

Recreational Use and Wildlife Movement near Mountain Park Communities: Integrating Social and Ecological Management Objectives in Banff National Park

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Abstract: The proximity and easy access to recreational areas are special features of communities in parks and protected areas. In Canada's Mountain National Parks, communities are often located in valley bottoms that are important habitat for a wide range of terrestrial wildlife. Managing the spatial and temporal distribution of recreational users near park communities presents a challenge for managers faced with the conflicting objectives of providing recreational opportunities while maintaining the quality of habitat for wildlife. To address land use issues between recreational users and wildlife, we develop management objectives that integrate recreational opportunities with wildlife habitat requirements. We outline methods to collect baseline recreation and wildlife data for an integrated land use plan and describe subsequent steps in the planning process.

INTRODUCTION

In many mountain parks and protected areas, the relationship between high and low levels of recreational use is often a function of distance from roads, parking lots or visitor service centres. As one travels further into backcountry areas, the numbers and density of recreational users decrease, reflecting an increasingly wilderness experience. Some recreational planning and management frameworks reflect this relationship between access and recreational use (Clark and Stankey 1979). Park managers often accept that human use near roads, parking lots and visitor service centres will be greater than what may be appropriate in more remote areas of the park. An exception may be where park facilities overlap ecologically sensitive areas. To reduce impacts associated with high levels of human disturbance, lower levels of recreational activity may be required in such areas to protect park resources.

In mountain parks with urban communities, the management of recreational use near ecologically sensitive areas may provide a unique challenge for land managers. The proximity of recreational opportunities is often a natural attractant for residents and visitors to park communities. The easy access to natural areas may result in high levels of recreational activity that extends beyond the ecological footprint of the community. In mountain environments, communities are often located in ecologically significant montane valleys. Integrating social and ecological management objectives, therefore, becomes a significant challenge to land managers tasked with optimizing recreational opportunities while maintaining ecologically sensitive habitat near mountain park communities. In Banff National Park, diverse recreational opportunities overlap important

wildlife habitat in peripheral areas of the town of Banff.

In this paper, we first identify land use issues between recreational users and wildlife. We then develop management objectives that integrate recreational opportunities with wildlife habitat requirements and discuss methods to collect baseline recreation and wildlife data for an integrated land use plan.

PEOPLE, WILDLIFE AND THE TOWN OF BANFF

Banff National Park, in the Central Canadian Rockies, is Canada's premier National Park, with annual visitation exceeding 4.5 million. The town of Banff is the main urban community in the park, with a resident population of 7500 that increases to over 25000 with visitors during the summer tourist season. Recreational activities in peripheral areas of the townsite include walking/hiking, cross-country skiing, mountain biking and horse riding. Access may originate from any location around the townsite, as many residents use the area on a daily basis. The opportunity to access natural areas 'from their doorstep' is a community attribute appreciated by a large number of residents. From a visitor perspective, peripheral lands are often the most convenient way to experience the aesthetic resources of the park.

The townsite is situated in the Bow River Valley, a flat montane valley with steep mountain slopes rising over 3000 metres. Several carnivore species use montane habitat in the Bow River Valley, including Grizzly bear (*Ursus arctos*), black bear (*Ursus americanus*), wolf (*Canis lupus*) and cougar (*Felis concolor*), in addition to ungulate (*Cervus spp.*) species. Lands adjacent to the town of Banff are important habitat for wildlife at

multiple spatial scales. At a local scale, ungulate populations provide an important prey source for carnivores in the Bow River Valley (Paquet 1993). At a regional scale, the Bow River Valley is a principal travel corridor for wildlife in the Central Rockies Ecosystem (White et al. 1995).

The development of a land use plan for peripheral areas of the town of Banff followed principles similar to the Limits of Acceptable Change (LAC) planning system (Stankey et al. 1985). As a first step, we identified issues between recreational use and wildlife habitat requirements to assist in the development of management objectives.

SOCIAL AND ECOLOGICAL ISSUES

The ecological footprint of the townsite, coupled with its location in a narrow part of the Bow River Valley, limits available montane habitat for wildlife movement on the periphery of the town. These peripheral areas also provide some of the most accessible recreational opportunities for residents and visitors in Banff National Park.

The following issues were identified as significant in the development of management objectives for an integrated land use plan:

Landscape fragmentation: roads, facilities and the recent proliferation of trails radiating from the town of Banff has fragmented wildlife habitat, reducing landscape connectivity important for wildlife movement in the Bow River Valley.

Wildlife-human conflicts: the frequency and intensity of human use in peripheral areas has altered wildlife behaviour and predator-prey relationships, resulting in wildlife displacement, habituation, and mortality.

Recreational behaviour: the easy access to peripheral areas from the town of Banff has resulted in a long-term pattern of use and increasing recreational expectations by residents and visitors.

INTEGRATING MANAGEMENT OBJECTIVES

It has been recognized that clearly stated management objectives are important in guiding the development of a recreational land use strategy (Manning 1986). In addition, the complexity of managing for recreational opportunities and wildlife habitat requires an integration of social and ecological objectives. In this respect, the primary management objective was to optimize recreational opportunities while maintaining the viability of wildlife habitat near the town of Banff. To assist in the preparation of an integrated land use plan, two key sub-objectives and supporting social and ecological indicators were identified.

1. *Objective:* to provide recreational opportunities that respect the spatial and temporal requirements of wildlife in movement corridors.

Indicators: wildlife use in corridors; predator-prey interaction; change in wildlife displacement, habituation and mortality.

2. *Objective:* to promote appropriate recreational behaviour and expectations through education and communication initiatives.

Indicators: compliance with management actions by recreational users; improved understanding of park objectives; shifts in recreational user expectations.

DEVELOPING A SOCIAL AND ECOLOGICAL BASELINE

To measure the success of management actions and evaluate changes in social and ecological conditions, baseline information is required. To describe existing patterns of wildlife and recreational use in peripheral areas of the town of Banff, information was collected on wildlife movement patterns, trails, recreational use of trails, and resident and visitor use patterns.

Wildlife movement patterns

To determine the status of wildlife movement near the town of Banff, data was used from wildlife monitoring research in Banff National Park (Duke 2001). The spatial and temporal patterns of wildlife movement were determined using radio-telemetry data in summer and transect monitoring and backtracking techniques in winter. These data provided detailed movement patterns for a suite of carnivore species using habitat near the town of Banff. Data was then compiled using a geographic information system (GIS) to allow spatial and temporal comparisons to recreation use patterns.

Trail inventory

To better understand the spatial distribution of recreational users, trails near the town of Banff were inventoried, classified and mapped using a GIS. Trails were first ground-truthed using a geographic positioning system (GPS). This included both linear features (e.g. trails and roads) and point features (e.g. parking areas, viewpoints, and trailheads). Trails were then classified into four main categories:

1. *Primary:* trails maintained by park management,
2. *Secondary:* trails not maintained by park management, but well established due to frequency of recreational use,
3. *Tertiary:* trails branching from primary and secondary trails that appear to receive infrequent recreational use,
4. *Game:* trails that appear to be wildlife (game) trails but show some signs of recreational use.

In addition, trail attribute data was collected on the type of recreational activity occurring on trails (i.e. hiking, horse riding, mountain biking, cross-country skiing) and information related to surface

material (i.e. natural, asphalt, wood chips). A GIS was then used to spatially compare recreational use with data on wildlife movement patterns and other ecological factors such as soils, vegetation and hydrology.

Recreational trail use

The spatial and temporal patterns of recreational use on primary trails were determined using a combination of active and passive trail counters, remote photo stations, and observational reporting. This provided detailed information on the frequency and intensity of recreational use near the town of Banff.

An active and passive electronic trail monitoring system, combined with a remote camera, was used to record the date and time of recreational users entering and exiting trails. Photographs of trail events allowed the distinction between recreational and wildlife trail use. Observational reporting conducted bi-weekly, provided an opportunity to validate trail counters and classify recreational user groups.

Resident and visitor use patterns

Two survey questionnaires were developed to collect information from recreational users near the town of Banff. The first focused on gathering data from motorists exiting day-use recreational areas. This survey data provided information on user profile, time spent at the site, site familiarity, recreational activities and places visited. In addition, users were asked to rank the importance of factors influencing their decision to visit the site with respect to visitor motivation, site attributes, and place attachment. Vehicle counters were used to record the total number of vehicles entering and exiting an area, the time of day, and vehicle type (e.g. recreational vehicle, car, bus, and motorbike).

The second survey focused on developing a recreational profile of town of Banff residents (Mauro in prog.). Residents were asked to identify favourite trails, most common recreational activity and the time and frequency of participation. Respondents were also asked for their reasons for choosing a particular trail, familiarity with the area and attitudes toward trail management techniques. In addition, focus groups were conducted to obtain information about trail use in the area, thoughts relating to the phrase 'trail management', the impact of various user groups, and trail issues.

NEXT STEPS

The steps taken to identify issues, define management objectives, identify indicators and determine the spatial and temporal patterns of use are integral in the development of a land use plan for peripheral areas of mountain communities such as the town of Banff. The analysis of the trail monitoring data, resident and visitor surveys and

focus group discussions is presently in progress. Subsequent steps in the planing process will include identifying management alternatives, developing and implementing management actions and monitoring social and ecological conditions. A stakeholder working group has been established to assist in the planning process and to ensure public involvement in decision-making.

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