisingly, the most common income level was greater than \$100,000, which confirms the idea that with more years of education, there is a greater opportunity for a higher level of income. Additionally, the age group with the lowest number of respondents was the 35-50 year age range. This could be attributed to the fact that this age range is when most people are raising children and have little extra time to fill out surveys for college students.

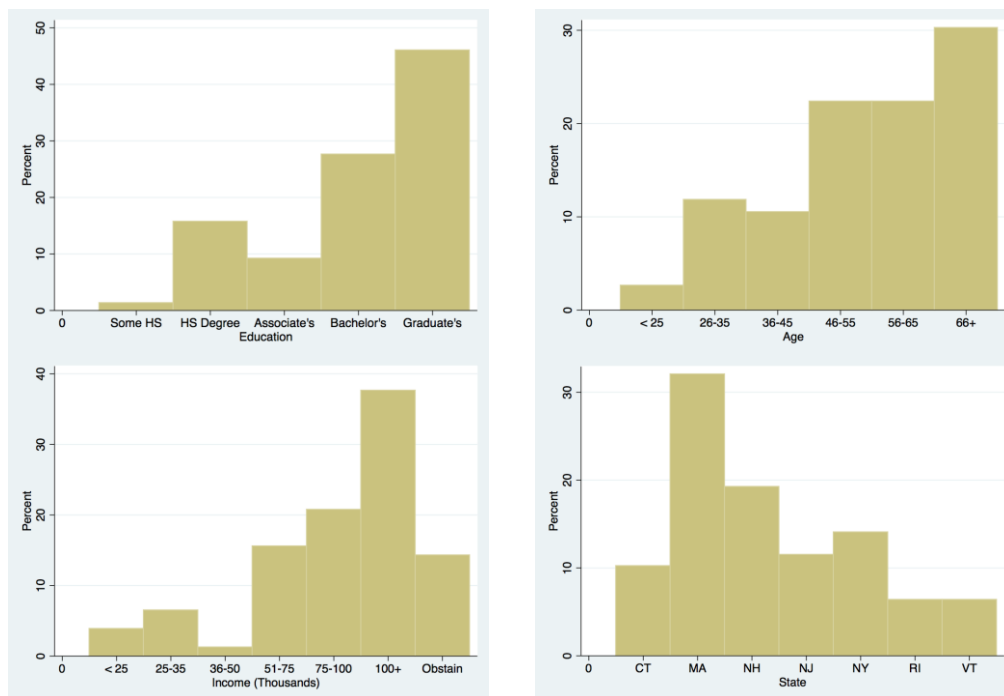


Figure 2, 3, 4, 5 – The demographic breakdown of survey respondents by education, household income, age, and state of residence

When observing the political make-up of the respondent pool, we can see that the majority of respondents we in favor of a larger government role in all

THIS ARTICLE IS IN DRAFT FORM

THIS ARTICLE IS IN DRAFT FORM

three categories the researchers were interested in. The three areas of concern for the researchers was the reduction of poverty, providing access to healthcare, and protecting the environment. The majority of respondents were either in favor of more government or believed that involvement didn't need to change. The one category where there were more respondents in favor of less government influence was access to health care, where the least favorable option was to have the involvement unchanged. Additionally, it was beneficial to the researchers to have the majority of respondents describe their average vacation as nature oriented so as to have a more qualified respondent pool answering the choice experiment survey.

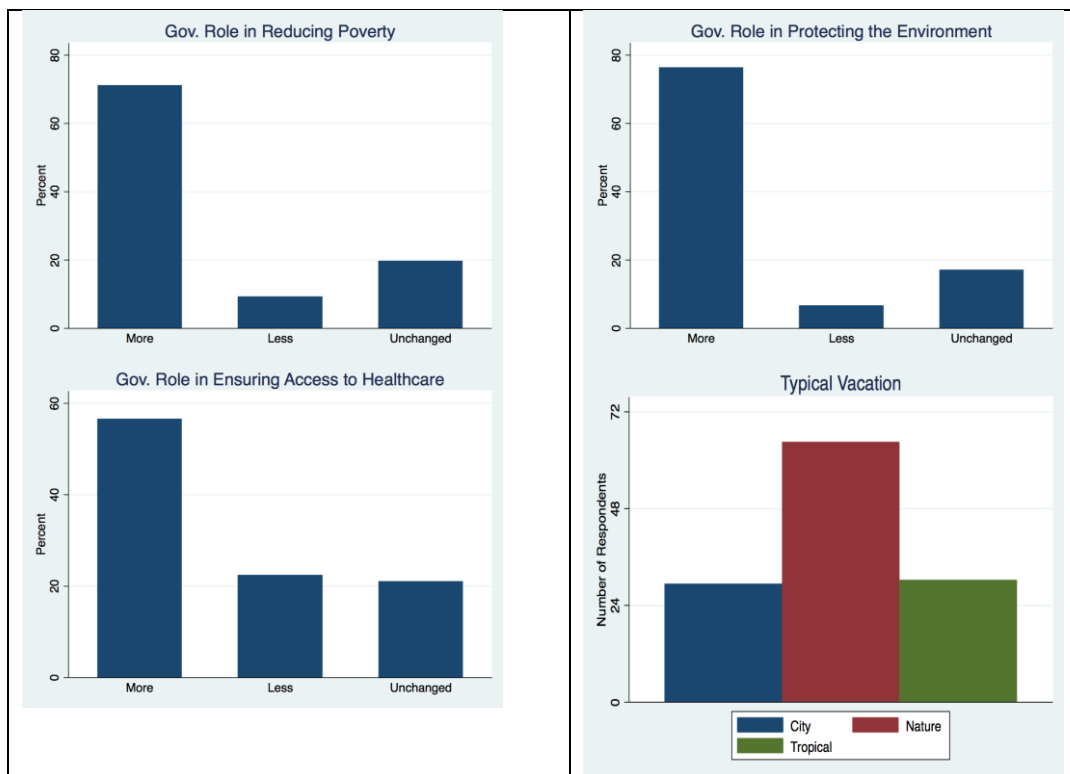


Figure 6, 7, 8, 9 – The survey respondent's opinion of the role of government in such matters as reduction of poverty, providing access to healthcare, and protecting the environment. Additionally, respondents we asked to share the destination of their average vacation.

Analysis:

When the logit and mix-logit models are run using the survey data, there are some interesting points that can be taken from the results. One of the most stunning

THIS ARTICLE IS IN DRAFT FORM

THIS ARTICLE IS IN DRAFT FORM

discoveries shown by the output is that the inclusion on hunting into the park does not show any statistical significance below the 10% level.

VARIABLES	(1) Logit	(2) MxLogit	(3) MxLogit
fishing	0.858*** (0.155)	1.473*** (0.294)	-1.031*** (0.335)
hunting	-0.143 (0.151)	-0.096 (0.278)	-1.477*** (0.314)
trail	-0.271*** (0.095)	-0.384* (0.204)	-1.196*** (0.192)
jobs	0.002*** (0.000)	0.003*** (0.000)	0.001*** (0.000)
fee	-0.023*** (0.003)	-0.040*** (0.009)	-0.047*** (0.010)
Observations	1,659	1,659	1,659

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This is not strange to the researchers because in the survey, there was a special space where respondents could voice their opinions on what they cared about most in the park as to what should and should not be included as characteristics, and the most popular comment was that hunting not be allowed. Therefore, it is not surprising to see that the permission of hunting in the park held no statistical significance. In addition to hunting the other characteristic, which showed to have less statistical significance than the rest, was the trail type. Just as with hunting though, many of the comments left for the researchers reflected an anti-ATV agenda on the part of the respondents due to their noise disturbance and pollution.

When examining these two findings from a more birds eye view it is possible that the reason both of these characteristics were unfavorable to the respondents may be linked to environmental impact. Out of all the options for the choice experiment characteristics, hunting and ATV/snowmobile use would have the largest negative environmental impact on the park during its existence. This would mean that while respondents may be worried about preserving pristine natural areas, they are also weary of the downside to ecotourism and the effects

THIS ARTICLE IS IN DRAFT FORM

THIS ARTICLE IS IN DRAFT FORM

of high traffic areas on their surroundings. This theory is also furthered by the comments left by respondents when asked what concerns they had for the park, to which along with no hunting or ATV use there was also a large portion worried about the local development around the park. Meaning that if the park is already protected today, then the establishment of a national park would create a more developed area near the park and could therefore have a net negative environmental impact on the local ecosystem. Additionally, the survey revealed some predictable although reassuring results. First of all, the data show that a lower park entrance fee is more desired by potential park goers. Furthermore, the larger number of jobs that will be added to the economy the more favorable the park is to respondents.

The researchers have identified two main pathways to undertake if the study was to continue. First of all, because a the debate for a new national park is one that has been happening mostly in Maine, the researchers decided that it would be best to look at the public opinion of the states in driving distance of the national park. This area did not include the state of Maine though. Therefore, it would be beneficial to investigate the characteristics that were favorable to Maine compared to those states in same region. Additionally, there is a large opportunity to identify specific characteristics favorable to certain demographic groups such as age group, level of education, or political stance on government intervention on social issues.

References Cited:

- Chase, L. C., Lee, D. R., Schulze, W. D., & Anderson, D. J. (1998). Ecotourism Demand and Differential Pricing of National Park Access in Costa Rica. *Land Economics*, 74(4), 466-482. doi: 10.2307/3146879
- Hearne, R. R., & Salinas, Z. M. (2002). The use of choice experiments in the analysis of tourist preferences for ecotourism development in Costa Rica. *Journal of Environmental Management*, 65(2), 153-163. doi: <http://dx.doi.org/10.1006/jema.2001.0541>
- Hsu, T.-K., Tsai, Y.-F., & Wu, H.-H. (2009). The preference analysis for tourist choice of destination: A case study of Taiwan. *Tourism Management*, 30(2), 288-297. doi: <http://dx.doi.org/10.1016/j.tourman.2008.07.011>
- Manning, E., & Daigle, J. (2007). Nature-based Tourism in Maine: The State's Role in Promoting a Strong Tourism Industry. *Maine Policy Review*, 16(1), 65-77.
- Murphy, E. D. (2014). Maine's 2013 GDP Growth Among Slowest in Nation. *Portland Press Herald*. <http://www.pressherald.com/2014/06/11/maines-2013-gdp-growth-among-slowest-in-the-nation/>
- Sellers, R. W. (1997). *Preserving Nature in the National Parks: A History with a New Preface and Epilogue*. Connecticut: Yale University Press.
- Service, N. P. (2015). Acadia - Park Statistics. from <http://www.nps.gov/acad/learn/management/statistics.htm>

THIS ARTICLE IS IN DRAFT FORM