



MOUNT REVELSTOKE

NATIONAL PARK OF CANADA

AND

GLACIER

NATIONAL PARK OF CANADA

State of the Parks Report

March 31, 2008

EXECUTIVE SUMMARY

The Mount Revelstoke and Glacier National Parks State of the Parks Report (SOPR) provides an assessment of the state of ecological and cultural resources, and the first formal assessment of visitor experience and public education in two parks that represent a unique ecological region and cultural history in the national park system. The report also includes an assessment of the cultural resources in Rogers Pass National Historic Site, which is located within Glacier National Park. The primary purposes of the State of the Parks Report are to:

- provide an analysis of the state of the two parks regarding the key elements of Parks Canada’s mandate, including ecological integrity, the protection of cultural resources, facilitation of memorable visitor experiences and public education;
- report on the results of management actions in respect to these key elements;
- provide key input to park management planning, and serve as a tool for decision-making with respect to issues associated with each of the mandate elements and their inter-relationships; and
- communicate the state of these key elements to stakeholders and the public.

The report is based on monitoring and research conducted by Parks Canada and external agencies. Information from existing monitoring and research programs was used to evaluate and rate the condition of a series of measures, which in turn were used to rate the suite of indicators presented in the following table.

Since this report is based on existing research and monitoring programs that have been designed to meet a wide variety of management objectives, there are inevitable variations in data quality and quantity, and some information gaps exist. For many measures, firm targets and thresholds have not yet been established. Where necessary, the professional judgment of Parks Canada specialists was used to develop condition ratings.

Future State of the Park Reports will be based on a consistent, comprehensive, long-term monitoring program that is designed to assess the condition of all key aspects of park management, including ecological and social indicators. It is expected that this program will be implemented in Mount Revelstoke and Glacier National Parks in 2008.

The following symbols are used in this report:

Condition		Trend	
<i>Good</i> : the condition of the indicator/measure is satisfactory.		<i>Improving</i> : the condition of the indicator/measure is improving.	
<i>Fair</i> : there is concern regarding the state of this indicator/measure.		<i>Stable</i> : the condition of the indicator/measure is not changing.	
<i>Poor</i> : the condition of the indicator/measure is poor or low.		<i>Declining</i> : the condition of the indicator/measure is declining.	
<i>Not rated</i> : there is insufficient information to determine condition.		<i>Not rated</i> : there is insufficient information to determine trend.	N/R

A summary of ratings for a range of ecological integrity, cultural resource management, visitor experience and public education indicators is presented in the following table. A red square indicates poor condition, a yellow triangle fair condition, and a green circle good condition. A grey diamond indicates that there is insufficient information to provide a rating.

Arrows indicate the trend (increasing, stable or decreasing) for the particular indicator as it relates to ecological integrity, cultural resource management, visitor experience or public education. Due to data limitations, including lack of recent inventories and evaluation, trends will not be reported for cultural resource measures and indicators.

Heritage Resource Protection

Ecological Integrity (EI)

Native Biodiversity		The rating for native biodiversity is based on two measures. Mountain Caribou are in poor condition and declining, and terrestrial birds are in good condition and are stable. Increased efforts are required to understand population trends for other wildlife species in Mount Revelstoke and Glacier National Parks. More measures will be developed in order to better assess this indicator in the future.
Climate & Atmosphere		With limited datasets that have high variability, currently climate change cannot be directly linked to changes in these measures, but initial analysis shows corroborating trends with regional findings. Measures include precipitation, temperature, snow pack and glaciers.
Aquatic Ecosystems		Water quality assessed by Environment Canada is good but declining with some increases in alkalinity and chlorine. The human footprint on aquatic ecosystems is minimal and rated in good condition with an increasing trend in ecological integrity. Water quantity remains in good condition and although there were no significant changes, initial analysis shows similarities with regional findings of weak declining trends.
Regional Landscape		The greater ecosystem surrounding the parks is in poor and declining condition because of increased land use and resource exploitation. Disturbance by fire is good but declining because of low incidence of fire in some ecosystems.
Terrestrial Ecosystems		Non-native vegetation was rated as fair and declining because of the potential threat it poses to biodiversity in sensitive ecosystems and because of the inability to reduce its spread. Forest pest disease is in fair condition and is stable.

Heritage Resource Protection

Cultural Resource Management (CRM)

Resource Condition		The condition of some cultural landscapes and archaeological sites has been stabilized but more effort is required to protect others from further deterioration, including the Nels Nelsen ski jump. Federal heritage buildings are in fair condition.
Selected Management Practices		Comprehensive inventories give a good indication of existing cultural resources. Further work is needed to keep inventories current and to update the Cultural Resource Management Plan.

Visitor Experience (VE)

<p>Understanding Visitors</p>		<p>There is a good understanding of visitors to Mount Revelstoke and Glacier National Parks, and knowledge continues to improve each year. The information is derived from the 2005-2006 Patterns of Visitor Use study, and previous visitor research projects. Visitor segments have been examined through five segmentation models.</p>
<p>Providing Opportunities</p>		<p>Visitors are offered a menu of opportunities that allows them to customize their park experience according to their expectations and circumstances. Visitor opportunities range from self-guided interpretive trails in every ecological setting to trail-less wilderness experiences. Short hikes, walks, sightseeing, exhibit viewing and backcountry ski touring are the most popular activities. Recent and ongoing investments in park infrastructure are improving opportunities.</p>
<p>Quality Service</p>		<p>Visitor satisfaction information is derived from the Patterns of Visitor Use study, and Visitor Information Program surveys conducted since 1994. In Mount Revelstoke and Glacier, 94 % of visitors were satisfied with their visit (scoring 4 or 5 on a scale of 1 to 5) and 63 % of visitors rated their visit as extremely enjoyable (scoring 5 on a scale of 1 to 5).</p>
<p>Connecting with Place</p>		<p>This new national indicator is not rated, as there are no specific data for Mount Revelstoke and Glacier National Parks. There is anecdotal evidence of place attachment and spiritual connection in the guest book commentary that has been collected for more than 25 years.</p>

Public Education (PE)

<p>Understanding Audiences</p>		<p>There is a good understanding of the park audiences, and knowledge continues to improve each year. The information is derived primarily from the Patterns of Visitor Use study, and other visitor research projects. In-park audience segments have been examined through five segmentation models. There is only limited information on “virtual visitors” or distant audiences.</p>
<p>Extending our Reach</p>		<p>There is not yet a thorough understanding of all audiences who make contact with Mount Revelstoke and Glacier from off-site (eg. through the website), visitors who contact other agencies (eg. Tourism BC) or visitors who contact tourism businesses around the parks. This indicator is rated as improving, as the results of the Patterns of Visitor Use study offer insights into the extension of our educational reach. Training is available to commercial guides so that they can provide useful and accurate information to visitors.</p>
<p>Facilitating Understanding</p>		<p>A menu of learning opportunities is available, from school programs to the website, from self-guiding tours to personal interpretive programs. While there is a limited amount of data on this new national indicator, the indicator is rated as improving. Research on the effectiveness of heritage presentation has been conducted at the park discovery centre and self-guiding trails over the past ten years, and more recently through the Patterns of Visitor Use study.</p>
<p>Influencing Attitudes</p>		<p>This new national indicator is not rated, as there are no specific data for Mount Revelstoke and Glacier. There is anecdotal information that Parks Canada is able to have success in influencing of public attitudes. Strong communication programs have been helpful in the positive public reception of new policies, operational changes and crisis communications.</p>

Ecological integrity within Mount Revelstoke and Glacier National Parks is generally considered to be *fair* with a *declining* trend, indicating that concern is warranted. Several individual measures are considered to be in poor condition. Within the parks, the national transportation corridor is a major ecological stressor on all ecological integrity indicators. Measures affected by the transportation corridor include water quality, wildlife populations, non-native plants and landscape fragmentation.

The long-term viability of some regional wildlife populations such as mountain caribou and grizzly bear remains uncertain as a result of many pressures, including development-related habitat loss and fragmentation, and increased human activity with related displacement from important habitat. Many of these concerns are exacerbated by the fact that Mount Revelstoke and Glacier National Parks are isolated from other protected areas and are subject to intensified stressors from outside the parks.

Cultural resource management in Mount Revelstoke and Glacier National Parks, including Rogers Pass National Historic Site, is progressing relatively well, with an overall *fair* condition rating. Many cultural resources have benefited from recent stabilization efforts. Other features require additional attention. Inventories and a Cultural Resource Management Plan exist, and could benefit from updating.

Visitor experience in Mount Revelstoke and Glacier National Parks is rated *good* with an *improving* trend. Significant investments over recent years have built on a solid foundation of visitor research, quality experiences, opportunities, services and facilities. Visitor surveys indicate a high level of satisfaction with the experiences and services provided in Mount Revelstoke and Glacier National Parks. There are no specific data available on visitor place connection in Mount Revelstoke and Glacier.

Public education in Mount Revelstoke and Glacier National Parks is considered to be in *fair* condition with an *improving* trend. A wide variety of personal services and new non-personal interpretive and educational opportunities are available within and beyond the parks. Parks Canada has a good understanding of the audiences that visit the parks, but less data on distant audiences. Limited research has been conducted into the long-term effectiveness of the new communications programs in facilitating public understanding and appreciation for the parks. There are no specific data measuring the influence of park educational programs on public attitudes and behaviour.

This State of the Parks Report describes some key park management actions that have been undertaken to protect ecological and cultural resources and enhance public education and visitor experience. Cumulatively, these actions and the future actions identified in the current Park Management Plan are expected to result in improvements to ecological integrity, visitor experience and public education in Mount Revelstoke and Glacier National Parks. As long-term monitoring programs are further developed and sufficient time has passed for the full effects of actions to be realized, more specific measurement and reporting of results is anticipated.

In addition, the State of the Parks Report identifies key issues, challenges and opportunities related to ecological integrity, cultural resources, visitor experience and public education. The Park Management Plan recognizes the majority of the issues identified in this report and in most cases it provides direction to address those challenges and opportunities. In some cases, the State of the Parks Report highlights specific areas that may benefit from additional attention as part of the upcoming management plan review.

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1.0 INTRODUCTION

Purpose and Requirements of State of the Park Reporting

Park management plans are prepared in consultation with the public and are reviewed every five years. They describe a vision for each of Canada's National Parks and set out a strategy to transform this vision into reality. Approved by the federal minister responsible for Parks Canada and tabled in Parliament, these plans are key accountability documents that inform the public about how a national park is carrying out its mandate.

The Mount Revelstoke and Glacier National Parks State of the Parks Report was designed to formalize the first step in the park management plan review process. The report evaluates the current state of ecological integrity, cultural resource management, visitor experience and public education in Mount Revelstoke and Glacier National Parks. It also includes the identification of key issues and opportunities for the next review process and park management planning cycle.

Achieving a Vision for Mount Revelstoke and Glacier National Parks

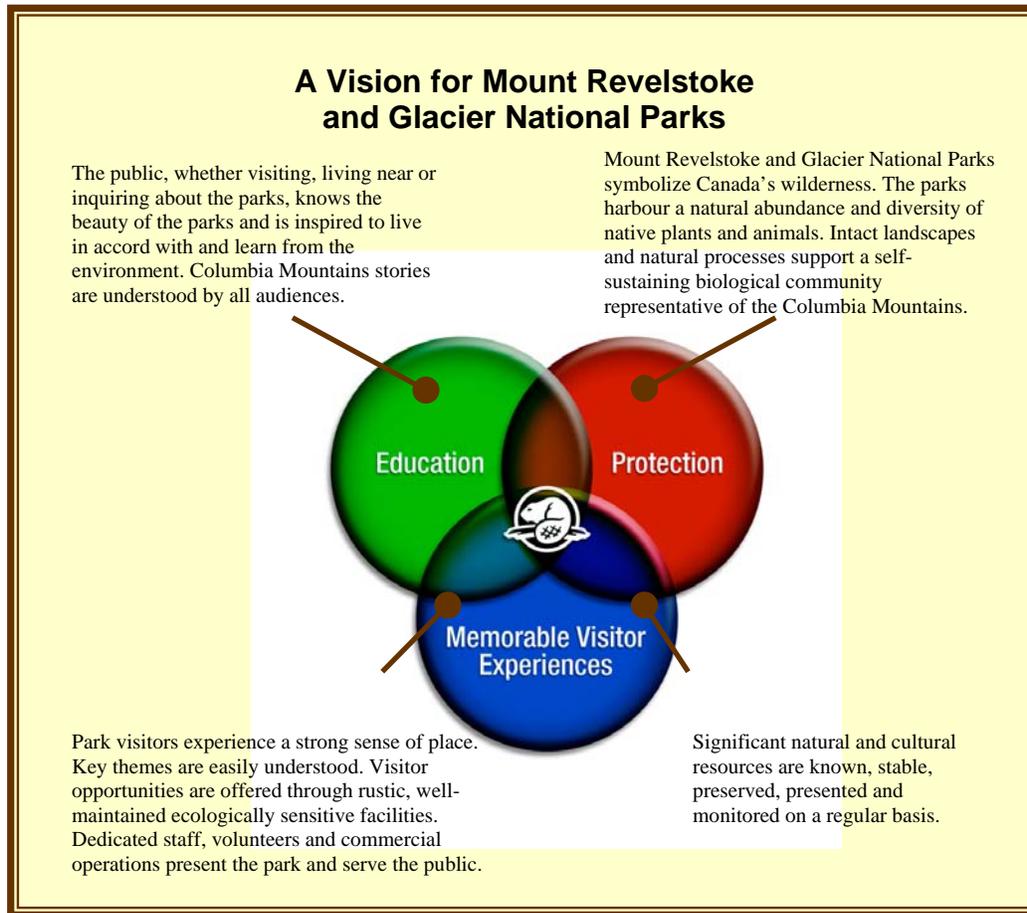
The Park Management Plan provides a vision statement and outline of core strategies that integrate resource protection, visitor experience and public education in ways that are mutually supportive and interdependent and provide the underlying conditions and measures for evaluating the state of the parks. Figure 1 illustrates how the vision elements achieve Parks Canada's integrated mandate. Without public appreciation and understanding of the value of the parks' natural and human history, stewardship and protection of ecological and cultural resources would not occur. Protection and presentation of the parks' natural beauty, functioning ecosystems and heritage values are essential to providing visitors with a memorable park experience.

The Park Management Plan sets out the following strategies to achieve this vision.

- Park visitors, regional citizens and Canadians understand, value and actively support ecological integrity.
- Parks Canada and other land managers in the Columbia Mountains improve the health of the larger ecosystem.
- Intact habitats and natural processes support a self-sustaining biological community.
- Parks Canada and First Nations communities work together to build relationships and develop opportunities for First Nations people to present their heritage.
- Park visitors, regional citizens and Canadians understand and support the goal of preserving historical sites and objects within the parks.
- Park visitors enjoy a range of appropriate opportunities that reflect the wilderness character and the rustic, natural setting of the Columbia Mountains.

Section 5.0 of the State of the Parks Report, Evaluating Management Actions, provides a summary of how the vision and strategies for Mount Revelstoke and Glacier National Parks are being achieved.

Figure 1. A Vision for Mount Revelstoke and Glacier National Parks



The Park Context

Glacier National Park encompasses 1350 km² and Mount Revelstoke National Park encompasses 260 km². The two parks protect a portion of the Columbia Mountains natural region in British Columbia. This region experiences relatively mild winter temperatures, warm summers, and receives abundant rain and snow. The vegetation is largely determined by elevation. At lower elevations, Western Red Cedar and Western Hemlock forests occupy less than 20 % of the parks. Containing some of the oldest forest stands and species that require this habitat for survival, this habitat is rare outside of protected areas (Parks Canada, 2005).

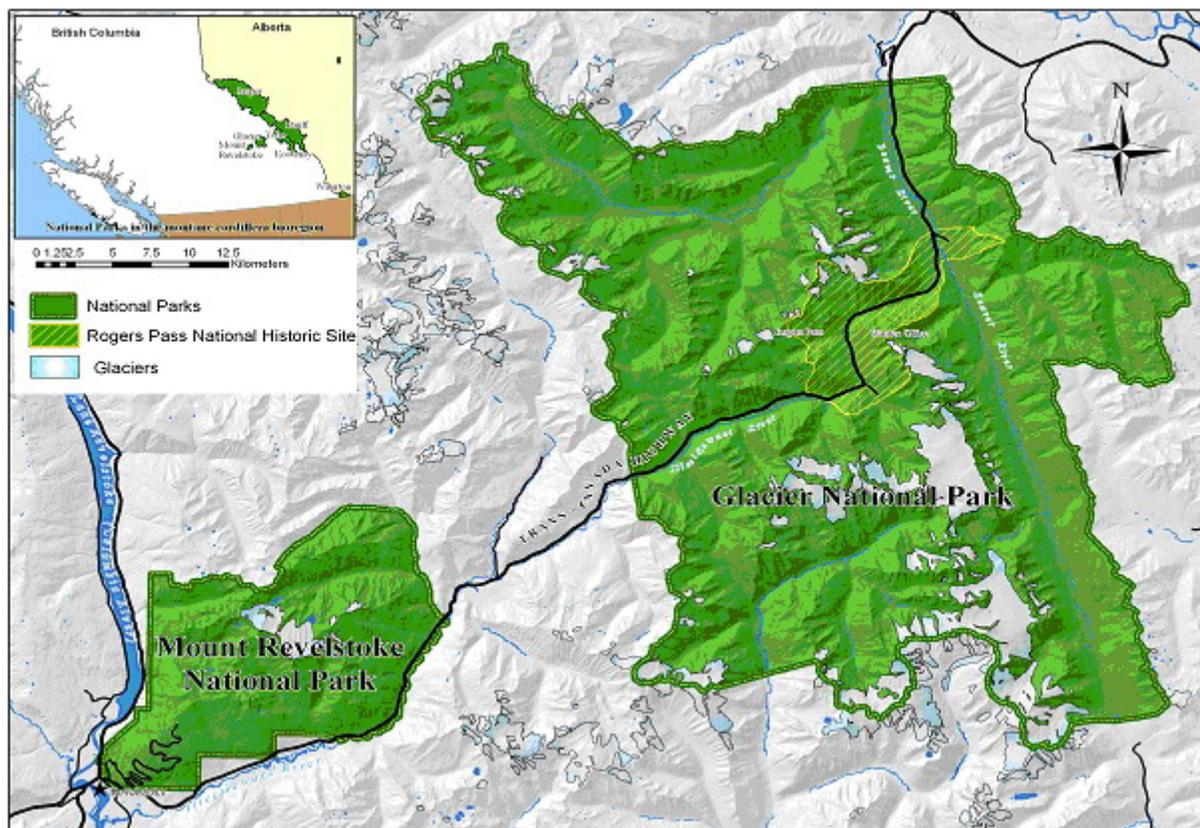
Engelmann Spruce, Sub-alpine Fir and Mountain Hemlock forests occur on mid to upper slopes and open up into parkland meadows as one moves higher, until alpine tundra dominates at the highest elevations. More than half of Mount Revelstoke and Glacier National Parks is alpine tundra, rock and glaciers. Riparian areas in the valley bottoms occupy less than 0.6 % of the total park area.

Mount Revelstoke National Park lies adjacent to the community of Revelstoke with its population of 7,500 (City of Revelstoke, 2006). Glacier National Park is approximately 48 km east of Revelstoke and encompasses Rogers Pass National Historic Site (Figure 2). Rogers Pass is significant because of the role the pass played in the construction and development of the main line of the Canadian Pacific Railway into a major national transportation route between 1881 and 1917. This national historic site occupies a 25 km-long corridor along the Trans-Canada Highway,

and extends from the valley bottom to the top of the ridges of the flanking mountains. The modern highway corridor is 53 km long in Glacier National Park and 12 km long through Mount Revelstoke National Park. The Trans-Canada Highway was constructed through the parks in 1962 and its use has increased dramatically since that time. Approximately two million vehicles travel through the parks annually and approximately 40 trains run through the transportation corridor daily (Parks Canada, 2005). The transportation corridor, tree harvesting, hydroelectric dams and urban development have altered significantly the area surrounding the parks.

Figure 2 provides an inset map that shows the national parks of the Montane Cordillera Bioregion including Mount Revelstoke, Glacier, Waterton Lakes, Yoho, Kootenay, Jasper and Banff national parks. These parks have similar ecological characteristics and are developing State of the Parks Reports and consistent monitoring programs as a regional unit.

Figure 2. Map of Mount Revelstoke National Park, Glacier National Park and Rogers Pass National Historic Site with inset map of National Parks of the Montane Cordillera Bioregion.



2.0 ASSESSMENT AND EVALUATION METHODS

Parks Canada is developing a comprehensive monitoring program to assess the performance of National Parks in protecting ecological and commemorative integrity, educating the public about Canada's heritage, and facilitating memorable visitor experiences. Within each of these three broad areas, several indicators have been identified to provide a broad representation of key factors influencing the national parks. Each indicator is an index supported by several measures that are based on data gathered through a variety of sources.

The national monitoring program was still evolving as this State of the Parks Report was being prepared. Where possible, the indicators and measures are reported using the results of existing long term monitoring and research programs for ecological and commemorative integrity, public education and visitor experience. Other national indicators and measures have been established very recently, and existing monitoring programs can provide only limited data on which to base evaluations and ratings. In some cases monitoring has not yet begun and information gaps exist.

Sources of past and current monitoring or research data for the report include programs undertaken both by Parks Canada and by external agencies. In some cases where limited data is available, the professional judgment of Parks Canada experts, based on evidence, is used to supplement data analysis. As the long-term monitoring program develops, existing gaps will be filled and future State of the Park Reports will be based on increasingly more comprehensive, rigorous and statistically powerful data. In addition to providing an assessment of the state of Mount Revelstoke and Glacier National Parks, this report will provide a framework for this new monitoring program against which future State of the Park Reports can be compared.

The indicators used to assess ecological issues are rated based on their condition and trend as it relates to ecological integrity. For cultural resource indicators, condition and trends relate to the integrity of the cultural resource rather than ecological integrity. The condition and trend ratings are *italicized* throughout the document to emphasize the use of these concepts. For quick reference, symbols and colours are used to represent the condition and trend of the indicators and measures.

Table 1. Symbols used for indicator evaluation

Condition		Trend	
<i>Good</i> : the condition of the indicator/measure is satisfactory.		<i>Improving</i> : the condition of the indicator/measure is improving.	
<i>Fair</i> : there is concern regarding the state of this indicator/measure.		<i>Stable</i> : the condition of the indicator/measure is not changing.	
<i>Poor</i> : the condition of the indicator/measure is poor or low.		<i>Declining</i> : the condition of the indicator/measure is declining.	
<i>Not rated</i> : there is insufficient information to determine condition.		<i>Not rate</i> : there is insufficient information to determine trend.	N/R

A distinction is necessary between the trend rating assigned to an indicator or measure and the characteristics of the measure. For example, the number of non-native plants or exotic pathogens may be increasing, but the trend rating and associated arrow would be downward, indicating *declining* ecological integrity.

Measures are rated by comparing the actual state of the measure with its desired state, or target. For some measures, targets are established in existing park management plans. In other cases, targets established by agencies other than Parks Canada can be used. Where data are insufficient, the professional judgment of Parks Canada specialists, based on evidence and validated through expert consultation, is used to determine the rating. Alternatively, some indicators and measures are not rated due to lack of information.

Condition and trend ratings were consistently rolled into indicator ratings using a simple mathematical averaging process, resulting in an indicator rating consistent with the measure

rating in the majority. In cases where there is no majority among measure ratings, the indicator was rated as *fair* to reflect uncertainty as well as concern.

Indicators for visitor experience and public education have been developed more recently, and fewer specific measures and monitoring programs are in place, especially for public education. Consequently, ratings for these indicators are mostly based on an overall analysis of existing survey data, primarily from a recent Patterns of Visitor Use study, supplemented by site-specific survey information and the professional opinion of Parks Canada specialists, based on evidence and validated through expert consultation.

3.0 ASSESSMENT OF THE STATE OF HERITAGE RESOURCES, VISITOR EXPERIENCE AND PUBLIC EDUCATION

3.1 Key Outcomes

The Mount Revelstoke and Glacier National Parks Management Plan provides key outcomes for ecological and cultural integrity, public education and visitor experience. The achievement of these key outcomes provides the basis for developing management actions.

The key outcomes of heritage resource protection include:

- determination of the current trend in population size and establishment of viable population targets for selected wildlife species;
- reduction of the number and abundance of non-native plants;
- reduction in interference with natural processes;
- no reduction in old growth and riparian forests due to park practices and decision-making, except if restoring natural processes;
- no net loss of wetland habitat;
- water quality in Mount Revelstoke and Glacier National Parks has targeted standards above applicable national or provincial standards for aquatic life and human health;
- intervention in natural processes to prevent the loss or damage of significant cultural resources; and
- understanding of historic use of the park areas by First Nations through the involvement of neighbouring First Nations groups.

Key outcomes for public education include:

- increased communication of ecological integrity, cultural resource integrity and commemorative integrity messages;
- level of connection/engagement of visitors who use in-park heritage presentation services is increased after their visit;
- level of connection/engagement of residents who participate in outreach programs is increased after participation; and
- increased number of people are contacted through personal communications by Parks Canada staff, third party programs and the parks' website.

Key outcomes for visitor experience include:

- growth in annual visitation is directed to facilities that can sustain additional use considering ecological integrity, cultural resource protection and visitor experience quality;

- 95 % of visitors rate their experience as satisfying or very satisfying;
- adherence to Canadian Drinking Water Quality Standards;
- visitor perceptions of the quality of their experience match the visitor opportunity objectives for each area of the parks;
- increased visitor security, expressed as a ratio of property crimes to visitor numbers; and
- increased visitor use of risk decision-making information, with a subsequent decrease in the frequency and severity of public safety incidents.

Whether key outcomes of the resource protection, public education and visitor experience have been realized is determined through the condition ratings for each indicator as well as the assessment in Section 5.0 “Evaluating Management Actions”.

3.2 Condition of Information Base

Information used to evaluate and rate the condition of the measures and indicators in this State of the Parks Report came from a variety of research and monitoring programs within and outside of the Parks Canada Agency. These programs were designed to meet differing management objectives and have been undertaken for varying periods of time with varying levels of scientific rigour. There are, therefore, variations in data quality and quantity, and information gaps exist. In all cases, evaluation and condition ratings were based on the best data available and involved consultation with Parks Canada specialists to determine the veracity and applicability of the data. External experts were also consulted where appropriate. Where data are insufficient, the professional judgment of Parks Canada staff, based on evidence and validated through expert consultation, was used to determine condition ratings.

While the quality and quantity of information available is different for each measure, the two following general types of information illustrate some of the challenges associated with this issue.

- Information based on high-quality, large-quantity data derived from established long-term research or monitoring programs intentionally designed to evaluate a specific measure at the broad park level or regional scale. Data obtained through such a program are likely to be statistically powerful and, in combination with established targets and thresholds, provide a high level of confidence in condition ratings.
- Information based on limited data derived from research and monitoring programs that have been in place for a relatively short period of time or that are intentionally designed to evaluate a measure on a more local, site-specific basis. Data captured through such a program are likely to have less statistical power for park-wide application, and specific targets and thresholds may not be established. When combined with expert evaluation and local knowledge to determine the applicability of the data to the broader park level and to address information gaps, this information can provide a moderate level of confidence in condition ratings.

For this State of the Parks Report, much of the evaluation and many condition ratings are based on relatively recent or short-term monitoring work, much of which has been targeted at specific issues, or locations of concern. The number of measures available to inform some indicators was also limited, requiring additional input from Parks Canada specialists to arrive at accurate condition ratings. One exception, the visitor experience research program, includes data on understanding visitors, understanding audiences and service quality ratings that date back to 1993 or earlier.

Parks Canada’s monitoring and reporting program continues to evolve. Over time, the program is expected to become more comprehensive and scientifically rigorous, producing higher quality and more statistically powerful data for future state of the park reporting and management decision-making.

While it is acknowledged that there is room for future improvement, Parks Canada is confident that this State of the Parks Report provides an accurate assessment of the state of Mount Revelstoke and Glacier National Parks, and identifies the key issues of concern to be considered in future management planning.

3.3 Heritage Resource Protection

3.3.1 Ecological Integrity

An ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of native species and biological communities, rates of change and supporting processes. In other words, ecosystems have integrity when their native components (plants, animals and other organisms) and processes (such as fire, succession and predation) are intact.

Parks Canada is developing a national Ecological Integrity Monitoring and Reporting Program, based on eight geographical regions known as bioregions. The seven mountain parks comprise the Montane Bioregion. Common indicators and measures will be monitored in each park in the bioregion. The common indicators used in this State of the Park report are:

- Native Biodiversity
- Terrestrial Ecosystems
- Aquatic Ecosystems
- Regional Landscape
- Climate and Atmosphere.

Each indicator is based on a number of measures, some of which are also common to the bioregion (e.g. water quality) and some of which are park specific. **Due to the summary nature of this report, not all of the measures will be addressed in detail. Specific measures are referenced to illustrate the condition and trend rating of the indicators. Background information is available on all measures.**



A park’s biological diversity is a key element of ecological integrity. Diversity imparts resilience to ecosystems. A diverse ecosystem is more resistant to stresses or changes in the environment. The best way to protect ecological integrity is to maintain native biodiversity. Since the intent in the national parks is to conserve only native species and ecosystems, rather than exotic species introduced following park establishment, the term native biodiversity is used.

Biodiversity occurs at several different scales: genetic, species, community and landscape. Each requires special attention to ensure its continuing viability. Currently, this indicator is primarily represented by species-level biodiversity. Native biodiversity monitoring in Mount Revelstoke and Glacier National Parks targets the populations of flora and fauna that have been listed

federally by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Mount Revelstoke and Glacier provide some habitat to Southern Mountain Caribou that are listed as threatened under the Species at Risk Act (SARA). Grizzly Bear, Wolverine, Coeur d’Alene Salamander and Western Toad make their home in Mount Revelstoke and Glacier and are identified as species of concern under SARA. Another species being reviewed for possible listing as a species of concern is the Westslope Cutthroat Trout population in British Columbia that includes the population in Mount Revelstoke and Glacier.

Currently the native biodiversity indicator is rated as *fair* and *stable* based on two measures: Southern Mountain Caribou and terrestrial bird monitoring. In the future, biologists at Mount Revelstoke and Glacier National Parks will examine amphibian, Grizzly Bear, and Mountain Goat populations as potential measures of ecological integrity. A recent habitat and population assessment in 2006 suggests that Mount Revelstoke National Park protects a larger number of Coeur d’Alene Salamanders than anticipated (Larson, 2007). Current population estimates for Grizzly Bear are unknown, but studies on Grizzly Bear distribution and abundance in the Columbia Mountains suggest that the area of the two parks, 1610 km² in total, does not provide sufficient habitat for a stable Grizzly Bear population (Apps et al., 2004). Population density estimates for Mountain Goat and Wolverine are unknown for Mount Revelstoke and Glacier National Parks.

Table 2. Condition and trend ratings for Native Biodiversity measures

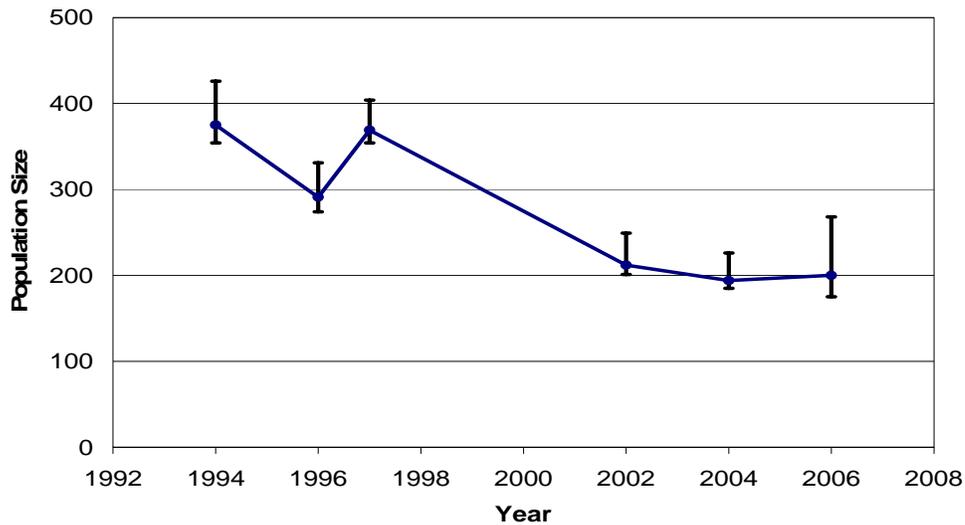
Measure	Condition/Trend
1. Southern Mountain Caribou	
2. Terrestrial Birds	

Southern Mountain Caribou (*Rangifer tarandus caribou*) populations have been declining in response to old-growth habitat loss and fragmentation, and increased human disturbance since the 1930s or earlier (Spalding, 2000). They have been monitored in Mount Revelstoke and Glacier and the surrounding area since 1993 and have consistently shown a *declining* trend.



The measure is rated *poor* because the Park Management Plan target of an improving trend has not been achieved, and four of the five local populations now consist of 30 or fewer animals (McLellan et al, 2006) (Figure 4). Currently the Columbia South population uses the national parks and provincial land to the north, and this small isolated population is at very high risk of extirpation (Hatter, 2006). Mount Revelstoke and Glacier, with their large ice fields and small land base, do not provide sufficient habitat to support a self-sustaining population of caribou. The broad consensus is that caribou populations need to be large enough to survive predation and human disturbances including tree harvesting, road building and winter recreation that result in loss of old-growth habitats, displacement through disturbance and reduced access to arboreal lichen, their main winter forage.

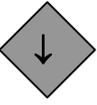
Figure 4. Trend of the Southern Mountain Caribou population inhabiting the Revelstoke portion of the Columbia Forest District, 1994 to 2006 (McLellan et al, 2006)



Terrestrial birds are the most diverse group of land vertebrates and are considered a valuable measure of ecosystem integrity. Neotropical songbird diversity is an important measure that has been monitored by biologists at the Skunk Cabbage site in Mount Revelstoke National Park from 1993 to 2002, using the Monitoring Avian Productivity and Survivorship (MAPS) methodology. Monitoring songbird populations over time allows scientists to better identify the proximate causes that affect terrestrial bird diversity, such as climate change, invasive species, altered disturbance regimes and habitat fragmentation, (Smith and Kashube, 2007).



This measure was rated as *good* and *stable* based on analysis of the 10 years of MAPS data on adult populations and productivity. Total adult populations of all species of terrestrial birds recorded at the Skunk Cabbage site increased by an average of 27 % over the monitoring period. At the same time, productivity increased for all species by an average annual increase of 0.021 % per year.



Indicator: Climate and Atmosphere

The climate plays a fundamental role in shaping the parks' ecosystems. Temperature, precipitation and snow pack are properties of climate that determine the distribution of flora and fauna, the frequency of natural disturbances such as wildfire, avalanches, forest insects and disease, the rate of glacier advance and retreat, and seasonal hydrology. There is now international consensus that these climate properties are changing at an unprecedented rate, and

that this can be attributed to greenhouse gases (carbon dioxide, methane and nitrous dioxide) that are released primarily as a result of human activity (IPCC, 2007).

Warmer temperatures and changes in precipitation in the Montane Cordillera Bioregion may shift the climatic suitability of vegetation northward and up in elevation, resulting in new assemblages of species in space and time (Columbia Basin Trust, 2006). Landscape level changes in vegetation can have profound impacts on wildlife with specialized ecological niches. Dramatic changes in the snow depth can affect wildlife movement during the winter. For example, Mountain Caribou need an increased snow depth to access their late winter food supply, arboreal lichens (primarily *Bryoria* species and *Alectoria sarmentosa*) in high elevation forests (MCTAC, 2002). Climate affects all aspects of a national park, but the factors that affect climate are global and regional in scale and consequently not responsive to management at a national park level. Adaptation and mitigation strategies will be required as changes occur.

The climate and atmosphere indicator evaluates four measures: temperature, precipitation, snow pack and glaciers. Datasets exist for these measures, but only for a limited number of years. Consequently, short-term weather trends and high variability make these data difficult to interpret. However, some preliminary trends corroborate regional analyses that indicate increasing temperature, decreasing snow pack, increasing variability in precipitation, and retreating glaciers in the Columbia Mountains region (Taylor, 2005). Snow pack is of particular interest to winter visitors of Mount Revelstoke and Glacier because of the potential impacts of climate change on the quality of backcountry skiing. Skiers, ski-area operators and agencies responsible for snow removal have observed recent changes in snow conditions in the region. The trends in Mount Revelstoke and Glacier snow pack data, including snow water equivalent and snow depth, are considered weak because they are not consistent across months sampled and between the snow courses sampled. All of the measures are assigned a declining trend in relation to their effect on ecological integrity. Parks Canada has not determined targets, thresholds, or reference conditions and a condition rating for this indicator cannot be assigned.

Table 3. Condition and trend ratings for Climate and Atmosphere measures

Measure	Condition/Trend
1. Temperature	
2. Precipitation	
3. Snow pack	
4. Glaciers	

The current retreat of glaciers provides highly visible evidence of the effects of a rapidly changing climate. The Illecillewaet Glacier (51°15'N, 117°30'W) in Glacier National Park was the first glacier to be studied in North America, and efforts to monitor it are continuing (McCarthy, 2000). The glacier has receded more than 1,110 meters between 1895 and 1995 (MLAP, 2002). Repeat

photography between 1887 and 2000 of the Illecillewaet Glacier clearly shows that the terminus has retreated substantially (Figure 5).

Overall, since 1850 glaciers in Glacier National Park have decreased substantially in surface area and length. In 1950, they were at their lowest levels, but they grew moderately from 1950 to 1978. Since 1978, they have remained relatively stable, except for a few lower elevation glaciers such as the Illecillewaet and Deville that have retreated significantly at their terminus (Ebbett, 2003). The relative stability of surface area and length of glaciers in Glacier National Park since 1978 is not necessarily an indication that glacier recession at higher elevations has not occurred. These glaciers may be rapidly thinning without substantially changing in surface area or length (Barry, 2006).

Figure 5. Terminus positions of the Illecillewaet Glacier based on historical photographs between 1887 and 2000. Note snowline in photo approximates terminus in 2000. (McCarthy, 2000).



 **Indicator: Aquatic Ecosystems**

The aquatic ecosystems of Mount Revelstoke and Glacier National Parks include rivers, streams, lakes and wetlands. Rainfall and meltwater from snow and glaciers replenish these water bodies directly or through groundwater inputs. A significant stressor to aquatic systems in the parks is the transportation corridor that includes the Trans-Canada Highway and the Canadian Pacific Railway. The corridor affects aquatic species of concern, including Coeur D'Alene Salamander, Western Toad and Westslope Cutthroat Trout through the physical alteration of rivers and streams. The corridor also fragments rare valley bottom aquatic habitat and acts as a conduit for the introduction of non-native plants that could dominate wetland areas. One pollutant in

particular, chloride, has increased in concentration and subsequently reduced water quality. Chloride effects from road salt application have been shown to extend outward between 200-1500m in aquatic systems (Forman and Deblinger, 2000). Road salt is contributing to the increased chloride levels detected in the Illecillewaet and Beaver rivers.

The Mount Revelstoke and Glacier National Parks Management Plan states that, “although the parks contain wetland habitat, the amount may be insufficient to attain ecological integrity at a regional scale.” Dams on the Columbia River have eliminated much of this habitat in the surrounding region. Consequently, the management plan sets targets for achieving ecological integrity in aquatic ecosystems and states that there will be no net loss of wetland habitat. Key actions are to maintain valley bottom processes adjacent to the highway and railway that create riparian habitat and wetlands, and to consider designs that reduce the need to cross or manipulate streams when making changes to transportation facilities.

Natural processes and human activities affect water quality. Soil erosion, bedrock weathering and wildfires can transport nutrients and minerals to water. At the same time, human activities, such as inadequate wastewater treatment and transportation corridor use, may add high quantities of these nutrients, or introduce other pollutants to these aquatic ecosystems. Another target in the Park Management Plan is that water quality must meet or exceed all applicable national or provincial standards for aquatic life and human health. Toxic spills and other contaminants must be cleaned up within 24 hours, and inputs to water sources must be monitored to determine whether they exceed benchmarks for aquatic life and humans.

The aquatic ecosystems indicator has been rated *good* but *declining* based upon the three measures in the table below. The human footprint in aquatic ecosystems refers to the treatment of wastewater in Mount Revelstoke and Glacier National Parks, which has seen an improvement in ecological integrity between 2001 and 2006. Water quantity (stream discharge) is one of the most important factors affecting the health of aquatic ecosystems (Lejback and Hayashi, 2005) because it determines depth of water, and the flow velocity at a given location, which in turn control temperature and turbidity. Burn (1994) concluded that the main change in stream flow as a result of climate change involves earlier spring runoff. This earlier runoff has been confirmed in a number of basins (Zhang et al., 2001). Data analysis showed a weak trend of declining peak flows and an earlier date for peak flows for both the Beaver and Illecillewaet rivers. As a result, water quantity has been rated in *good* condition with a *declining* trend.

Table 4. Condition and trend ratings for Aquatic Ecosystems measures

Measure	Condition/Trend
1. Human Footprint in Aquatic Ecosystems	
2. Water Quantity	
3. Water Quality	

The water quality measure is described in more detail because it is a good representation of the condition of the overall indicator. It has been sampled in cooperation with Environment Canada since 1987 at sites on the Beaver and Illecillewaet rivers in Glacier National Park. The water

quality index compares monitoring data to site-specific water quality guidelines for the protection of aquatic life.

The program assesses the levels of trace metals, nutrients, major ions, alkalinity, water temperature, air temperature, fecal coliforms and physical properties in order to rate the condition of the rivers. The water quality of both rivers is meeting the Park Management Plan target, and is assessed to be in *good* condition based on the Canadian Water Quality Index. However, an increase in dissolved chloride over time, particularly in the Beaver River, is an issue of concern.

Twenty years of detail shows that air temperature, water temperature, alkalinity and chloride levels are increasing over time. Some fish and aquatic communities cannot survive where there are higher concentrations of these variables (CCME, 2006). This provides the rationale for assigning a *declining* trend in water quality.



Indicator: Regional Landscapes

The regional landscapes indicator examines ecological influences occurring on a landscape level, some of which extend beyond park boundaries. At this time, the measures in this indicator focus on the fact that the parks are not large enough to provide sufficient, intact habitat for wildlife that have large home ranges, including Mountain Caribou, Grizzly Bear and Wolverine. Technologies such as geographic information systems (GIS), remote sensing and aerial photography are used to assess impacts and stressors.

Remote sensing of the greater ecosystem outside of Mount Revelstoke and Glacier provides data on landscape composition and forest fragmentation. Human settlement, road building and industrial development carve the landscape into small areas that may not provide sufficient food, cover and travel corridors for wildlife. Area of disturbance by fire is also reported as a landscape measure because of the large-scale impacts it has on the parks and the surrounding region. Fire suppression measures on provincial land and within Mount Revelstoke and Glacier National Parks may prevent fire from spreading to areas within the parks where, in some instances, its introduction would be of benefit to an ecosystem.

Overall, this indicator is rated as *poor*, and is showing a *declining* trend based on remote sensing and current knowledge of regional land use (See Table 5). Remote sensing conducted in 1997 shows a high rate of habitat loss and fragmentation in the area surrounding Mount Revelstoke and Glacier (Deuling et al., 1999).

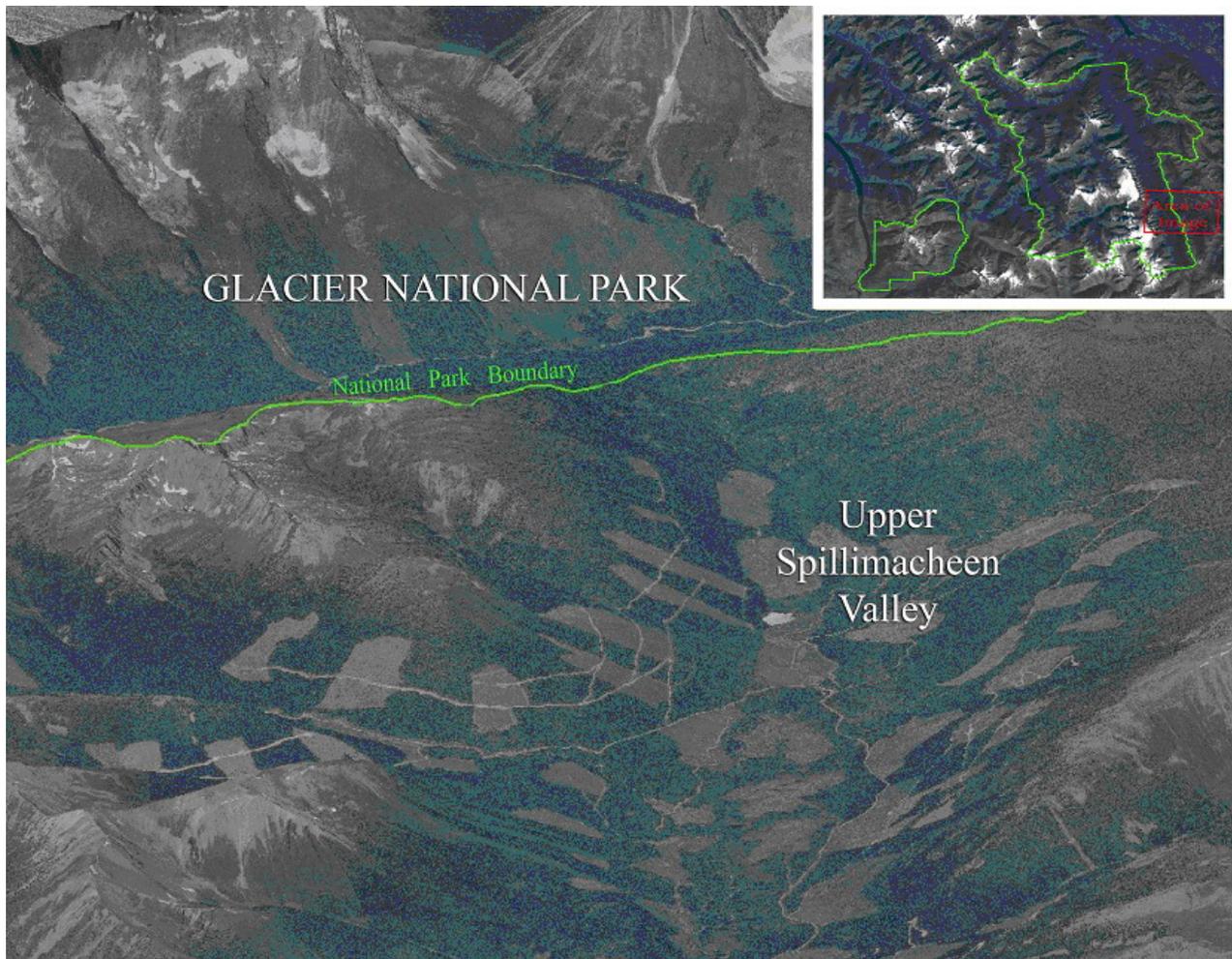
Figure 7 shows a 3-D GIS satellite image that provides a visual example of forest fragmentation in a portion of the greater Columbia Mountains ecosystem. As forest fragmentation increases over time, the greater ecosystem may be transformed into a fully fragmented ecosystem (Forman, 1995), where old forests exist only as isolated patches.

Habitat unit maps for 1975 and 1997 were generated using Landsat TM images and British Columbia Ministry of Forestry forest inventory data, and a comparative analysis was done between the maps (Deuling et al., 1999). A set of landscape pattern and configuration metrics was calculated and analyzed to measure the amount of change in fragmentation within the matrix of old-growth forests surrounding Mount Revelstoke and Glacier National Parks.

Table 5. Condition and trend ratings for Landscapes/Geology measures

Measure	Condition/Trend
1. Forest Fragmentation	↓
2. Landscape Composition	↓
3. Area of Disturbance by Fire	↓

Figure 7. An example of landscape fragmentation on part of the boundary of Glacier NP



Findings show that between 1975 and 1997, a loss of the closed canopy Engelmann Spruce-Subalpine Fir (ESSF) forest and Interior Cedar-Hemlock (ICH) forest was due to burns (17 %) and harvesting (83 %) outside the parks. The majority (81 %) of forest harvesting took place in the ICH, and most (93 %) of harvesting in the ICH occurred in mature and old forests (>140 years).

These metrics indicate that there are a greater number of forested patches decreasing in size and representing less core area overall in this landscape.

Mount Revelstoke and Glacier National Parks are nested in a greater regional ecosystem that has had significant alteration of landscape composition. The frequency of old, closed canopy forests has been reduced, and cutovers and immature forests have increased. This trend is particularly acute for ICH forest while at the same time the ICH occupies less than 20 % of the area in Mount Revelstoke and Glacier. This trend is detrimental for old forest wildlife species that require areas of habitat that are larger than the parks, or connectivity between old forest habitats within and outside of the parks. Increases in immature forest and recently disturbed areas may alter the composition of species using these habitats, further affecting the balance within ecosystems. This comparative analysis has resulted in a *poor* and *declining* rating for both landscape composition and forest fragmentation.

The 1997 habitat map will be used as a baseline against which future updates of disturbance features will be compared in order to monitor landscape changes over time.

Although there is enormous annual precipitation in this region, the climate in Mount Revelstoke and Glacier is conducive to fire because there are sustained periods of warm temperatures and low precipitation during the summer (Ketcheson et al., 1991). Under the current fire management regime in Mount Revelstoke and Glacier, fire frequency will continue to be low relative to the historical range of variation. However, all age classes are currently well represented in the age class structure of Mount Revelstoke and Glacier, and therefore the condition of fire disturbance is rated as *good*. Without some fire in the ICH forest, the early age class (0-40 years) of forest will soon be unrepresented in Mount Revelstoke and Glacier. This will have an impact on ecological integrity because early forests originating from burns provide habitat for a variety of species including Grizzly Bear (Apps et al. 2004), and various vascular plants and bryophytes. Therefore, the trend is considered to be *declining*.



Indicator: Terrestrial Ecosystems

Measures for the terrestrial ecosystem indicator include natural processes and development that occur on land. Several of the measures that are currently being assessed for the EI Monitoring program include non-native plants, forest insects and disease, and the development footprint. These measures all represent stressors to ecological integrity in terrestrial ecosystems.

Vegetation in Mount Revelstoke and Glacier National Parks requires natural processes that create disturbance (particularly avalanches, forest pathogens and fires) at periodic intervals in order to regenerate. Disturbance processes create a mosaic of vegetation and forest types at the landscape level. This variety contributes to native biodiversity.

Development-related activities can alter disturbance regimes resulting in negative ecological effects. Forest management practices and climate change can alter ecosystems and provide favourable conditions for the outbreak of forest insects or disease. Other activities such as road building and maintenance can damage or remove vegetation and reduce habitat values. The impact of past and potential future highway-related gravel extraction and pit development is a concern, as it alters habitat significantly. Disturbed areas also allow for the invasion of non-native plant species that can compete with native species for nutrients, sunlight and moisture. This can reduce native biodiversity and threaten the integrity of sensitive sites like wetlands.

Based on an assessment made by the Mount Revelstoke and Glacier National Parks vegetation specialist of the impacts of forest insects and disease, and non-native plants on the condition of terrestrial ecosystems, this indicator has been rated as *fair* and *declining*.

Table 6. Condition and trend ratings for Terrestrial Ecosystems measures

Measure	Condition/Trend
1. Forest Insect and Disease	↔
2. Non-native Vegetation	↓

Several insect species affect significant areas in Mount Revelstoke and Glacier including Black-Headed Budworm, Mountain Pine Beetle, Western Balsam Bark Beetle, Spruce Bark Beetle and Western Hemlock Looper. Western Hemlock Looper, (*Lambdina fissillaria lugobrosa*) is a destructive defoliator that feeds on the needles of Western Hemlock trees and causes thinning of the canopy, tree growth reductions and tree mortality. Looper outbreaks often cause heavy defoliation and high tree mortality over well-defined areas and make trees more vulnerable to attack by other insect pests (Alfaro et al., 1999). The photograph below shows the effects of a Western Hemlock Looper outbreak on a forest ecosystem.

Forest insects are natural disturbance agents in the forests of Mount Revelstoke and Glacier. Forest insects affect species composition, structure and ecosystem processes such as nutrient and energy cycles (Orwig et al., 1998). The impact associated with forest insects depends on their population size and the number of successive years of attack. Forest insect and disease survey (FIDS) data indicate that the size of recent outbreaks of major forest insects has been within the historic range of variability for such events in Mount Revelstoke and Glacier (Alfaro et al., 2007). For example, although Mountain Pine Beetle outbreaks are occurring in the British Columbia interior at an unprecedented rate in terms of spatial extent and severity, the impact on Mount Revelstoke and Glacier appears to be relatively minor and comparable to what has occurred historically.



However, White Pine Blister Rust (*Cronartium ribicola*) is a non-native fungus that causes mortality of Western White Pine and Whitebark Pine. In Mount Revelstoke and Glacier, Whitebark Pine is limited in distribution to high elevation ridges and mortality due to blister rust is a threat to populations of this tree species (Zeglen 2002). It is necessary to survey and monitor the extent of

the impacts of White Pine Blister Rust on Whitebark Pine. The forest insect and disease measure has been rated as *fair* with a *stable* trend.

In Mount Revelstoke and Glacier, many non-native plant species are abundant in disturbed front-country sites, including the transportation corridors (highways and railway), gravel pits, day-use areas, old park facilities and campgrounds (Boeckh, 2000, 2001; Dodge, 2002). Ten of the non-native species that occur in abundance in disturbed front-country sites are on the British Columbia Noxious Weed List. Several non-native species have invaded undisturbed areas such as riparian, dry bluff, and low elevation meadow habitat (Williston, 2005). Some of these areas are sensitive because they are ecosystems inhabited by rare plant species and are threatened by highway and railway impacts.

This non-native plant measure is rated as *fair* because of the low incidence of non-native plants outside of the highway corridor, but the trend is *declining* due to the invasion into rare ecosystems adjacent to the highway and railway.

Emerging Issues and Key Considerations for Ecological Integrity

- The ecological integrity monitoring program requires the establishment of more quantitative measures representing each indicator in order to more thoroughly assess the condition of the parks.
- Unlike other parks in the Montane Cordillera that are contiguous, Mount Revelstoke and Glacier National Parks are isolated from other protected habitats and wildlife corridors in the region. They do not provide sufficient habitat for wildlife with large home ranges and the habitat available outside the park is becoming increasingly fragmented. Protection of native species, especially species at risk such as Mountain Caribou, and habitats must be part of a regional cooperative effort.
- The Trans-Canada Highway and Canadian Pacific Railway line, and roads in general, are significant stressors on native biodiversity, climate and atmosphere, regional landscapes, and terrestrial and aquatic ecosystems. The impacts of transportation corridors need to be reduced or mitigated.
- Climate change is a concern. Photographic records show that glaciers are receding. Some data from Mount Revelstoke and Glacier National Parks support trends in temperature, precipitation and snow pack that experts say are attributed to climate change. The future impacts on the parks' ecosystems are not understood. The next revision of the park management plan needs to address climate change, potential impacts must be assessed and an adaptation strategy developed and implemented.
- Clearly communicating ecological integrity issues and engaging the public in park monitoring programs (e.g., through volunteer projects or as stakeholders) may help to ensure that issues are fully understood, and may help to garner support for park initiatives among visitors, adjacent communities, First Nations groups and regional partners.
- Mount Revelstoke and Glacier National Parks must reinforce and strengthen monitoring and research relationships with outside partners. This effort should include developing memoranda of understanding on data-sharing.

3.3.2 Cultural Resource Management

Parks Canada defines a cultural resource as a human work, or a place that gives evidence of human activity or has spiritual or cultural meaning, and that has been determined to be of historic value. This includes but is not limited to cultural landscapes, landscape features, archaeological sites, structures, engineering works, historic objects and associated records (Department of Canadian Heritage, 1994).

There are a variety of cultural resources in Mount Revelstoke and Glacier National Parks and Rogers Pass National Historic Site that tell a human story of more than 125 years. These include Level I cultural resources in Rogers Pass National Historic Site that are considered to be nationally significant, and other Level II cultural resources that are not of national significance but still have historic value, based upon historical, aesthetic or environmental qualities, regional or local association, provincial or municipal designations (Department of Canadian Heritage, 1994). Rogers Pass National Historic Site has a reporting protocol independent of the State of the Parks Report, so it will be dealt with only briefly in this evaluation. This report will address mainly the Level II cultural resources in Mount Revelstoke and Glacier National Parks, beyond the boundaries of Rogers Pass National Historic Site.



Due to data limitations, including lack of recent inventories and evaluation, trends will not be reported for cultural resource measures and indicators.

Indicator: Resource Condition

Thirty-five archaeological sites or landscape features have been documented in the two parks, including resources affiliated with railway construction, mountaineering, logging, mining, the Nakimu Caves, a World War I internment camp and a work camp for conscientious objectors in World War II. The Nels Nelsen ski jump in Mount Revelstoke National Park (1914-1971) was considered to be one of the best jump sites in the world. Although archaeologists have not found any tangible evidence of pre-contact First Nations occupation or use of Mount Revelstoke and Glacier National Parks, research continues. A total of 13,283 historical artifacts have been catalogued. There are three historic buildings recognized by the Federal Heritage Building Review Office (FHBRO) in the parks and six others that will be reviewed in the future. Parks Canada archaeologists, historians, collections management specialists, GIS database specialists, a cultural resource management specialist and other staff provide support in maintaining the integrity of these invaluable resources. The condition of cultural resources in Mount Revelstoke and Glacier National Parks is rated as *fair*. While the condition of some resources is adversely affected by environmental conditions, significant recent progress has been made toward protecting cultural landscapes, buildings and archaeological sites.

Table 7. Condition ratings for Resource Condition measures

Measure	Condition
1. Landscapes and Landscape Features	
2. Buildings and Structures	
3. Objects	
4. Archaeological Sites	

Archaeological sites, and some landscapes and landscape features are declining in condition because of environmental factors such as avalanches, rockfall, vegetation encroachment and water erosion that have not been mitigated. Nels Nelsen ski jump is an historical resource that requires protection against vegetation encroachment, soil erosion and damage to rock installations. Archaeologists conduct annual field trips to record heritage resources at Rogers Pass and other sites in the parks.

The condition of most buildings and structures is good. Recent actions have been taken to restore and stabilize Glacier Circle Cabin, a FHBRO designated building (see photo above). Mitigative measures have been implemented to protect the Loop Brook Pillars and the Cascade Creek Bridge.

The majority of objects have been catalogued, and are protected at the Rogers Pass Discovery Centre, the Parks Canada administration office in Revelstoke, or the Western and Northern Canada Service Centre in Calgary and Winnipeg.



Indicator: Selected Management Practices

Several inventories document the description, location and condition of cultural resources for the parks. Cultural resource management issues are addressed in the Park Management Plan, the Heritage Presentation Renewal Action Plan, the Visitor Experience Strategy, the Law Plan and the Business Plan. The five-year capital program for Mount Revelstoke and Glacier National Parks shows a firm commitment to strengthening the cultural resources program and improving the condition of these resources. A Mountain Park Cultural Resources Management Advisory Board was formed in 2007 to identify priorities for funding, as well as to administer capital funds within the seven mountain parks. The selected management practices indicator is rated *fair* (See Table 8).

Level II cultural resources are inventoried, but Level II landscape features and archaeological sites have not been inventoried or assessed (including the Nels Nelsen ski jump and Internment Camp). FHBRO buildings, archaeological resources and landscape features require conservation plans in order to define the necessary measures for stabilizing or improving the condition of the resources.

Table 8. Condition ratings for Selected Management Practices measures

Measure	Condition
1. Inventory and Evaluation	
2. Management Actions	

The Cultural Resource Management Plan should be updated. Cultural resource management (CRM) training has been provided to staff. The Environmental Assessment process is applied to any physical interventions in cultural landscapes or archaeological sites. Capital funds have been directed towards stabilization of cultural resources and renewal of cultural resource messages and media.

Emerging Issues and Key Planning Considerations for Cultural Resource Management

- The Mount Revelstoke and Glacier National Parks Cultural Resource Management Plan should be updated to provide renewed strategic direction.
- Level II heritage buildings should be inventoried and recorded, and conservation strategies should be developed.
- Cultural resource inventories (ARDA, BHRDA, FHBRO, AIS)¹ should be completed and updated on a regular basis.
- Archaeological sites and landscape features under threat from environmental conditions should be monitored, and a management approach should be developed.
- Increased involvement with the Cultural Resource Management Advisory Board may increase collaborative opportunities with the five other mountain parks.

3.4 Visitor Experience

Mount Revelstoke and Glacier National Parks have offered visitors opportunities for memorable experiences for a century. The mountain landscapes of western Canada have changed dramatically since Glacier National Park was established in 1886, but most of the park is still primitive and wild, unchanged from the time it was first explored by Major A.B. Rogers. Mount Revelstoke National Park was established in 1914, and was being used for hiking, camping mountaineering and skiing for more than a decade before that. The backcountry in both parks still offers an historic legacy of wilderness opportunities (challenge, exploration, solitude) that were pioneered by adventurers at the turn of the 20th century. The Meadows in the Sky Parkway has offered mountain-top road access since the 1920s, and other road-accessible visitor opportunities in the parks are concentrated along the national transportation corridor. Mount Revelstoke and Glacier National Parks are places where visitors can experience nature on its own terms.

¹ Archaeological Resource Description and Analysis (ARDA), Built Heritage Resource Description and Analysis (BHRDA), Federal Historic Buildings Review Office (FHBRO) and Artifact Information System (AIS).

For more than 30 years, Mount Revelstoke and Glacier National Parks have been managed in a fashion that integrates all aspects of Parks Canada's mandate. Opportunities for visitors to directly experience and learn about park resources have been recognized as critical and essential to the success of natural resource conservation. The cultural resources of Rogers Pass National Historic Site and other cultural sites within the parks are integrated fully with management of the national park landscape and the provision of visitor opportunities. Every road-accessible visitor area in the two parks offers an opportunity for visitors to have a short walk and learn more about the natural and cultural settings that they are experiencing. Remote backcountry settings that many visitors will never experience directly are depicted through multiple media at the visitor centre.

The parks have a reputation for excellence in visitor opportunities, facilities and services, as indicated through the results of visitor research. The challenge for the future is to continue to exceed visitor expectations in the 21st century. Maintaining an understanding of our visitors and their needs is essential to ensuring that visitors continue to enjoy, benefit from and learn about the parks.

Indicators

Parks Canada is developing four national indicators to measure the state of visitor experience: understanding visitors; providing opportunities; quality service; and connecting visitors personally with the place. This program is new and evolving, and standardized measures and monitoring programs have not yet been developed to support the indicators. While some data are available, in most cases the evaluation of indicator condition and trend is based on professional judgement. New methods of data collection will be required to accurately report on these indicators in future State of the Park Reports.

This State of the Parks Report represents the first opportunity to view visitor experience in Mount Revelstoke and Glacier National Parks in terms of these indicators. Except for visitor satisfaction, no targets are available for these indicators. There are trend series data for visitors entering the park and using facilities such as campgrounds, the information centre, the scenic parkway and trails. Other data rely on comprehensive exit surveys such as the 2005-2006 Patterns of Visitor Use study or Visitor Information Program (VIP) research tools. Past intermittent surveys, which were used for other purposes, are of limited value to broadly assess visitor experience. A limited amount of information is available related to the indicator connecting visitors personally with the place.



Indicator: Understanding Visitors

In order to set the stage for a memorable experience, Parks Canada must first understand its visitors (their characteristics, visitation trends and how and whether these visitors can be segmented to better target opportunities for memorable experiences), as well as potential new markets.

This indicator is rated as *good* and *improving*. There is a good understanding of visitors to the two parks, and that knowledge continues to improve each year. Much of the information for this indicator is derived from the latest social science research project – the 2005-2006 Patterns of Visitor Use study, as well as previous visitor research projects and annual park visitation statistics. This includes Visitor Information Program surveys conducted since 1994, backcountry



visitor surveys conducted since 1997, the 1998 Visitor Exit Survey and the visitor information elements of media evaluations conducted since 1997.

Total visits to Mount Revelstoke National Park and Glacier National Park have continued to increase slowly over the past decade, with an annual growth of 1% to 2% (See Table 9). These parks are very important to international tourists, with 65 % of visitors coming from the United States or overseas during the summer months. Of the overseas visitors, more than half come from Germany, Switzerland and the Netherlands. British Columbians (11 %), Albertans (9 %) and Canadians from other provinces (8 %) make up the remaining summer visitor segments, by place of origin. More than 75 % of the parks' western Canadian visitors are repeat visitors, while most American and overseas visitors have not been to the parks previously. Foreign visitors make up 50 % of the camping parties at the three front-country campgrounds.

Table 9. Mount Revelstoke and Glacier National Parks visitation

Mount Revelstoke and Glacier NP	2004/05	2005/06	2006/07
Total visitors	591,280	606,159	611,173

Rogers Pass has become recognized as one of North America's premier ski-touring areas, and winter visitor statistics are much different from the snow-free months. British Columbians are the largest group in winter (31 %), followed by Americans (26 %) and Albertans (24 %). Despite the tremendous travel distances, 11 % of winter visitors come from overseas. Over the past few poor winters in Europe, more and more Europeans have traveled to Rogers Pass to ski-tour. Although winter visitation is much smaller than summer visitation in terms of absolute numbers, it has grown by 50 % over the past five years. With the tremendous population growth in Alberta and the British Columbia interior, and the corresponding growth in backcountry recreation, this trend is expected to continue.

Visitors to Mount Revelstoke and Glacier have been segmented in a number of ways, including experience expectations, behaviour characteristics, activities, place of origin, and visit duration. For example, the needs and expectations of groups such as backcountry skiers, vehicle campers and German-speaking visitors have all been studied in detail.

Most visitors to Mount Revelstoke and Glacier seek the benefits associated with a leisure experience or relaxing getaway experience. These *Leisure Seekers* are often looking for

opportunities for rest, rejuvenation, socialization, kinship, contemplation, exercise, escape, peace and privacy. They expect a relatively comfortable and convenient national park experience. *Leisure Seekers* participate in a wide range of activities, including camping, walking, picnicking, nature study and interpretive programs, primarily in front-country areas of the parks. *Leisure Seekers* are the majority users of park services during the snow-free seasons.

Adventure Recreationists are a smaller group of visitors who expect to experience varying degrees of risk, excitement and freedom, and to be personally challenged in some way. They seek a sense of exhilaration, self-reliance, achievement and exploration, most often in a setting of remoteness, solitude and escape. They participate in a range of activities, including backcountry camping, hiking, ski touring, caving, mountaineering and ice climbing. These users are focussed primarily on backcountry areas, although they will seek out the resources specific to their activity regardless of the setting (eg. ice waterfalls). They include visitors who day-hike or ski in backcountry areas that are easily accessible from the highway, as well as visitors on multiple-day adventures in remote areas of the parks. *Adventure Recreationists* tend to use basic services such as trails, trailhead washrooms, campsites, shelters and information services during the summer months. During the winter, they are the dominant users of park services, including avalanche information and safety registration.

Another small group of visitors are those seeking *Discovery and Learning* opportunities as the main purpose of their park stay. They want to attain varying levels of understanding of the parks' resources, either through leisure activities or in association with professional or scholarly pursuits. More small-scale ecotourism operators catering to this group have begun to visit in recent years. Elderhostel groups are typical of this segment, as are school groups and many of the visitors who take part in campground educational programs. These visitors often have high expectations of staff being available to spend time with them, either individually or through participation in heritage interpretation programs.

In addition to those visitors who stop and enjoy the parks, four million *Through-Travelers* enter the parks on the Trans-Canada Highway each year, en-route to other destinations. These travelers do not stop in the parks for any purpose other than washroom breaks or fuel. Year-round, most *Through-Travelers* are Albertans en-route to British Columbia destinations, and British Columbians en-route to Alberta and points east. *Through-Travelers* represent a potentially large, untapped audience for park messages and experiences. A number of changes have been made to better connect with *Through-Travelers*, such as welcome stations at park boundaries, improved highway signs, and low power radio broadcasts.

The 2005-2006 Patterns of Visitor Use study used a latent class model to identify segments based on the behaviour characteristics associated with a visit to the parks. This technique recognizes that visitors do not necessarily fall neatly into one segment - they may exhibit the behaviours of more than one segment on any given visit. Individual visits to Mount Revelstoke and Glacier have been grouped into four behavioural categories and profiles: premium experience visits, habitual/familiar visits, flow-through visits and casual experience visits.



Indicator: Providing Opportunities

Mount Revelstoke and Glacier National Parks and Rogers Pass National Historic Site provide a wide variety of opportunities for people to enjoy and appreciate their natural and cultural heritage. Trip planning and arrival information services such as welcome stations, publications,

exhibits, websites, and personal services are designed to offer visitors a menu of opportunities that allows them to customize their park experience.

This indicator is rated as *good* and *improving*. A significant investment of park fee revenue and capital funds over the past decade has improved the range and quality of visitor opportunities available and the levels of service offered in both parks. Visitor satisfaction with the opportunities provided is high (see Table 10).

Mount Revelstoke and Glacier are enduring symbols of the Canadian wilderness, where visitors experience a strong sense of place and visitor opportunities are of the highest quality. More than 90 % of the area of the two parks is wilderness. This wilderness provides backcountry visitors with a spectrum of opportunities, from day-hikes on backcountry trails to multi-day backpacking routes, icefield crossings and “bush-whacking” exploration in remote untracked areas. A range of basic facilities is provided to support these visitor experiences, including 18 trails, nine designated backcountry campsites and four alpine huts. Several trails have been redesigned or relocated to reduce the potential for conflict with bears and to improve the visitor experience. Efforts are made to minimise trail closures due to the presence of bears or natural hazards. Trail maintenance has been discontinued in three major backcountry watersheds, allowing the valleys to return to trail-less wilderness.

The parks’ reputation for deep powder skiing draws visitors who are looking to experience excitement, challenge, risk and freedom in the parks. Many new areas of Glacier have been opened to skiing over the last decade under the Closed Area Permit system, which allows controlled access to skiing areas when highway avalanche control is not planned. The amount of skiing terrain available has been continuously refined through the permit system, and the avalanche hazard safety information program has been expanded in recent years.

Because Mount Revelstoke and Glacier are very rugged wilderness parks, the majority of visitor use is concentrated in front-country areas along the Trans-Canada Highway, near Illecillewaet, Loop Brook and Mt. Sir Donald campgrounds, and on the Meadows in the Sky Parkway. The Rogers Pass Discovery Centre is the springboard to exploration in the two parks and national historic site.



The Meadows in the Sky area in Mount Revelstoke is the only place in a Canadian national park where visitors can reach the summit of a mountain by vehicle. Visitors experience every life zone in the Columbia Mountains eco-region as they switchback up the mountain on the Meadows in the Sky Parkway. Every day use area in the two parks offers learning opportunities, with three major interpretive boardwalks (Giant Cedars, Skunk Cabbage and Hemlock Grove) and 10 other self-guiding trails.

Visitors can also experience the story of Rogers Pass National Historic Site at seven other day-use facilities in the 20 km historic corridor within Glacier National Park. The park’s front-country campgrounds are located entirely within the national historic site, which has provided unique opportunities to expose park visitors to the site. Historic site campfire talks and heritage strolls are popular features at Illecillewaet Campground. It is also probable that Rogers Pass holds the distinction of being the Canadian national historic site most visited by *Adventure Recreationists* (ski-tourers, cavers, mountain climbers and backpackers).

A number of areas are experiencing crowding and congestion during the peak summer season hours, including the Meadows in the Sky summit area, Giant Cedars day-use area, the Illecillewaet trailhead parking areas, the Summit of Rogers Pass day-use area and the Rogers Pass Discovery Centre. There are also indications that skiers and boarders perceive crowding in the Illecillewaet and Asulkan, Connaught Creek, Hermit and Loop Brook backcountry areas, and trailhead parking lots are often very crowded in winter. Research is planned to determine the impact of crowding on the perceptions of visitors in these areas.

Summer visitors who responded as part of the 2005-2006 Patterns of Visitor Use study, reported the following levels of participation in activities:

walking and hiking (short hikes)	39%	attending interpretive programs	11%
viewing exhibits/getting information	37%	picnicking	7%
sightseeing	28%	wildlife/bird viewing	6%
walking and hiking (long hikes)	22%	backpacking	1%

During the winter months, respondents reported that they participated in:

backcountry skiing	64%	cross-country skiing	6%
viewing exhibits	23%	snowshoeing	4%
sightseeing	7%		

Visitors from overseas, other parts of Canada and the United States are much more likely to take short or long walks or hikes in the parks than residents of British Columbia and Alberta. Respondents from every place of origin viewed exhibits and went sightseeing in the parks. Visitors from other parts of Canada and the United States were much more likely to attend interpretive programs than other visitors.



Indicator: Quality Service

This indicator is rated as *good* and *improving*. There is a good understanding of visitor perceptions of service quality in Mount Revelstoke and Glacier, as well as an understanding of visitor perceptions of the benefits that they attained through their park experience. The information for this indicator is derived primarily from the 2005 and 2006 Patterns of Visitor Use study, as well as the Visitor Information Program surveys conducted since 1994. Knowledge of visitor satisfaction with service quality continues to increase each year. Parks Canada’s goal is to deliver consistently high quality services that meet or exceed visitors’ needs and expectations. The national target is 85% of visitors being satisfied with their visit, and at least 50 % being very satisfied. In Mount Revelstoke and Glacier, 94 % of visitors were satisfied with their visit (scoring 4 or 5 on a scale of 1 to 5) and 63 % of visitors rated their visit as extremely enjoyable (scoring 5 on a scale of 1 to 5).

Visitors also ranked the benefits achieved as a result of their park visit very highly. Visitors from British Columbia gave the highest mean satisfaction score to “experiencing the natural outdoors.” Albertans gave the highest score to “being in a peaceful, quiet place.” Other Canadians were most satisfied with the opportunities to “experience the natural outdoors” and “enjoy an escape from the ordinary.” Visitors from overseas and the United States also gave the highest mean satisfaction score to “experiencing the natural outdoors.”

Table 10. Visitor satisfaction with opportunities, facilities and services
(2005/06 Patterns of Visitor Use Study)

Examples of Satisfaction with Benefits Achieved as a Result of Visitor Opportunities	Mean Score (1 to 5)*
experience the natural outdoors	4.6
enjoy an escape from the ordinary	4.5
be in a peaceful, quiet place	4.5
spend time with my friends and family	4.4
have a recreational experience	4.3
have a learning experience	4.1
explore the backcountry of the parks	4.0

*scale of 1 to 5, 5 being very satisfied and 1 being not at all satisfied

Examples of Satisfaction with Visitor Facility and Service Attributes	Mean Score (1 to 5)*
campground staff friendliness and courtesy	4.9
overall staff courtesy	4.8
campsite cleanliness	4.8
overall staff friendliness	4.7
official language services	4.6
the visit as a memorable experience	4.6
staff knowledge	4.6
the Rogers Pass Discovery Centre	4.6
the visit meeting expectations	4.5
service quality	4.5
self-guiding trails	4.5
interpretive exhibits and programs	4.3
value for entrance fee	4.2
"Selkirk Summit" publication	4.0



Indicator: Connecting Visitors Personally With the Place

Parks Canada's objective in this area is to provide opportunities that are reflective of and appropriate to national parks and national historic sites, and to facilitate meaningful, personal connections with these heritage places. This is often referred to as "place attachment" or "place bonding".

The concept of "Connection to Place" is under development, and measures are not yet defined for this indicator. Parks Canada has no specific data for Mount Revelstoke and Glacier National Parks so this indicator is *not rated*. However, there is much anecdotal evidence of place attachment available for Mount Revelstoke and Glacier. Guest book commentary has been collected for 25 years or more, at locations such as the Rogers Pass Discovery Centre, Giant Cedars Boardwalk,

Loop Brook Trail, Asulkan Cabin, Glacier Circle Hut and the Meadows in the Sky Trail. Many repeat visitors have a long personal history of visiting these locations, and strong place attachments appear to exist (based on personal commentary in the guest books). Even first-time visitors are often able to ascribe spiritual value to park locations, evidence of the initial stages of place attachment. Guest books frequently reveal the deep significance that people assign to special places (e.g. "Giant Cedars Boardwalk is a stroll through nature's great cathedral", or "The top of Mount Revelstoke feels like a part of me").



Research is planned to determine the degree of public attachment to specific places in Mount Revelstoke and Glacier National Parks, cross-referenced to such variable scales as use history, spirituality opportunities, motivations and behaviours. Social science researchers have developed models for mapping landscape values and place attachment that will also be tested in the two parks.

Research in the United States and Australia indicates that personal contact with knowledgeable staff in park settings helps to create lasting connections and positive place attachment. In Mount Revelstoke and Glacier, park staff knowledge, courtesy and friendliness, as well as the availability of opportunities to speak to staff are among the most highly-ranked satisfaction indicators in recent visitor research projects.

Opportunities for personal accomplishment or growth, such as climbing a mountain or learning something new, also contribute to memorable experiences and have the potential to create place attachment. The 2005 and 2006 Patterns of Visitor Use Study found that visitors gave high rankings to every type of benefit that they had sought when choosing to visit the parks (e.g. enjoying the natural outdoors, having a learning experience, being in a peaceful quiet place).



Linkages between protected places and the visitor's own culture or landscapes further facilitate understanding and connection. Since the 1970s, Mount Revelstoke and Glacier have been very popular destinations for visitors from Germany, Switzerland and other alpine nations of Europe. A 1996 survey of Germanic language-speaking visitors indicated that residents of alpine European nations made strong personal connections with the landscapes of Mount Revelstoke and Glacier. Most respondents

in the 1996 survey were struck by the dramatic differences in land-use in the Alps and the Columbia Mountains, despite the geographic similarities between the regions.

Another potential measure of place connection or place attachment is the level of visitor understanding of the importance and value of a place. The first measurement of visitor understanding began a decade ago when surveys were carried out at the discovery centre and three main interpretive boardwalks. In pre-visit and post-visit surveys, visitors were able to

correctly answer more questions about the parks' resources after visiting the discovery centre and boardwalks. Roughly 70 % of visitors surveyed were able to correctly express main interpretation themes after visiting the discovery centre in 1998. In the 2005 and 2006 Patterns of Visitor Use study, visitors correctly answered half of the heritage resource questions in a post-visit survey. Mean scores for British Columbians and Albertans in 2005 and 2006 were significantly higher than visitors from other parts of Canada, overseas or the United States.

Another means of gauging potential personal connection is the likelihood of a repeat visit from regional residents, which is relatively high in the case of Mount Revelstoke and Glacier. Of the visitors surveyed in 2005 and 2006, 81% of British Columbian visitors and 77 % of Albertan visitors were making return trips to the parks. In contrast, 61 % of other Canadians, 68 % of Americans and 86 % of overseas visitors were on their first trip to Mount Revelstoke and Glacier. During the winter, 73% of park users are repeat visitors, which may be an indication of some degree of place attachment to Rogers Pass.

Emerging Issues and Key Planning Considerations for Visitor Experience

- Visitation in Mount Revelstoke National Park, Glacier National Park and Rogers Pass National Historic Site continues to grow, increasing 21 % since 1997. The majority of visitors during the snow-free months are from the United States (19 %) or overseas (53 %), and the parks remain critically important to international tourism in the Columbia Mountains region. Most international visitors are making their first trip to the parks.
- There has not been an indication from visitors that they desire new, expanded or different types of experiences than those currently offered in the parks. Many improvements to existing opportunities, facilities and services have been made over the past decade. Visitors appear to make informed choices in seeking the rustic, wilderness-oriented camping, sightseeing, learning, hiking and skiing experiences that are available in the two parks. Those visitors looking for a different range of experiences tend to stay with tourism partners in the surrounding region and make day trips to the parks.
- Significant investment of park fee revenue and capital funds over the past decade has improved the quality of visitor opportunities available and the levels of service offered. With many improvements complete, most visitor requests now tend to focus at the specific service or facility level rather than the experiential level (eg. additional frontcountry campsites).
- Recommendations in the Backcountry Avalanche Risk Review have been implemented in Mount Revelstoke and Glacier National Parks. New safety information and trip planning services promote avalanche education and preparedness at the Rogers Pass Discovery Centre and backcountry trailheads. Additional off-site safety information is available through the website, community events, school programs and the mass media, as well as the Canadian Avalanche Association website and training programs.
- Tourist services in the Columbia Mountains region (eg. accommodation, food services, information centres, museums, guiding services) have continuously upgraded over the past decade and offer a range products and services to park visitors.
- As neighbouring Revelstoke Mountain Resort develops over the next 25 years, the demographics of the local community are expected to change slowly but dramatically. Population growth will likely lead to additional use of the national parks and increase

pressure on park services, particularly in the backcountry. Ongoing gathering of market intelligence about these “new locals” will aid greatly in future investment decisions, and may identify potential experiential learning opportunities in the parks.

- New Canadians also represent a potential market for the parks. Populations of new Canadians are concentrated in the relatively distant urban areas of the Okanagan and Thompson valleys and will require a determined effort to raise awareness of Mount Revelstoke and Glacier. Newly retired Canadians represent another potential new segment of visitors. The influx of retirees settling in the Okanagan, Thompson, Shuswap and Kootenays is creating a market for leisure time activities within two to three hours driving time of home. Existing marketing links with the City of Revelstoke and B.C. Rockies Tourism will assist in reaching these audiences.

3.5 Public Education

For most visitors, a trip to a national park is a departure from their daily routine and an opportunity to learn something new. Parks Canada and its partners provide information, opportunities, services and facilities so that people can have safe, enjoyable and rewarding learning experiences.

In Mount Revelstoke and Glacier, opportunities for visitors to directly experience and learn about park resources have been recognized as critical and essential to the success of natural and cultural resource conservation. Every road-accessible visitor area in the two parks offers an opportunity for visitors to have a short walk and learn more about the natural and cultural heritage of the area. Visitors can also learn about remote backcountry settings that most will never experience directly, through multiple media at the Rogers Pass Discovery Centre. Educational programs in the parks are available for school and youth groups, adult organizations and commercial groups such as Elderhostel.

Canadians can also learn about Mount Revelstoke and Glacier without actually visiting the parks directly, through special events in communities, outreach programs, classroom programs, publications and websites. Educational opportunities help people to connect to these special places, and build support for their continued preservation.

Indicators

Parks Canada is developing four national indicators to measure the state of Public Education: Understanding Audiences, Extending our Reach, Facilitating Understanding, and Influencing Attitudes. They are still in development and no measures have yet been determined. New methods of data collection will be required to accurately report on these indicators in the future.

As with Visitor Experience, this State of the Parks Report represents the first opportunity to review public education in Mount Revelstoke and Glacier National Parks in terms of these indicators. Only a limited amount of information is presented, as it is not yet possible to report on some specific conditions related to the indicators.

Some indications of the general use of and satisfaction with public education services are available through the 2005-2006 Patterns of Visitor Use study. Other data are available through the evaluations of heritage presentation media that have been carried out over the past decade. No data are currently available about the total number of people who are reached by the various

forms of communication programming offered by Mount Revelstoke and Glacier National Parks. Similarly, there has not yet been any social science research carried out to determine the long-term influence of communications on values, attitudes, understanding and behaviour.



Indicator: Understanding Audiences

Traditional methods of public education have been re-examined in Mount Revelstoke and Glacier as shifting visitor needs and expectations have been revealed through social science research and visitor observation. Most of the learning opportunities in the parks have been revitalized over the past few years, based both on audience feedback and evaluations of heritage presentation media.

This indicator is rated as *good* and *improving*. There is a good understanding of Mount Revelstoke and Glacier audiences, and that knowledge continues to improve each year. The information for this indicator is derived primarily from the 2005-2006 Patterns of Visitor Use study, as well as Visitor Information Program surveys conducted since 1994, the 1998 Visitor Exit Survey, and the visitor information elements of media evaluations conducted since 1997. Details on park visitor audiences are found in the “Understanding Visitors” section.



The 2005-2006 Patterns of Visitor Use study confirmed that for many park visitors, discovery and learning activities are elemental to their park experience. While most visitors don't make the decision to visit based solely on the availability of interpretation services, viewing exhibits and getting information was the single most popular year-round park activity for survey respondents. A total of 37% of summer visitors to the parks viewed interpretive exhibits on self-guiding trails, viewpoints or campgrounds. This is higher than participation in walking, hiking and sightseeing.

The Rogers Pass Discovery Centre is the only interpretation facility open during the winter, yet 23% of all winter visitors still viewed interpretive exhibits. During the winter the Discovery Centre is used predominantly by backcountry skiers, and 40 % of these users spent time viewing the exhibits or films. On average, visitors to the Rogers Pass Discovery Centre spent almost half of their time in the building viewing exhibits and films.

Viewing exhibits is the number one activity for British Columbian and Albertan visitors, and the number two activity for other Canadians, Americans and visitors from overseas. Walking on short trails was the most popular activity for visitors from other parts of Canada, the United States and overseas. Those visitors were also exposed to park messages as all short trails in the parks have on-site exhibits. The relatively high number of visitors viewing exhibits has remained consistent for the past 20 years. In contrast visitor attendance at personal interpretation programs is lower, as most visitors do not budget the time to take in a program during their visit, and there is only a small number of personal programs offered during the summer months. An average of 10 % of all park visitors attend interpretation programs, although that number is significantly higher for visitors from other parts of Canada and the United States. Table 11 highlights the level of visitor satisfaction with learning opportunities.

**Table 11. Visitor Satisfaction With Learning Opportunities
(2005-2006 Patterns of Visitor Use Study)**

Overall Visitor Satisfaction with Learning Activities	Mean Score (1 to 5)*
self-guiding interpretive trails	4.5
education/interpretation programs	4.3
education/interpretation exhibits	4.3
availability of education/interpretation activities	4.0

* scale of 1 to 5, 5 being very satisfied and 1 being not at all satisfied

In addition to research data about independent park visitors, there is also a good anecdotal understanding of the student and curriculum needs of school groups who visit Mount Revelstoke and Glacier National Parks or participate in classroom programs. There is still only a limited knowledge of “virtual visitors”. Information is available about numbers of website contacts and take-up of park publications outside of the park, but we do not have data about members of the public who express interest in the parks without actually visiting.



Parks Canada alone cannot reach all visitors to Mount Revelstoke and Glacier National Parks. In addition to contact with park staff and interpretive media, most visitors also have contact with other agencies, tourism businesses and the travel media. This indicator is rated *fair*, as Parks Canada does not yet have full data on the numbers or profiles of potential visitors who use the park website to plan a trip, visitors who contact other agencies, or visitors who contact tourism businesses around Mount Revelstoke and Glacier National Parks. This indicator is rated as *improving* as the results of the 2005-2006 Patterns of Visitor Use study now offer some insights into the extension of Parks Canada’s education and information reach.

Table 12. Pre-visit Information Sources (2005-06 Patterns of Visitor Use Study)

Pre-visit Information Sources Utilized by Visitors (Examples of off-site sources of information)	Percentage of visitors using the source
travel guidebooks	40
Parks Canada website	30
regional maps	23
provincial highway map	20
travel clubs	13
Tourism BC website	10
Tourism BC vacation planner	8
Parks Canada mountain guide	8
Parks Canada vacation planner	5

There are many tourism businesses in the nearby communities of Revelstoke and Golden, and one business based inside the park at Rogers Pass. Some of these businesses provide park information and pre-trip planning assistance to potential park visitors, and a few backcountry and tour group companies offer first-hand educational experiences inside the parks. The Friends of Mount Revelstoke and Glacier also offer a small menu of educational programs and events in and near the parks. There are currently no data on the educational or information reach of businesses or third parties inside or neighbouring the parks. Because there is limited information and interpretation services provided by others, the parks provide a high level of direct staff contact with visitors in the parks. The parks have also worked with the Mountain Park Heritage Interpretation Association to develop certified training programs for guides offering tours in Mount Revelstoke and Glacier, and a “Best of Revelstoke” training program is available for local tourism operators.

Staff of Mount Revelstoke and Glacier National Parks work with provincial and regional organizations, such as Tourism BC, the Columbia Mountains Institute, the B.C. Rockies destination marketing organization, and media organizations, to extend the reach of park messages. The park offers familiarization tours and story ideas for travel writers. A partnership with the Alberta Motor Association results in annual mountain park information inserts in 450,000 copies of *Westworld* magazine. Park staff work with the mass media (newspaper, radio, television and film-makers) to extend the reach of park messages. This includes participation in joint ventures with the British Columbia Knowledge Network on a species at risk television program and DVD, with CBC Okanagan Television on promotion of Rogers Pass National Historic Site, and with local radio stations on delivery of avalanche safety messages. Message reach in the winter season is also extended through the services and educational programs of the Canadian Avalanche Centre. Mount Revelstoke and Glacier has a very positive relationship with the local newspaper, which offers a regular column space for national park and site stories.

Working together, the mountain national parks have pioneered a new web-based survey tool called “ParksListens.” Over 3500 visitors have signed up to participate in on-line discussion panels on a number of park issues, such as environmental education and camping. This has established a new two-way dialogue with a “virtual” audience.

Parks Canada also wants to reach out to Canadians where they live and has identified three priority markets: youth, those living in urban areas and new Canadians. The Parks Canada in Schools program, and the on-line *Teachers Corner* resource, extends the reach of national park and national historic site public education programs into the nation’s schools. In British Columbia, five lesson plans specific to Parks Canada, and 100 curriculum links have been developed. Mount Revelstoke and Glacier currently offer a menu of eight classroom and on-site programs aimed at young people and linked to the British Columbia school curriculum. These programs will be adjusted regularly according to Parks Canada in Schools and BC curriculum guidelines.

Almost 80 % of Canadians live in urban areas² and about 18 % of Canadians were not born in Canada (expected to rise to 30 % by 2026). New Canadians represent a potential market for the parks’ extension and outreach services and in the longer term, potential on-site visitors. Parks Canada would like to raise awareness of Mount Revelstoke and Glacier National Parks in the urban areas of the Okanagan Valley (primarily Vernon, Penticton and Kelowna) and the Thompson Valley (primarily Kamloops) where there are large concentrations of new Canadians.

² Statistics Canada defines an urban area as having a minimum population of 1,000 with a population density of at least 400 persons per square kilometre.

The links between Asian and East Indian railway labourers and Rogers Pass National Historic Site may give new Canadians in these groups a connection to Canadian history.



Indicator: Facilitating Understanding

Mount Revelstoke and Glacier National Parks facilitate public understanding of the natural and cultural heritage of the parks through educational and interpretive programming and through partnerships with local organizations.

“Facilitating understanding” is a new national indicator, and data are still limited. While it is relatively simple to measure immediate, short-term visitor knowledge gained during a park experience, it is much more difficult to measure long-term, sustained changes in personal understanding. This indicator is rated *fair* and *improving*, as some limited social science research has been conducted in Mount Revelstoke and Glacier.

The first measurement of visitor understanding began a decade ago when surveys were carried out at the discovery centre and three main interpretive boardwalks in Mount Revelstoke and Glacier. In pre-visit and post-visit testing in 1998, visitors were able to correctly answer more questions about the parks’ resources after visiting the discovery centre and boardwalks.



Research at the Rogers Pass Discovery Centre was designed to reveal the effectiveness of exhibits in conveying principal messages and their effectiveness in attracting and holding visitor interest. After visiting the discovery centre, 70 % of visitors were able to correctly express main interpretation themes.

The research results were used to revitalize the exhibit hall over the past five years, including changes to visitor flow patterns through the centre and development of new history and ecology exhibits.

In the 2005-2006 Patterns of Visitor Use study, visitors answered correctly half of the heritage resource questions in a post-visit survey. Mean scores for British Columbians and Albertans were significantly higher than those for visitors from the rest of Canada, overseas or the United States.

These early studies do not provide adequate measures for this indicator, but they do reveal that there is some immediate knowledge and understanding gained after contact with a Parks Canada message. An initiative in Banff National Park, known as the Eco-integrity Project, is expected to bring a common, more robust methodology to the measurements for this indicator.

There are currently no data on the efficacy of the parks’ eight curriculum-related school programs, the programs offered by the Friends of Mount Revelstoke and Glacier, or off-site learning opportunities such as community events and the park and site websites.

“Influencing attitudes” is also a new national indicator that is still under development. Parks Canada has no specific data related to this indicator for Mount Revelstoke and Glacier National Parks. As a result, this indicator is *not rated*.

Like the previous indicator, it is difficult to measure long-term, sustained change in personal attitudes after a national park experience. There is some anecdotal information that Parks Canada is able to have some success in influencing public attitudes. Strong communication programs appear to have been helpful in the public reception of new policy developments (eg. avalanche information program, avalanche closure areas, restrictions on custodial groups), operational changes (eg. visitor group size restrictions in Balu Pass) and crisis communications (e.g. closures of the Trans-Canada Highway for mudslides, icestorms and serious motor vehicle accidents). General public acceptance of these situations may be an anecdotal indication of Parks Canada communications having had a positive influence on public opinion.

Emerging Issues and Key Planning Considerations for Public Education

- The majority of summer visitors to the two parks are interested in learning opportunities. Viewing heritage presentation exhibits and getting information was the most popular park activity, with 37 % of visitors participating year-round. High levels of participation and satisfaction indicate these are effective means of meeting Parks Canada’s public education goals.
- The majority of summer visitors to Mount Revelstoke and Glacier are from the United States (20 %) or overseas (45 %). 56 % of American and 49 % of overseas summer visitors have been exposed to Parks Canada learning opportunities in Mount Revelstoke and Glacier, and may carry conservation messages to other parts of the world.
- Significant investment of park fee revenue and capital funds over the past decade has improved the range and quality of learning opportunities available in the parks in response to increasing demand. The parks now offer an enlarged menu of school programs and special events, and improvements have been made to learning experiences at numerous locations throughout the parks. Requests for improvements to educational opportunities now tend to focus at the service level (e.g. additional personal interpretation programs, additional school programs).
- Mount Revelstoke and Glacier National Parks continue to explore opportunities for the use of new communication technologies to deliver messages to Canadians at home.
- Mount Revelstoke and Glacier National Parks continue to work with key communications partners to explore and offer participatory learning experiences in the community (e.g. Chickadee Nature Festival, Revelstoke Ed-ventures and Railway Days).

4.0 COMMON MOUNTAIN PARK ISSUES

Although each park has some specific characteristics that are not shared with the others, there are enough similarities that a number of issues common to most parks have been identified in the State of the Park Reports.

- Each park has species at risk. Grizzly bears have been the focus of management action for the last 10 – 15 years and continue to require attention. The precarious situation of caribou populations has become critical in recent years in Banff, Jasper, Mt. Revelstoke and Glacier National Parks, and throughout their range in Alberta and British Columbia.
- Roads, railways, effluent, water diversions and impoundments affect aquatic ecosystems in all parks. The natural characteristics of many waterbodies have been altered by a legacy of fish stocking with non-native species.
- Terrestrial ecosystems have been modified by a legacy of fire suppression. Currently, non-native plant species account for up to 10 % of all plant species in a park. Invasive species are threatening native biodiversity in some locations.
- Climate change is affecting all parks and is most noticeable in glacier recession. Long term monitoring will help identify impacts on ecological integrity, and influence decisions about what can or should be done to mitigate, or adapt to, impacts. The recent expansion of mountain pine beetle populations and the decline in caribou populations may prove to have been influenced by climate trends in addition to other factors.
- Cultural heritage has frequently been secondary in national park management. The rich legacies of past associations with the mountains, such as thousands of years of aboriginal history preserved in archaeological sites, and the protection of cultural artifacts, provide opportunities for broadening the stories that are told.
- Although there are fluctuations, visitor use of all parks is stable or slowly increasing. Much of the increase is attributable to the growth of the regional population rather than to international visitors. Coupled with other domestic demographic characteristics – an aging population, a growing urban population, a wider diversity of cultural backgrounds, an increasing proportion of first generation Canadians and a prediction of an overall decline in the Canadian population – the trends require more social science research to guide park management responses.
- Comparatively little is known about the effectiveness of public education programs. The combination of changing visitor characteristics and rapidly evolving technology presents both challenges and exciting new opportunities for sharing the parks' natural and cultural heritage with more visitors, both on site and in their homes. Many are repeat visitors and many visit several parks. Programs will have to respond to these circumstances.
- Changing land uses surrounding the parks require continued multi-jurisdictional approaches to issues such as the protection of species at risk and the control of forest insects and disease. The increased area in the provincial park systems in Alberta and British Columbia has provided an increased area of complementary park management.

5.0 EVALUATION OF MANAGEMENT ACTIONS

Parks Canada takes an integrated approach to the protection of ecological and cultural resources and provision of quality visitor experiences and educational opportunities. Planning initiatives and management actions in Mount Revelstoke and Glacier National Parks respect the relationships between these aspects of the Parks Canada mandate. The Mount Revelstoke and Glacier National Parks Management Plan provides a framework of actions that integrate these components.



The success of these management actions is evaluated using effectiveness monitoring data, and is reported in this State of the Parks Report. This effectiveness monitoring program is still being developed. Most of the actions described in Table 13 are based on qualitative evaluations, as many actions are recently implemented or ongoing and have not been formally evaluated. More specific measurement and reporting of results is anticipated as long term monitoring programs are further developed and sufficient time has passed in order for the effects of actions to be determined. Table 13 highlights actions and results related to key strategies, initiatives, targets and indicators presented in the 2005 Park Management Plan. Two examples presented in the boxes below illustrate the integrated delivery of the Parks Canada mandate.

Renewal of Learning Experiences

The visitor opportunities provided in frontcountry settings in Mount Revelstoke and Glacier National Parks provide good examples of Parks Canada's integrated mandate. As a result of renewal efforts over the past four years, all frontcountry visitor facilities in the parks now provide ecological or cultural resource-related exhibits. These learning opportunities present the results of ecosystem research and cultural resource messages in an engaging and accessible manner. Heritage presentation opportunities have been designed to fit the expectations, motivations and time constraints of park and site visitors.

Improving visitors' understanding of ecological issues within and beyond the national parks is a key Parks Canada objective. New exhibits at the Rogers Pass Discovery Centre profile species at risk and biodiversity. The Giant Cedars day-use area includes new exhibits related to old growth forests and associated wildlife species like mountain caribou. Exhibits at the Skunk Cabbage day-use area introduce the theme of global ecological connectedness through the stories of neo-tropical migratory birds. The Illecillewaet Campground provides interpretive exhibits that chronicle a century of scientific evidence of the impact of climate change on the parks' glaciers and icefields.

Cultural resource messages are also a significant part of the recent improvements to learning opportunities in Mount Revelstoke and Glacier National Parks. A series of new exhibits at the Meadows-in-the-Sky day-use area, including the First Footsteps Trail (Aboriginal stories), the Koo Koo Sint (David Thompson) trail and the historic fire tower, focus on the cultural heritage of the area. The redevelopment of the historic Nels Nelsen ski jump in Mount Revelstoke National Park provides another opportunity for meaningful learning experiences for visitors, including new interpretive media. Rogers Pass National Historic Site has also been the subject of increased attention through improved learning opportunities at visitor facilities within the site, including the Rogers Pass Discovery Centre, Illecillewaet Campground, day-use areas and interpretive trails.

The new learning opportunities created in Mount Revelstoke and Glacier National Parks complement the existing quality visitor opportunities provided at day-use areas, campgrounds and trails, improving the overall experience for visitors as well as enhancing their connections to the national parks.

Contaminated Site Remediation

Mt. Revelstoke and Glacier National Parks have a long history of providing services to visitors and travelers using the national transportation corridor, which includes the Trans-Canada Highway and Canadian Pacific Railway mainline. That history includes a legacy of contaminated sites related to past maintenance and operational practices. In recent years, Parks Canada has taken an aggressive approach to addressing contaminated sites in order to mitigate environmental risks and improve ecological integrity.

The Parks Canada maintenance compound at Rogers Pass has been a focus of contamination remediation efforts since 2005. The site presents significant environmental and logistical challenges, with hydrocarbon contamination occurring in soils and groundwater adjacent to Rogers Creek. Work to date has included removal of contaminated soils, treatment of contaminated groundwater and installation of a network of groundwater monitoring wells to ensure that remediation efforts are successful over the long-term. The work also involved restoration of riparian vegetation along Rogers Creek and installation of a barrier fence to ensure that there is no future encroachment of operational activities into the riparian zone. Parks Canada has developed a plan to re-contour areas of the maintenance compound to ensure that storm-water runoff and any associated contaminants are collected and treated before they can reach the natural environment. This work is scheduled for implementation in 2008.

In addition to the remediation work undertaken at the Parks Canada compound, work has begun at a contaminated site discovered on the opposite side of the Trans-Canada Highway at Rogers Pass. Soil and groundwater sampling work has been undertaken in order to delineate the extent of contamination and to develop a plan to remediate the site in 2008. Similar sampling, delineation and risk assessment work has taken place at the Beaver Pit, an old landfill site in Glacier National Park.

These recent efforts, along with the establishment of a Parks Canada working group to address operational practices in the context of an environmental management strategy, are expected to reduce environmental risks associated with past, present and future operations within Mt. Revelstoke and Glacier National Parks.

Table 13. Summary of challenges/opportunities, past and current management actions, and results in Mount Revelstoke and Glacier National Parks

Challenge/Opportunity	Management Actions	Results
Improve understanding and mitigation of the ecological impact of the Trans-Canada Highway, and the railway	<ul style="list-style-type: none"> • Established a transportation advisory committee • Cleaned up contaminated site and restored stream at the Rogers Pass Compound • Remediated the Mount Fidelity dumpsite and burn pit at Mount Revelstoke 	Increased the set of best practices to deal with concerns about mortality, wildlife connectivity, salt and abrasive use, toxic spills, run-off, railway tunnel noise, air pollution, cultural resources and to identify access improvements for visitor facilities.
Meet or exceed all environmental standards in the operation of the Trans-Canada Highway	<ul style="list-style-type: none"> • Developed and implemented a Salt Management Plan (2004) • Conducted an inventory of highway culverts impairing aquatic connectivity and small mammal travel patterns (2007) • Consulted with Department of Fisheries and Oceans on activities impacting streams 	<p>Reduced the amount of salt entering the environment by adopting best salt handling practices, and using new technologies to ensure its most effective use over the road system.</p> <p>Increased efforts to improve water quality adjacent to highways.</p>

Challenge/Opportunity	Management Actions	Results
<p>Meet or exceed all environmental standards in the operation of the Trans-Canada Highway (continued).</p>	<ul style="list-style-type: none"> • Set reduction targets for greenhouse gas emissions by 5.2% from 1998/99 levels by 2010 for Highway Service Centre. 	<p>Reduced the need to cross or manipulate streams and make it easier for wildlife to cross corridors.</p> <p>Reduced the impact on native fish populations.</p> <p>Reduced the carbon load of Mount Revelstoke and Glacier National Parks operations.</p>
<p>Exchange information about the issues that Mount Revelstoke and Glacier National Parks face in achieving ecological integrity and the importance of parks in the context of the larger regional ecosystem</p> <p>Improve the health of the larger ecosystem through cooperation with other land managers.</p>	<ul style="list-style-type: none"> • Worked with local snowmobile clubs to develop snowmobile maps. • Worked with University of Calgary on climate monitoring. • Collaborated with Environment Canada and the BC Ministry of Environment on water quality analysis and Canadian Aquatic Biomonitoring Network (CABIN) aquatic invertebrate monitoring. • Collaborated with the Canadian Wildlife Service on migratory bird study. • Collaborated with the Ministry of Forests, LINKS group and City of Revelstoke, Species at Risk Coordination Office (SARCO) on Mountain Caribou issues. • Collaborated with First Nations on ecological integrity issues including stream management and contaminated sites. 	<p>Broadened the base of partnerships with First Nations, environmental organizations, protected areas, industry, government agencies, recreational clubs and ecotourism groups.</p>
<p>Maintain intact habitats and natural processes to support a self-sustaining biological community.</p>	<ul style="list-style-type: none"> • Completed Predictive Ecosystem Mapping (PEM) map of Mount Revelstoke National Park. • Conducted rare plant surveys (2002-2005). • Conducted study on the Coeur d'Alene Salamander's habitat requirements. • Conducted an inventory, and controlled non-native plants in priority areas. 	<p>Developed maps of environmentally sensitive sites.</p> <p>Developed a non-native plant monitoring protocol (ongoing).</p>
<p>Recognize and develop appropriate strategies for management of visitor impact on ecological and cultural resource integrity.</p>	<ul style="list-style-type: none"> • Implemented trail counter program (2002-2007). • Conducted Canadian Avalanche Centre Backcountry Recreational User Survey (2006) and Patterns of Visitor Use study (2005-2006). 	<p>Developed a human use database identifying summer and winter trends in visitor use of trails in Mount Revelstoke and Glacier National Parks.</p>

Challenge/Opportunity	Management Actions	Results
<p>Preserve, protect and present cultural resources.</p>	<ul style="list-style-type: none"> • Implemented FHBRO building stabilization, vegetation removal and stabilization of ruins. • Protected and restored Glacier Circle Cabin. • Developed Nels Nelsen historic ski jump area plan and installed new heritage presentation media. • Implemented David Thompson Bicentennial initiatives (Koo Koo Sint Trail, publications, traveling exhibit). • Installed new on-site heritage presentation media throughout Rogers Pass National Historic Site. • Conducted oral histories (eg. avalanche control, mountaineering, surveying, etc.). • Implemented First Footsteps Self-guiding Trail partnership with three First Nations. 	<p>Reduced the loss of or damage to significant cultural resources caused by natural processes.</p> <p>Improved the visitor experience at Glacier Circle Cabin and increased recognition of its historic significance in local communities.</p> <p>Improved public understanding of, and appreciation for, historic places, people and events.</p> <p>Strengthened ties between the parks and local communities.</p> <p>Created new opportunities for First Nations people to present their stories in Mount Revelstoke and Glacier.</p>
<p>Offer a range of opportunities for enjoyable, meaningful and memorable experiences, supported by safe, well-maintained, low key, unobtrusive visitor facilities and services</p>	<ul style="list-style-type: none"> • Actively encouraged visitors to explore under-utilized facilities and quieter seasons, and to participate in activities that do not require additional infrastructure, by improving trip-planning and arrival information that promotes alternative visitor opportunities (eg. learning travel, shoulder season travel). • Continued the program of targeted reinvestment in campgrounds, day-use areas, trails, trailheads, bridges, washrooms, the scenic parkway, the visitor centre, information services and heritage presentation. • Upgraded the Rogers Pass water treatment and wastewater treatment plants. • Installed potable water treatment systems at the campgrounds and two main day use areas. • Evaluated and analyzed trails in Grizzly Bear habitat and implemented improved trail design. Implemented hiking restrictions on Balu Pass Trail during times of high Grizzly Bear use and increased the level of public communications. 	<p>Visitation growth has been accommodated in areas that can sustain additional use.</p> <p>Both the supply and demand of recreational opportunities in the parks remains a close match as visitation continues to grow.</p> <p>Popular areas of the park did not become excessively crowded.</p> <p>Visitors perceived their park experience as worthwhile, memorable, and of high quality.</p> <p>Visitor satisfaction with their park experiences has remained very high.</p> <p>Visitors were able to see their park pass fees being reinvested in services that they use</p> <p>All water sources meet Canadian Drinking Water Standards and downstream wastewater targets</p> <p>Conflicts between bears and people decreased in number.</p>

Challenge/Opportunity	Management Actions	Results
Place a high priority on public safety incident prevention and visitor self-reliance.	<ul style="list-style-type: none"> • Redeveloped the winter backcountry safety communications program, including installation of new trailhead and discovery centre media, website improvements and development of avalanche terrain ratings for backcountry skiing areas. • Implemented the Mount Revelstoke and Glacier National Parks Public Safety Plan. 	The frequency and severity of public safety incidents decreased, based on improved visitor decision-making and informed choices in risk situations.
<p>Communicate the national ecological and cultural significance of the parks to visitors and stakeholders.</p> <p>Ensure that opportunities for learning are a significant element of every visitor experience.</p>	<ul style="list-style-type: none"> • Replaced outdated heritage presentation media at high use visitor areas, and continued the revitalization of personal programming. • Developed learning experience programs with the Friends of Mount Revelstoke and Glacier National Parks, Ktunaxa, Secwepemc and Okanagan First Nations, Columbia Mountains Institute, Revelstoke Railway Museum and Okanagan College. • Continued the delivery of communications messages through multiple media approaches (eg. on-site exhibits, Selkirk Summit/Mountain Guide/Glacier Country publications, three park and site websites, personal programs, audio-visual media and special events, and local news media). • Explored new communication technologies (eg. soundscape exhibits, on-site broadcasting). • Continued outreach programming to local communities through events and significant places. • Continued the delivery of curriculum-based school programming through the Parks Canada in Schools initiative. • Created the First Footsteps Trail, in partnership with the Ktunaxa, Secwepemc and Okanagan First Nations. 	<p>Increased the number of people offered a learning experience, through new on-site exhibits, the new Rogers Pass NHS website, and through community partners.</p> <p>All park/site interpretation services contain ecological or commemorative integrity messages.</p> <p>Potentially increased the understanding of the parks' natural and cultural values, regional and local issues affecting the ecological integrity of the greater ecosystem, the need for sustainable management on adjacent lands, and the role of protected areas in preserving biodiversity and species at risk.</p> <p>Renewed heritage presentation services throughout the parks and site.</p> <p>Visitor satisfaction with their park experiences has remained very high, and they saw their park pass fees being reinvested in interpretation services that they use.</p> <p>Relevance, support and understanding of national parks by youth and local audiences were potentially increased.</p> <p>Relationships were enhanced and First Nations stories were presented to national park visitors.</p>

6.0 SUMMARY ASSESSMENT

The following discussion summarizes the key issues identified in the Mount Revelstoke and Glacier National Parks of Canada State of the Park Report, and evaluates whether the current Park Management Plan adequately addresses areas of concern. Where appropriate, recommendations are provided regarding issues that may require additional attention during the upcoming review of the Park Management Plan.

The state of ecological integrity is considered to be generally fair with a declining trend. However, some indicators and measures are rated poor and many show declining trends, indicating that there are several challenges and opportunities for improvement.

The long-term viability of some regional wildlife populations such as Mountain Caribou and Grizzly Bear remains uncertain as a result of many pressures, including development-related habitat loss and fragmentation, and increased recreational activity with related wildlife displacement from important habitat. Many of these concerns are exacerbated by the fact that Mount Revelstoke and Glacier National Parks are isolated from other protected areas, and are subject to ecological pressure from outside park boundaries. Within Mount Revelstoke and Glacier National Parks, the Trans-Canada Highway and Canadian Pacific Railway mainline are significant contributors to ecological integrity concerns.

Vegetation resources within the park are being adversely affected by the spread of Western Hemlock Looper, which causes heavy defoliation and tree mortality, often in important caribou habitat. Non-native plants and habitat loss are a concern, particularly in disturbed front-country areas adjacent to the transportation corridor. Highway-related construction and maintenance activities contribute to vegetation impacts within the parks. Potential future expansion of gravel extraction activities may warrant consideration in the review of the Park Management Plan.

Regional scale impacts to vegetation composition and related habitat fragmentation concerns are significant, as the extent of forest harvesting, road building, recreational development and human settlement increases on adjacent lands.

Aquatic ecosystems are faring relatively well in Mount Revelstoke and Glacier National Parks, with an overall good ecological integrity rating. The lack of major development nodes or town sites along the park rivers, combined with ongoing improvements to existing wastewater treatment facilities, contribute to this positive situation. Chloride levels are gradually increasing, possibly as a result of winter salt use on the highway, warranting ongoing vigilance to ensure that water quality remains good.

Although there is a lack of long-term local data to confirm climate trends and considerable uncertainty regarding the specific impacts of climate change on local ecosystems, concern regarding climate-related indicators and measures is warranted. Regional study results support changes in climate and indicate potentially significant ecological changes. The Park Management Plan review should consider strategies to monitor and adapt to changes in climate.

The current Park Management Plan recognizes the majority of these threats to ecological integrity and identifies various strategies and actions to address them. As discussed in the preceding section, many actions have been initiated and are expected to result in long-term improvements.

Overall management of cultural resources in Mount Revelstoke and Glacier National Parks, including Rogers Pass National Historic Site, is considered to be progressing relatively well with

an overall fair condition rating. Stabilization work has improved the condition of many cultural landscapes, archaeological resources and buildings. Other features, like the Nels Nelsen ski jump require additional attention to complete the stabilization of resources. Inventories and a Cultural Resource Management Plan exist, but are somewhat incomplete and out-of-date.

The existing Park Management Plan recognizes the cultural resource management issues identified in this report and presents several actions to address known deficiencies. The Park Management Plan review could consider additional actions to update existing cultural resource inventories, monitoring processes and plans.

The general condition of visitor experience in Mount Revelstoke and Glacier National Parks is considered to be good with an improving trend. Significant investments over recent years have built on a solid foundation of quality experiences, opportunities and visitor facilities. Overall visitation to the parks has increased by 21 % over the last decade, a possible reflection of the high quality of the visitor experiences available. Visitor surveys indicate a high level of satisfaction with the experiences and services provided in the parks.

Public education in Mount Revelstoke and Glacier is considered to be in fair condition overall with an improving trend. A wide variety of new and revitalized interpretive and educational opportunities are available throughout the parks, at campgrounds, day use areas, the discovery centre and on trails. Many educational opportunities are also provided outside of the parks, through educational outreach programs, community events, publications and websites. Parks Canada has a good understanding of the audiences that visit the parks, but less data on “virtual visitors”. Limited research has been conducted into the long-term effectiveness of communication services in facilitating public understanding and appreciation of the parks.

Continued implementation of existing strategies and actions in the current Park Management Plan should maintain the positive conditions and trends related to visitor experience and public education. Refinement and implementation of the performance measurements suggested in the Park Management Plan would be another positive step.

This State of the Park Report confirms the importance of developing a consistent, comprehensive and scientifically rigorous monitoring program to measure and report on progress related to ecological integrity, culture resource protection, visitor experience, and public education objectives. The existing Park Management Plan provides a framework for development of the program. The Park Management Plan review should consider the need for refinements in order to ensure a consistent and effective monitoring program is developed.

Finding ways to better connect Canadians and international visitors to Mount Revelstoke and Glacier National Parks in order to improve understanding, appreciation and support for national parks is an ongoing challenge for Parks Canada. The Mount Revelstoke and Glacier National Parks State of the Parks Report concludes that there are opportunities for improvement to ecological integrity, cultural resource management, visitor experience and public education that, when addressed in an integrated fashion, will help to meet that challenge.

The existing Park Management Plan recognizes the majority of the issues identified in this report, and in most cases the plan provides appropriate direction to address those challenges and opportunities. While many actions have been implemented, continued progress and long-term monitoring are required to ensure successful outcomes. In some cases, this report highlights specific areas that may benefit from additional attention as part of the upcoming management plan review.

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