

## **The view from a canoe: the complexity of route choice behaviour captured in a stated choice survey.**

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Recent ecological studies have suggested that in a boreal forest setting, impacts from timber harvesting in riparian areas on the aquatic ecology may not be as severe as previously believed (Steedman 2000). One potential consequence of these studies is a reduction in the width of buffering reserves along shorelines in order to access valuable timber supplies in these areas (Hunt & Haider 2004). Across northern Ontario, forests are managed along the principles of multiple-use. As such, they provide an important backdrop for recreational experience of anglers and canoeists who are attracted to water based settings. Therefore a reduction in shoreline reserves may have unintended effects on the social value of these areas. While previous research has shown that logged settings may be conducive to consumptive and motorized recreation, promotion of physically demanding non-consumptive recreation types are best suited to areas segregated from logging (Hunt et al. 2000). The goal of this project was to investigate wilderness canoe trippers' preferences for northern Ontario's boreal forest landscapes using a novel methodology for outdoor recreation research by combining landscape perception research techniques with discrete choice experiments in an innovative study design.

Both the scenic beauty estimation (SBE) method (Daniel & Boster 1976) and stated preference methods (Louviere & Woodworth 1983) are well established in the fields of recreation research and resource management. Visual stimuli have been included as attribute descriptions in stated preference research; either in a single attribute context as in the scenic beauty estimation paradigm, or as digitally calibrated images presenting multiple attributes (e.g. Haider et al. 1998, Arnberger et al. 2007). However, to our knowledge these methods have not been utilized before in the complementary manner to be presented here.

Using an internet survey, respondents were shown several canoe routes, and completed three tasks. First, they learned about the route, which consisted of a series of photographic quality landscape of the shoreline, by rating a total of eight images for one route. Secondly, they choose a camp site from two options at the end of that particular route. Third, after two routes were presented, respondents were asked to select their preferred route. This novel approach allowed us to analyse each task by itself, as well as to build a combined model (Figure 1). The canoe route context improved the ability of the scenic beauty estimates to capture those features of importance to the canoeing experience, while the image rating task improved respondents knowledge of each canoe route, allowing more complex trade-offs to be modelled. As a result, a more complete picture of the perception of the landscape and its effect on preferences for recreation experience was gained. Canoeists appear to be highly affected by the scenic quality of the landscapes along waterways. Preferences for land use attributes presented in the campsite DCE have implications for visitor management along canoe routes managed by the province, while preferences derived from the overall route preference DCE have implications for land use planning and forest management. Of particular interest is the fact that the scene with the minimum Scenic Beauty Estimate (SBE\*) emerged as one of the most important drivers of route preference. Because landscape disturbances are most likely to be considered the least attractive scenery available on a route, the implications for timber harvesting practices are considerable.

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With the availability of detailed forest ecosystem classification and other biophysical data available in a geographic information system (GIS), the scenic beauty models may be used to assess the waterways' potential for inclusion in Ontario's system of protected areas. Of particular potential for this type of land use are areas with upland species such as red pine, white pine and jack pine and areas with the exposed rock characteristic of the Canadian Shield. Areas whose forests remain undisturbed by either fire or timber harvesting are also considered more attractive.

By conveying complex visual and textual information in an engaging manner, we were able to assess the trade off behaviour of a more complex nature than is typical of a traditional paper survey., using a sequentially nested model, campsite attributes were nested into an overall route choice model, providing an indication of the importance of the camping aspect of canoe tripping. Beyond the specific application of the information developed in this study to land use planning in general and forest management in particular, this project also provides some insights into the trade-offs in scenery, camping, land-use sharing, and travel costs that canoeists are willing to make in order to achieve the best possible experience.

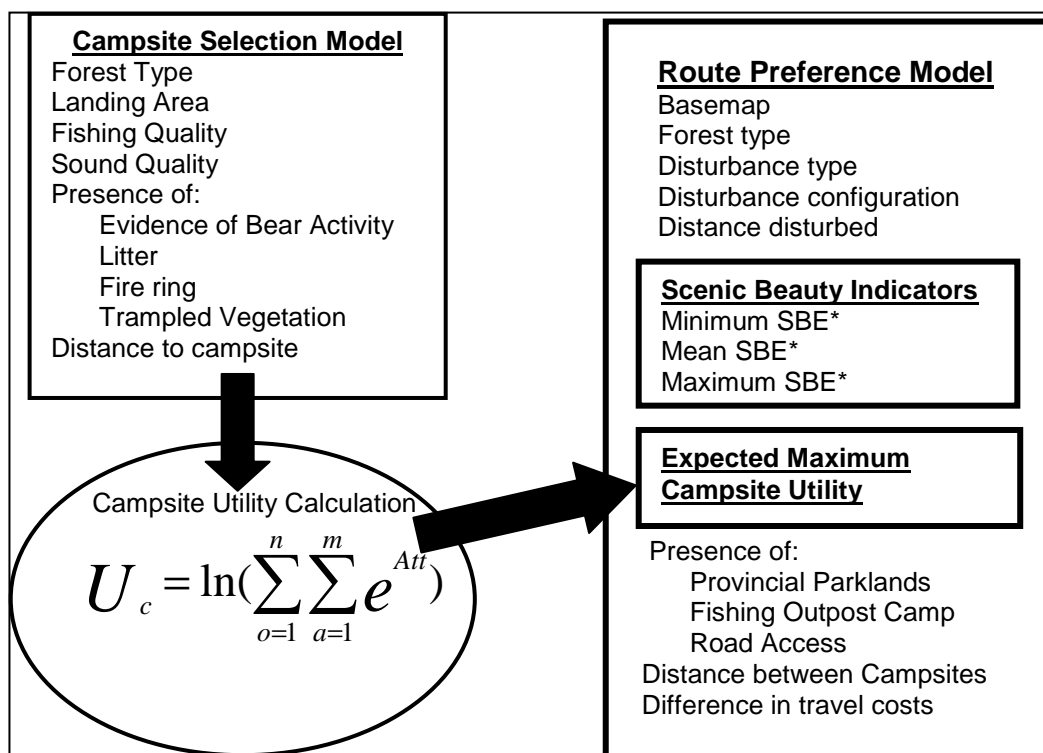


Figure 1: Overall structure of the canoe route stated choice study

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