Monitoring human use on trails in Canada's mountain national parks

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In 2007, social science data on backcountry day-use activity on trails was identified as an important data information gap for Banff, Jasper, Yoho, Kootenay, Mount Revelstoke, Glacier and Waterton Lakes national parks. This group of parks, collectively known as the mountain national parks, has approximately 3500 km of formal trails accessed by between 49% and 73% of park visitors (Ipsos Reid 2008, 2009). Data on levels and types of trail-use and profiles of this significant sector of the visiting population was insufficient to meet park management planning or State of the Park reporting requirements.

This information is also required due to a) Parks Canada's focus on connection to place and the link to authentic experiences, b) goals to attract target markets and c) recent visitation targets set for national parks. Researchers and wilderness managers must attempt to find a balance between potentially increasing use of wilderness areas and the effect of this use on the ecosystem. Specific to this research were requests for data to inform allocations of public safety, visitor experience and infrastructure reinvestment resources.

A two-pronged approach to research was developed; one prong addresses broader planning and reporting needs and long-term monitoring while the second prong addresses site-specific issues linked to public safety and infrastructure reinvestment. This presentation focuses on the methods employed and lessons learned to date and suggested improvements for the future.

Methods

Since the summer of 2008, a multi-year strategy for quantitative and qualitative trail-based research has been employed in the mountain parks.

Quantitative

Researchers employed 51cameras and 113 infrared counters, 15 magnetic counters and 25 *Tracksticks* to capture information on levels and types of use on over 230 trails. Selected summer trails represented high, medium and low levels of use; the summer documentation period generally covered mid-May to mid-October. Cameras and counters were installed at least 150m from the trailhead.

Tracksticks GPS units provided information specific use patterns on trail networks and off trail activity in sensitive areas (i.e. sites for caribou reintroduction). The units were distributed at trail heads and collected from boxes where trail-users left them following their day out. Data was downloaded to maps, indicating where the trail-users had been that day.

Winter documentation generally occurred between mid-November and April 30th. Infrared counters equipped with lithium batteries were installed on cross country ski trails and at access points to backcountry and off-piste skiing and ice climbs. Site selection was based on popularity and avalanche hazard rating; Glacier National Park, renowned for its backcountry skiing was specifically targeted.

Counters and cameras were checked and downloaded one week after installation and then every 1–2 months. Downloaded data was transferred to the central database in Banff. Photos were classified using *Reconyx Mapquest*, infrared and magnetic counter data was analyzed using *Trafx Reporter*. Use was reported on a monthly basis for annual reports; more precisely and ongoing for specific issues linked to wildlife–human interactions and compliance.

Qualitative

Researchers surveyed over 4600 summer and 690 winter trail-users. Summer surveys were delivered in-person on trails. Winter was more challenging; on good weather days, surveys could be conducted at trailheads. Fortunately, surveying was more productive at avalanche awareness nights, onsite promo events and at the Rogers Pass Visitor Center where winter trail users are required to register before entering the backcountry.

Respondents provided demographic information, a list of their favorite park-based activities, sources of information on trails, how they chose trails and what they had learned during their visit to the park. Open-ended questions gave respondents a chance to discuss – in their own words – their expectations and experiences during their visit to the park.

Survey data was analyzed using SPSS, Microsoft Excel software and inductive content analysis of emergent categories.

Lessons learned

Magnetic counters, used to record bike use, were unreliable when installed near train tracks or highways. They also record metal in horse shoes so were somewhat unreliable in remote areas.

Infrared counters record moving flora and fauna; in one case we had an 80% error rate due to grass blowing in the wind. Each counter needs to camera-calibrated for at least 2 weeks. On high use trails (1000+/day), set the counter to record hourly to avoid capacity issues. In very high use areas (2000+/per day) don't use any of this equipment (!)

Cameras discern types of use and collect wildlife and compliance information. However, the photos classification process is time consuming and, therefore, expensive. Using *Reconyx Mapquest* we developed categories for wildlife and human activities in a database accessible by science and enforcement staff. While this saves reclassifying photos to suit multiple needs, it does not mitigate the classification process.

Tracksticks exhibit a high error rate in canopy-forest; errors are usually extreme and easily identified.

During the winter, counters need to be constantly relo-

cated to compensate for changing snow levels and the fact that skiers break new trails that may no longer pass in front of the counter.

Based on parallel studies, we found significant differences between on-line and on-site survey results. In one case, online results indicated visitation was 91% Canadian and 3 % European compared to onsite results of 53% European and 33 % Canadian. Regardless, results from experience-based survey questions were similar.

In the future…

Managers will be called upon to defend decisions and management actions and therefore must have scientifically reliability information. We need to test new technologies and stress minimizing the risk of lost or damaged data by employing trained and experienced personnel. A 'universally' agreed upon ethic for the use of cameras needs to be established. We need sufficient data to conduct power analysis for trends. With limited budgets we need to be flexible and work closer with universities to complete the multiyear strategy. Explore opportunities to collaborate with other protected areas agencies and institutions.

IPSOS Ried, 2008. Parks Listens Online: Panel Members. A report prepared for the Parks Canada Agency

IPSOs Reid. 2009. Hiking Study. A report prepared for the Parks Canada Agency