



# Outdoor Recreation, Education, & Tourism Lab

COLLEGE OF HEALTH | THE UNIVERSITY OF UTAH

Research to Inform Visitor Use Management at Millcreek Canyon, Salt Lake County, and the Uinta-Wasatch-Cache National Forest, Utah

*A Project Prospectus*

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## Introduction

This prospectus describes a proposed research project options between the University of Utah's Outdoor Recreation, Education and Tourism (ORET) Laboratory and representatives of Millcreek Canyon (MCC), in the Uinta-Wasatch-Cache National Forest. MCC is a valuable urban-proximate conservation and outdoor recreation resource adjacent to the burgeoning population of the Salt Lake Valley and the Wasatch Front. The purpose of this prospectus is to outline potential research projects that could contribute to the increased use experience and the increased management efficiency of MCC.

Informal observations have been made by concerned citizens of MCC regarding increasing use and impacts to recreational experiences. These include:

- Increasing pressure on the MCC resources from multiple recreational user types;
- The subsequent increased use without increased education and cooperation of all users is eroding the resource at a seemingly increased rate;
- Currently, there is little or no consequence to any user group for reckless or abusive behavior.

Apparent in the observations above is the fact that recreation, education, and capacity are inherently linked, and that the relationships between all three must be considered within and across MCC settings and zones. Consequently, our proposed research approach directly addresses this interplay and will identify the current and ideal temporal and spatial distributions of recreational visitor use, social and physical carrying capacity across different areas, necessary social and physical inputs for educational strategies, and ideal recommendations to minimize the negative impacts and maximize user cooperation. To accomplish this, researchers propose a multi-phase approach, incorporating a management-by-objectives framework, indicators and

standards of quality, current distributions of use, and experimental educational strategies, which are described below.

#### *Evaluating current use and visitor capacity*

The capacity process begins by fully understanding the current levels, and the spatial and temporal distributions of recreational use across and within Millcreek Canyon. Simultaneously, it is important to understand how existing infrastructure contributes to current physical, social, and ecological capacity. Understanding both current and type use and existing capacity helps identify the timing and frequency of when infrastructure may be at capacity (e.g., days of week and times of day that a parking lot is full). Furthermore, knowing where visitors are going, how they are getting there, and how much time is spent in specific locations (i.e., distribution) helps identify how travel patterns and recreational choices contribute to congestion/crowding and user density, and where and when current infrastructure including educational messaging is inadequate (Beeco & Brown, 2013).

#### *Indicators of quality and their associated standards*

Through information secured through an understanding of current use and existing physical capacity, managers can begin identifying areas of concern and setting objectives for resource conditions and the quality of the visitor experience within these areas of concern (e.g., Management-by-Objectives). These objectives must be expressed in a manner that can be used efficiently, and easily applied by managers, which is accomplished by identifying and using indicators and standards of quality. *Indicators* are manageable and measurable proxies for desired social or physical conditions (e.g., time waiting for a parking space at a trailhead) and *standards* are the minimal acceptable condition of the indicator variable (e.g., 5 minutes). If indicators are outside the scope of managers' control (e.g., weather), then there may be little reason to focus on them in the context of management planning. Effective standards are expressed in a quantitative manner, are bounded by time and/or space (e.g., per day, per mile of road), include some allowances for random or unusual circumstances, focus directly on impacts of concern (i.e., user conflict, littering/dog bags, erosion, trail etiquette, etc.), and are realistic (Hallo & Manning, 2011). By identifying visitors' and residents' most important indicators of quality and their associated standards, managers can prescribe specific objectives that guide their decision-making related to capacity for areas of concern.

Researchers will accomplish this approach using the phases described below. We briefly describe the research tools within each phase, which will be clarified further in a subsequent draft and full proposal after initial conversations with potential funders.

- Phase I: Evaluating current levels of and distribution of use through GPS visitor tracking, parking lot traffic and trail counts, and time-lapsed photography;
- Phase II: Identifying current physical and social capacity (user conflicts, impacts); evaluating existing infrastructure capacity and when and where capacity is reached through combining Phase I data with GIS analysis;
- Phase III: Identifying most salient indicators of quality and their associated standards; interviews and then questionnaires using visual and normative methods;
- Phase IV: Experimental educational strategies;
- Phase V: Implementation and monitoring.

## Summary of MCC Visitor Use Management Research Possibilities<sup>1</sup>

Research Category	Research Questions	Data and Collection Techniques	Deliverables	Approximate Costs per Seasonal Effort (Fall, Sumer, etc.)
<b>Visitor Use Monitoring</b>	<ul style="list-style-type: none"> <li>• How many people use MCC?</li> <li>• What are the types of use in MCC?</li> <li>• What is the temporal distribution of use and use types?</li> <li>• How many cars enter MCC each day/month/season?</li> </ul>	<ul style="list-style-type: none"> <li>• Motion-activated photography</li> <li>• Infrared trail counters</li> <li>• Vehicle strip counters</li> </ul>	<ul style="list-style-type: none"> <li>• Maps and data visualizations</li> <li>• Tabular statistical results</li> <li>• Current trends</li> <li>• Future use projections</li> </ul>	<ul style="list-style-type: none"> <li>• \$45k</li> </ul>
<b>Surveying</b>	<ul style="list-style-type: none"> <li>• Visitor demographics, motivations, and preferences</li> <li>• Place attachment</li> <li>• Perceptions of use conflict</li> <li>• Limits of Acceptable Change (LAC)</li> <li>• Indicators and thresholds</li> <li>• Depreciative behaviors</li> </ul>	<ul style="list-style-type: none"> <li>• On-site tablet-based surveys</li> <li>• Online surveys</li> <li>• Manipulated photographs</li> <li>• Interviews</li> <li>• Focus groups</li> </ul>	<ul style="list-style-type: none"> <li>• Tabular statistical results</li> <li>• Current trends</li> <li>• Future use projections</li> </ul>	<ul style="list-style-type: none"> <li>• \$30k</li> </ul>
<b>Spatial and Temporal Analyses</b>	<ul style="list-style-type: none"> <li>• What is the spatial and temporal distribution of visitors to MCC?</li> <li>• Where and when is recreational use concentrated?</li> </ul>	<ul style="list-style-type: none"> <li>• GPS Visitor Tracking</li> <li>• Motion-activated photography</li> <li>• Infrared trail counters</li> </ul>	<ul style="list-style-type: none"> <li>• Maps, GIS layers, data visualizations</li> </ul>	<ul style="list-style-type: none"> <li>• \$25k</li> </ul>
<b>Impact Patterns and Trends</b>	<ul style="list-style-type: none"> <li>• How do MCC visitors affect social and environmental conditions in the area?</li> </ul>	<ul style="list-style-type: none"> <li>• On-site tablet-based surveys</li> <li>• Transect surveys</li> <li>• Vegetation and groundcover analysis</li> <li>• Soil compaction, macroporosity, and infiltration rate</li> </ul>	<ul style="list-style-type: none"> <li>• Mapping and visualization</li> </ul>	<ul style="list-style-type: none"> <li>• \$30k</li> </ul>

<sup>1</sup> Cost projections are estimates based on previous projects only. Cost refinement will be based on several factors, including but not limited to: seasonality, frequency of surveys; specific research questions.

<b>Carrying Capacity</b>	<ul style="list-style-type: none"> <li>• Physical capacity</li> <li>• Ecological capacity</li> <li>• Social/experiential capacity</li> <li>• Managerial capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Parking analyses</li> <li>• On-site tablet-based surveys</li> <li>• Online surveys</li> <li>• Manipulated photographs</li> <li>• Spatial assessments, from VUM above</li> </ul>	<ul style="list-style-type: none"> <li>• Spatial and temporal distributions of recreational use</li> <li>• Analysis of existing infrastructure and how it contributes to current physical capacity</li> </ul>	<ul style="list-style-type: none"> <li>• \$50k</li> </ul>
<b>Education Program</b>	<ul style="list-style-type: none"> <li>• Following identification of key impacts and areas most affected, experiment with an Urban Rangers program to educate user groups across two high seasonal use periods (i.e., summer and fall)</li> <li>• Compare impact of educational program with and without Urban Ranger Support</li> </ul>	<ul style="list-style-type: none"> <li>• Utilize and adapt the current Urban Ranger program on the BST and Jordan River Trail to MCC.</li> <li>• Following impact analysis (carrying capacity, visitor use and impacts, surveying etc.) during high season (Summer/Fall); add the Urban Ranger Education program to test whether or not an educational presence is an effective tool to minimize overall impacts and conflict.</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of effective messaging strategies, to include but not limited to: signage, kiosk information, a pilot Urban Ranger program.</li> </ul>	<ul style="list-style-type: none"> <li>• \$35k</li> </ul>



## Research Capacity

The Outdoor Recreation, Education, and Tourism (ORET) Lab at the University of Utah has the research capacity and experience to undertake the questions and methods described. ORET researchers often collaborate as appropriate with an interdisciplinary research team consisting of University of Utah faculty and graduate students from the following academic departments and research centers:

- Department of Parks, Recreation, and Tourism; College of Health
- Department of City and Metropolitan Planning; College of Architecture and Planning
- Department of Biology; College of Science
- Global Change and Sustainability Center
- Center for Ecological Planning and Design

Where applicable, ORET researchers use students and course curriculum to collect and analyze field data.

[Dr. Kelly Bricker](#), [Dr. Jeff Rose](#), and [Dr. Nate Furman](#), have coordinated multiple research projects focusing on visitor use experiences and natural resources management. Dr. Bricker, Dr. Rose, and Dr. Furman's research have been conducted in locations including but not limited to Theodore Roosevelt National Park, Zion National Park (NPS), Yosemite NP, the Pacific Crest Trail (NPS, USFS, BLM, state, and private lands), the Uinta-Wasatch-Cache National Forest (USFS), the Tahoe National Forest, Utah Department of Natural Resources (DNR), Salt Lake City Public Utilities, and Salt Lake City Parks and Public Lands.

Working with teams of faculty and graduate students, they have presented at numerous international and regional conferences on natural resources topics related to outdoor recreation and the management of parks, open space, and protected areas. Their research, using similar methods as described in this prospectus, has been published in dozens of peer-reviewed journal articles, including *Society and Natural Resources*, *Park Science*, *Tourism Geographies*, *Journal of Park and Recreation Administration*, *Journal of Sustainable Tourism*, *Journal of Ecotourism*, *Applied Geography*, *Journal of Environmental Studies and Sciences*, *Journal of Political Ecology*, and *Journal of Leisure Research*, among others. Their research uses visitor surveys (internet and on-site sampling), in-depth interviews, GPS visitor tracking, trail and traffic counters, ethnography, and photographic methods (time-lapsed and manipulated conditions) to help managers evaluate visitors' a) on-site behaviors, motivations, and benefits, b) perceptions of environmental conditions, and c) open space crowding and carrying capacities.