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3D Computer Visualizations to Incorporate Recreational Use and Values into Forest Management Planning for Ontario Crown Lands

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Introduction

The forests on public (Crown) lands play a major role in the lifestyle of northern Ontario residents, both as a source of jobs and raw materials and as a setting for recreation activities. Many outdoor recreation opportunities rely upon and/or are affected by the access created by resource extraction activities (primarily forestry) on Crown lands. While this recreational access is a significant benefit associated with forestry activities, recreational use is not formally included in forest management planning. Currently there is no formal recreational land-use planning in Ontario, leaving recreation management as a de facto component of forest management planning, largely dealt with through input from public open houses and from Local Citizens Committees (LCCs) selected to represent a range of public views. This situation is problematic as the limited understanding of forestry and recreation interactions, and the reactive rather than proactive role of public involvement, have hindered the effective inclusion of recreation in forest management planning (Lachapelle et al. 2003).

Research on LCCs suggests that the communication methods used to facilitate the exchange of information between managers and the public can form a barrier to effective communication (Robson 2004). Traditionally, public involvement in forest management planning has relied on maps, tables, and graphs to communicate information about future forest conditions under proposed management strategies. Critics of this process suggest that the volume and complexity of the information presented to the public, combined with the lack of time available for interested individuals to acquire a sufficient level of expertise to understand the information, limits the effectiveness of public involvement (Meitner et al. 2003).

Meaningful participation in forest management planning requires tools and techniques that will foster a more thorough comprehension of what forest management alternatives will mean to people who value the land being managed. Three-dimensional computerized visualization is a means of representing complex data and ideas that simplifies the communication of information to people who may not otherwise be able to perceive the implications of particular management actions or understand the concepts involved (Meitner et al. 2003). However, despite considerable anecdotal evidence of the benefits of visualization, there has been limited experimental research comparing the effectiveness of traditional media and computerized visualizations (Lewis & Sheppard 2005).

Methods

This project involves an experimental comparison of the effectiveness of computerized visualizations versus communication media traditionally used in forest management planning (i.e. maps, tables). The ability of people to interact with computerized visualizations is limited by the time and computer resources required to create visualizations for all parts of the land-base. In essence, the optimal tradeoff between the level of detail shown in visualizations and the time required to create the visualizations needs to be established through extensive testing of visualization tools with various audiences. The first phase of the project includes the development of automated visualization processes, coupled with the identification of specific valued places which are the highest priority areas for visualizations. The visualizations used in the project are refined in a two-stage process involving input from: a) a panel of experts in forest management and visualizations to provide guidance on technical aspects such accurately representing forest inventory data; and b) LCC members who comment on the usefulness of different viewpoints, animations, etc. The outcome of the first phase of the project is a process to develop visualizations which can effectively communicate information about forest management planning to members of the public.

The latter phase of the project is an experimental comparison between visualizations and traditional communication media in the two public involvement contexts used in forest management planning in Ontario: public open houses and Local Citizens Committees. Experiments will be conducted separately for each group, as the LCC members have a much greater familiarity with the types of information used in forest management planning than do most lay people attending open houses. The LCC members will be randomly assigned to either the experimental or control group. Each group will work through a hypothetical forest management scenario, using either visualizations (experimental) or traditional communication media (control). Similarly, participants from the general public will be randomly assigned to experimental and control groups and will be presented with a hypothetical open house session involving either visualizations or traditional communication media.

Results

The effectiveness of the visualizations versus the traditional communication media will be compared by several methods. During the experimental sessions, participant observation will examine the way in which participants interact with the media and with each other. Following the sessions, interviews will be conducted with each participant to determine his or her satisfaction with the communication media. Participants will also be asked which specific aspects of the communication media helped and/or hindered their understanding of the information presented. Finally, the usefulness of the resulting public input will be evaluated by forest managers. Conclusions will then be drawn about the effectiveness of visualizations versus traditional communication media.

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