KOOTENAY

NATIONAL PARK OF CANADA

State of the Park Report

April 2008

Parks Canada Parcs Canada

Canada

EXECUTIVE SUMMARY

The Kootenay National Park of Canada State of the Park Report (2008) represents the Parks Canada Agency's first effort to present a comprehensive evaluation of the state of the three key elements of Parks Canada's mandate: resource protection, visitor experience and public education. The primary purposes of the report are to:

- provide an analysis of the state of the park regarding ecological integrity and cultural resources, visitor experience and public education;
- report on the results of management actions in respect to resource protection, visitor experience and public education;
- 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 relationships; and
- communicate the state of the mandate 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 table below.

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 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 Kootenay National Park in 2008.

The following symbols are used in this report:

Condition		**Trend**	
Good: the condition of the indicator/measure is satisfactory	●	*Improving*: the condition of the indicator/measure is improving.	↑
Fair: there is concern regarding the state of this indicator/measure	▼	*Stable*: the condition of the indicator/measure is not changing.	↔
Poor: the condition of the indicator/measure is poor or low	■	*Declining*: the condition of the indicator/measure is declining.	↓
Not rated: there is insufficient information to determine condition	◆	*Not rated*: 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. In the 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	↔	Overall, the condition of this indicator is rated as *fair* with a *stable* trend. However, the populations of some wide-ranging species like grizzly bears are of concern. Highway mortality is a significant threat to many wildlife species.
Climate and Atmoshpere	↓	Mean temperatures are increasing, snowpack is decreasing, and glaciers are receding. Reference conditions and targets have not yet been determined, so this measure is not rated.
Aquatic Ecosystems	↔	The general condition of aquatic ecosystems is rated as *good* with a *stable* trend. Water quality and quantity reflect the expected range of natural variation. Aquatic connectivity is a concern, as some highway culverts hinder or block fish movement.
Terrestrial Ecosystems	↓	This indicator is rated as *fair* with a trend toward *decreasing* ecological integrity. Past management practices, such as wildfire suppression, have contributed to significant forest insect and disease concerns. The extent of non-native plants in the park is increasing as a result of human activity and development.
Regional Landscape	↔	This indicator is rated as *fair* with a generally *stable* trend. Steady growth in regional population and ongoing development adjacent to the park are creating ecological pressures within the park through increased traffic and access from provincial lands. Large wildfires and prescribed burns have mitigated landscape scale impacts somewhat by improving habitat conditions and diversity.

Heritage Resource Protection		
Cultural Resource Management (CRM)[1] and Palaeontological Sites		
Resource Condition	▼	Cultural resources are generally in *fair* condition. Some mitigative actions have been taken to reduce threats to the integrity of cultural resources. Monitoring and conservation measures for Level II resources are undertaken relatively infrequently, as Level I resources have recently been a higher management priority. No trend is assigned due to data limitations.
Selected Management Practices	■	Knowledge of the state of existing cultural resources is incomplete. Inventories are generally out-of-date, and lack of an up-to-date Cultural Resource Management Plan hinders overall management of Level II resources. This indicator is rated in *poor* condition. No trend is assigned due to data limitations.

[1] National Historic Sites (level 1 resources) are not included in this evaluation, as they are subject to separate management plans and reporting requirements.

Visitor Experience (VE)		
Understanding Visitors	↑	Of the approximately 400,000 visitors to Kootenay National Park each year, over half are from Canada. Approximately half of Kootenay visitors use the parks on a repeat basis. Social science research continues to improve our understanding of park visitors.
Providing Opportunities	↔	A wide range of visitor opportunities is available, from personal group interpretation to wilderness experiences offering solitude and adventure. However, some assets require attention, and 13% of facilities are rated in poor condition. Efforts will continue to renew visitor assets and infrastructure. More evaluation is required to determine if these offerings are meeting the needs and expectations of a changing market.
Quality Service	↔	Parks Canada wants at least 50 % of visitors to be "very satisfied" with their visitor experience. In the Mountain National Parks, 82 % of visitors surveyed in 2003 rated their park experiences as "extremely enjoyable".
Connecting with Place	◆	Memorable park experiences often stem from having an emotional bond to the place. Some information on this new indicator is presented, but data are too limited to provide a condition rating.

Public Education (PE)		
Understanding Audiences	↑	Recent surveys show that repeat regional park users have a low participation rate in park learning activities. More evaluation on other park audiences is required.
Extending our Reach	↑	Training is provided to commercial sector employees so they can provide useful and accurate information to visitors. A variety of outreach activities are aimed at residents of the Columbia Valley in British Columbia.
Facilitating Understanding	↔	Kootenay National Park uses a range of methods to facilitate understanding, including interpretive programs, non-personal media, certification of commercial guides and World Heritage Interpretive Theatre. Survey results indicate an average fair result for the level of visitor understanding of key messages.
Influencing Attitudes	N/R	Studies indicate that continued public education might be an effective strategy for changing perceptions and gaining public acceptance of park management actions. More social science research is required at the park and national levels.

Ecological integrity within Kootenay National Park is generally considered to be *fair*, indicating that concern is warranted. The overall trend is *stable*. Several individual measures are considered to be in *poor* condition, and some indicators and measures show *declining* trends. The long-term viability of some regional wildlife populations such as grizzly bear and badger remains uncertain as a result of many pressures arising both from within and outside of the park. Within the park, highway mortality and reduced habitat effectiveness are of concern in areas adjacent to the highway corridor and related nodes of development. Habitat loss related to development, habitat fragmentation related to forest harvesting and road development, and increased human activity on adjacent provincial lands contribute to these concerns.

The overall state of cultural resource management in Kootenay National Park also represents a challenge for Parks Canada. The recent focus of cultural resource management efforts has been on National Historic Sites, which are not included in this evaluation. The Level II cultural resources represented in this report have been a lower management priority, which is reflected in the *fair* to *poor* ratings.

While less quantitative data are available to rate visitor experience and public education, some general trends for those key elements can be inferred**.** Both elements have recently received increased attention and resources from Parks Canada in recognition of their importance in connecting Canadians and international guests to the national parks. Parks Canada acknowledges

that unless public understanding, appreciation and support for Canada's national parks are maintained, the future of our parks and their ecological integrity will be uncertain.

Visitor experience in Kootenay National Park is rated as *fair* with a *stable* trend overall and there are opportunities for improvement. Progress has been made in recent years to restore visitor opportunities affected by major wildfires in 2003 and to improve outdated visitor facilities, which is expected to build on an existing foundation of relatively high visitor satisfaction levels.

While there has also been progress in updating and improving educational programs and information sources within and outside of the park, public education is generally considered to be in *fair* condition with an *improving* trend.

The Kootenay National Park of Canada Park Management Plan presents a range of strategies to address previously identified ecological, visitor experience and public education challenges. Many of those challenges are highlighted in this report. Since the Park Management Plan was approved in 2000, many actions arising from those strategies have been implemented or are underway. These include:

- Decommissioning of outdated Parks Canada and commercial accommodation facilities in important wildlife habitat in the Redstreak bench and Sinclair Canyon areas.
- Improvements to visitor facilities and interpretive media at popular frontcountry locations, including the Radium visitor centre, the hot pools, and various day use areas.
- Restoration of open forest and grassland habitat through forest thinning and prescribed burning, particularly in the Redstreak bench area. Extensive wildfires in the northern portion of the park have made significant contributions to habitat restoration objectives.
- Restoration of visitor facilities and opportunities affected by 2003 wildfires, including bridges, trails, day use areas, campgrounds and a backcountry lodge.
- Improvements to popular backcountry campgrounds, including new food storage and eating facilities to reduce potential bear conflicts.
- Development of a management plan and inventory for Kootenae House National Historic Site.
- Improved collaboration with First Nations, including increased presentation of aboriginal heritage at the Radium visitor centre.

Cumulatively, these and other actions are expected to result in improvements to ecological integrity, visitor experience and public education in Kootenay National Park. 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.

The existing Park Management Plan addresses the majority of the issues identified in this report and in most cases provides appropriate direction to address these challenges and opportunities. In some cases, the Kootenay National Park State of the Park Report highlights specific areas that may benefit from additional attention as part of the upcoming management plan review. Of note is that visitor experience is approached largely from an asset-based rather than experiential perspective. Identifying key areas that can be addressed in an integrated way to improve resource protection, visitor experience and education represents an opportunity for improvement.

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1.0 INTRODUCTION

Parks Canada Agency is pleased to report to Canadians on the current condition of Kootenay National Park of Canada. Based on monitoring and research information, the State of the Park Report provides an assessment of the key areas of Parks Canada's mandate: heritage resource protection, visitor experience, and public education. This is the first such report for the park.

State of the park reporting will be completed every five years in conjunction with the review of the Park Management Plan. The Kootenay National Park Management Plan was approved in 2000 and reviewed in 2003. The next review is scheduled for 2008 in order to coordinate the management planning cycles for the mountain national parks (Kootenay, Banff, Mount Revelstoke, Glacier, Waterton Lakes, Yoho and Jasper).

The purposes of the State of the Park Report are to:

- provide an analysis of the state of the park regarding ecological integrity and cultural resources, visitor experience and public education;
- report on the results of management actions in respect of resource protection, visitor experience and public education;
- 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 relationships; and
- communicate the state of the mandate elements to stakeholders and the public.

The process for state of the park reporting is relatively new and evolving. Monitoring programs are being developed for each key area of the mandate. Ecological integrity (EI) monitoring is the furthest advanced and new programs are being developed to measure the condition of cultural resources, visitor experience and public education. In 2008, Parks Canada will complete work to establish a long-term suite of indicators and measures. At present, there are a number of information gaps that exist. These gaps will be filled in subsequent reports as monitoring programs develop.

The selection of the current measures and indicators was based on management plan objectives. The findings in the report are important for evaluating the effectiveness of management actions and for identifying deficiencies and adaptive and integrated strategies to be addressed during the review of the management plan.

Achieving the Vision for Kootenay National Park

The Kootenay National Park Management Plan establishes a vision that integrates protection, experience and education in ways that are mutually supportive and interdependent. Figure 1 illustrates how the vision elements achieve Parks Canada's integrated mandate. Without public appreciation and understanding of the value of Kootenay's natural and human history, stewardship and protection of the park's ecological and cultural resources will not occur.

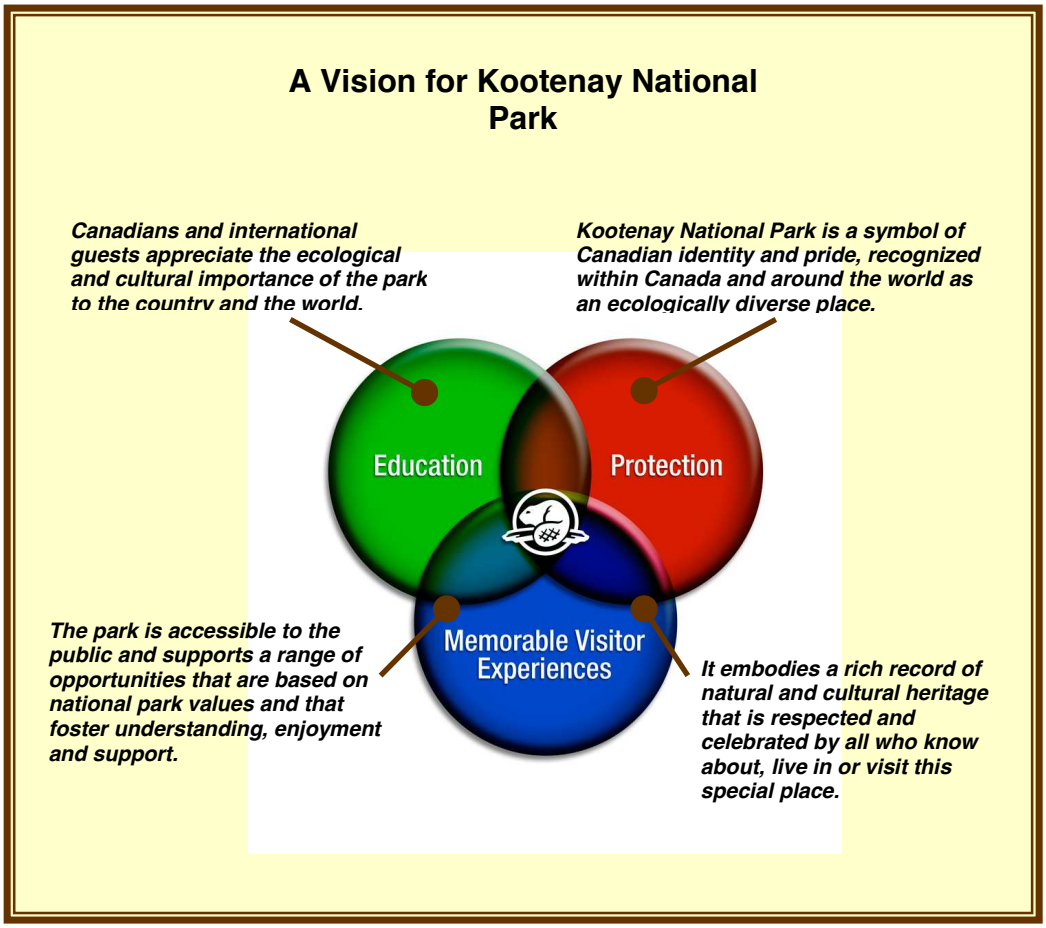
Protection and presentation of Kootenay's natural beauty, functioning ecosystems and heritage values are essential to providing visitors with a memorable park experience.

Strategies to achieve the vision include:

- connecting Canadians to Kootenay National Park though first-hand experiences and learning opportunities;
- managing human use without impairing the integrity of the park's ecological and cultural resources;
- setting limits to growth of outlying commercial facilities;
- restoring terrestrial and aquatic ecosystems;
- protecting and presenting cultural resources;
- collaborating with Aboriginal people on the protection and presentation of Aboriginal heritage in the park;
- developing partnerships to manage shared wildlife populations and promote regional ecosystem health; and
- practicing open management through effective public participation.

The State of the Park Report provides measures of how well the vision for Kootenay National Park is being achieved.

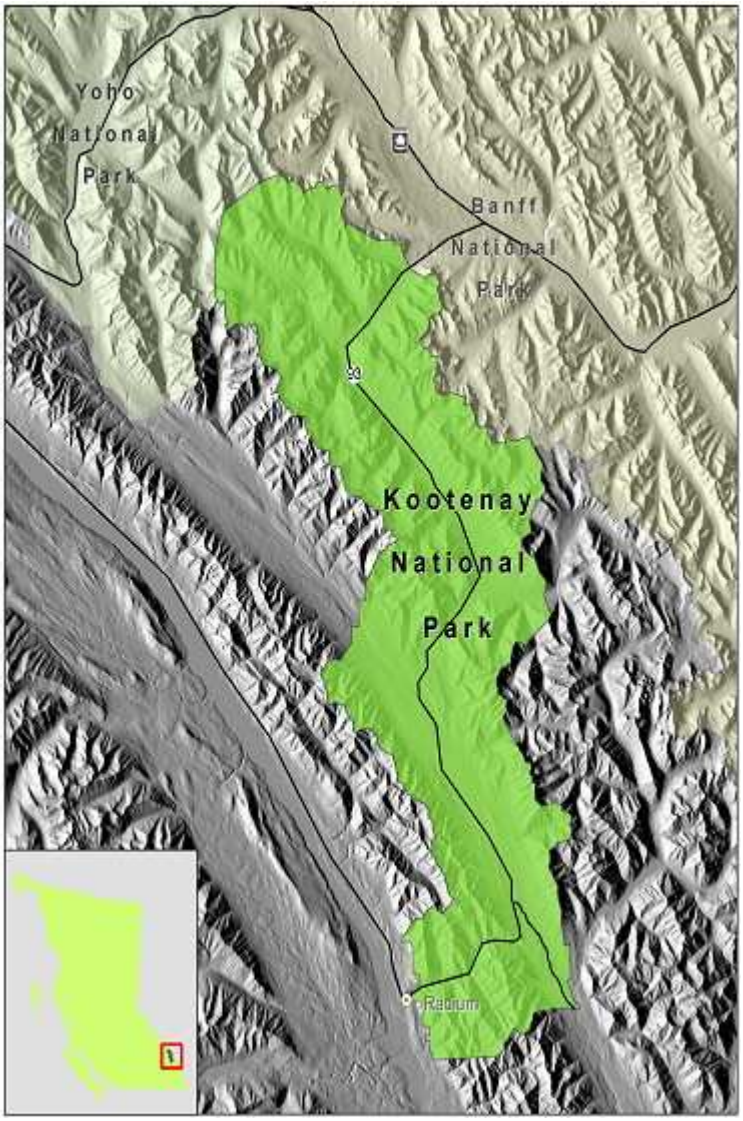
Figure 1: Kootenay National Park's Vision for achieving Parks Canada's integrated mandate



Park Setting

Kootenay National Park was established in 1920 as part of an agreement between the provincial and federal governments to build the Banff-Windermere Highway – the first motor road across the Canadian Rockies. A strip of land eight kilometres wide on each side of the highway was set aside as a national park. The completion of the highway in 1922 expanded the new age of motor tourism in the Canadian Rockies and established a commercial link between the Columbia Valley in British Columbia and Calgary, Alberta.

Covering an area of 1,406 km^2, Kootenay National Park represents the south-western region of the Canadian Rocky Mountains. From glacier-clad peaks along the Continental Divide to semi-arid grasslands of the Rocky Mountain Trench, Kootenay National Park is noted for its diversity of landscapes, ecology and climate. Natural features characteristic of the park include sedimentary rocks and thrust-faulted mountains, landscapes sculptured by glaciers and water, thermal springs and plants and animals typical of alpine, subalpine and montane ecological zones. Approximately 98 % of the park is a declared wilderness area, which provides a greater degree of protection to most of the park.



Together with neighbouring Yoho, Banff and Jasper national parks and three adjacent provincial parks, Kootenay is part of the 20,000 km^2 Canadian Rocky Mountains UNESCO World Heritage Site.

For thousands of years, the area, which is now Kootenay National Park, was part of the traditional lands identified by the Ktunaxa (Kootenay) and Kinbasket (Shuswap) First Nations people. Archaeological evidence suggests the mountains were used primarily as seasonal hunting grounds. Groups also travelled across the mountains periodically to hunt bison on the plains east of the Rockies. Some sites are considered sacred.

Today, approximately 370,000 people per year visit the park. The majority of visitors enjoy the spectacular scenery along Highway 93 South, a 94-kilometre route that passes through the park along the Vermilion and Kootenay rivers and through the narrow gorge of Sinclair Canyon to the village of Radium Hot Springs. Some use the highway simply as a scenic route to reach the Columbia Valley, beyond the park's southern boundary. Many others stop along the way to enjoy picnic areas, viewpoints, interpretive trails, campgrounds and the famous Radium Hot Springs pools.

A significant number of visitors come to the park to hike, both on short day-trips and longer backpacking trips. The popular Rockwall Trail provides a world-class, multi-day wilderness experience through spectacular alpine terrain.

In the summer of 2003, wildfires burned extensive areas in the northern portion of the park. While this natural process is expected to lead to a significant long-term ecological improvement through the restoration of open forest and meadow habitats, it also resulted in significant impacts to many popular visitor facilities. Trails, bridges, campgrounds, day use areas and a backcountry lodge were damaged, destroyed or rendered unsafe by the fires. Post-fire restoration of popular visitor facilities has been a key park management focus in recent years.

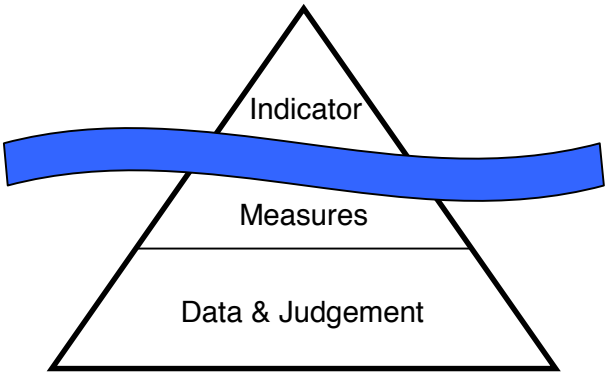
Park ecosystems are subject to pressure from a variety of sources, both within and beyond park boundaries. These include increasing highway traffic and associated wildlife mortality, spread of non-native plants, changes to vegetation communities due to fire suppression and forest pests, and increased resource extraction, road development and recreational use of adjacent provincial lands.

Parks Canada is taking a number of actions to protect the ecological integrity of Kootenay National Park and to provide high quality experiences and learning opportunities. Integrated management that aims to protect the park's heritage resources and provide unparalleled visitor experience is a significant challenge requiring sound ecological and social science research, ongoing public education, and open dialogue with stakeholders. This State of the Park Report represents an important step toward addressing that challenge.

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 providing memorable visitor experiences. Within each of these three broad areas, several indicators have been identified to provide broad representation of key factors influencing the national parks. Each indicator is supported by several measures, which are based on data gathered through a variety of sources. When data are insufficient, professional judgment based on evidence is used to assess conditions. Discussion in this report focuses on the condition of indicators, rather than the considerable background material (measures, data and professional judgment) used to inform the indicators. This approach is depicted in the 'iceberg model' shown in Figure 2.

Figure 2. The 'iceberg model' of indicators and measures



At the time of preparation of this State of the Park Report, the monitoring program is still in development. Some indicators and measures are based on existing long-term monitoring programs and can be readily assessed and reported on now. Other indicators and measures are more recently established and monitoring programs provide limited data on which to base evaluations and ratings. In some cases monitoring has not yet begun and information gaps exist.

Data sources include programs undertaken by Parks Canada and external agencies. In some cases where limited data are available, the professional judgment of Parks Canada staff 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 Kootenay National Park, this report will provide a baseline for the new monitoring program against which future state of the park reports can be compared.

The indicators of resource protection, visitor experience and public education are rated for their condition and trend. The condition and trend ratings are *italicized* throughout the document to emphasize the use of these concepts. For clarity, symbols and colours are used to represent the condition and trend of the indicators and measures, as shown in Table 1.

Table 1. Symbols used for indicator evaluation

Condition		**Trend**	
Good: the condition of the indicator/measure is satisfactory.	●	*Improving*: the condition of the indicator/measure is improving.	↑
Fair: there is concern regarding the state of this indicator/measure.	▼	*Stable*: the condition of the indicator/measure is not changing.	↔
Poor: the condition of the indicator/measure is poor or low.	■	*Declining*: the condition of the indicator/measure is declining.	↓
Not rated: there is insufficient information to determine condition.	◆	*Not rated*: there is insufficient information to determine trend.	N/R

2.1 Resource Protection Indicators

Measures are rated by comparing the actual state of the measure with its desired state, or target. For some measures, targets are established in the existing Park Management Plan. In other cases, targets established by agencies other than Parks Canada can be used. Where adequate information is not yet available to set a specific target, the professional judgment of Parks Canada staff, based on evidence and validated through expert consultation, is used to determine the rating. Some indicators and measures cannot be rated due to lack of information.

A similar approach is used to assess and rate indicators related to cultural resource management. Due to data limitations, including lack of recent inventories and evaluation, trends cannot be reported for cultural resource indicators at this time.

Measure ratings are combined to provide indicator ratings by using a simple majority. For example, if three of five measures are rated in good condition (green), the indicator is assigned a rating of "good". In cases where there is no majority among measure ratings, the indicator is rated as *fair* to reflect uncertainty as well as concern.

A distinction is necessary between the trend rating assigned to an ecological indicator or measure and the characteristics of the measure. For example, a wildlife population may increase or decrease, but the trend rating and associated arrow symbol refer to whether ecological integrity is *improving* or *declining*, not to the size of the population.

2.2 Visitor Experience and Public Education Indicators

The indicators used to assess visitor experience and public education are relatively new in the Parks Canada monitoring program. Few specific measures and monitoring programs are in place. As a result, ratings for these indicators are mostly based on an analysis of existing survey data, primarily from a 2003 park-wide visitor survey, supplemented by site specific survey information and the professional opinion of Parks Canada staff, based on evidence and validated through expert consultation. Parks Canada has targets for visitor satisfaction, but targets for other indicators have not yet been established. The visitor experience and public education indicators are rated based on the judgment of Parks Canada staff in Kootenay National Park.

3.0 Assessment of the State of Heritage Resources, Visitor Experience and Public Education

3.1 Condition of Information Base

Information used to evaluate and rate the condition of the measures and indicators in this State of the Park 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 rigor. There are, consequently, 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 experts to determine the applicability of the data. External experts were also consulted where appropriate. Where there were significant gaps in available data, the professional judgment of Parks Canada specialists and managers was used to inform 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 relatively large quantities of data derived from established long-term research or monitoring programs intentionally designed to evaluate the condition of a measure at the broad park level. 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 Park 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. As a result, while some measures are based on high quality, statistically powerful data from established, long-term programs, the majority of the information base falls into the second category described above.

While differences in data quantity and quality occur between individual measures and indicators throughout the information base, some general trends among broader categories are apparent. The quality and quantity of data available to evaluate and rate measures and indicators under the ecological integrity heading are generally higher than for the other categories. Existing inventories and evaluations of cultural resources provide a generally stronger basis for condition ratings than is available for visitor experience and public education measures and indicators.

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 to apply to future State of the Park reporting and to inform park management decisions.

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

3.2 Heritage Resource Protection

3.2.1 Ecological Integrity

Under the *Canada National Parks Act*, the maintenance or restoration of ecological integrity is the first priority in all aspects of park management. Ecological integrity means, with respect to a park, a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and 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 (e.g. fire, succession, 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
- Landscapes and Geology
- 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 (e.g. regional badger population). An assessment of condition and trend is assigned to the indicator where possible, based on quantitative and qualitative data analysis and professional judgement.

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.

Indicator: Native Biodiversity

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.

Biological diversity occurs at several different scales: genetic, species, community, and landscape. Each requires special attention to ensure its continuing viability.

The species level of biological diversity is well represented by the measures selected for this indicator (see Table 2). Most of the monitoring to date in Kootenay National Park has concentrated on species at risk, with a view to maintaining or restoring viable populations. Although there are no measures related to the diversity of biological communities at this time, the species at risk measures are likely reasonable surrogates.

Protection of species at risk often goes hand in hand with habitat maintenance or restoration that benefits a whole suite of species. For example, bighorn sheep are dependent on low elevation open forest and grassland habitat. This type of habitat was once commonplace in the Columbia trench, but has dwindled over the years. Bighorn sheep could be considered an indicator species for this type of community. Habitat restoration near the village of Radium Hot Springs aimed at improving bighorn sheep winter range will create suitable conditions for a variety of provincially and federally listed species, including badger.

Table 2. Condition and trend of native biodiversity measures

Measure	Condition/ Trend	Measure	Condition/ Trend
1. Bighorn Sheep Population	↔	5. Badger Population	↔
2. Mountain Goat Population	↔	6. Highway Mortality	↓
3. Grizzly Bear Mortality	↓	7. Native Fish Populations	↓
4. Grizzly Bear Habitat Security	↔		

The rating for many of the measures is based on population estimates and trends. Populations vary from year to year. Defining an acceptable range of variation is simpler for some species than

for others. Species that congregate in specific areas, such as bighorn sheep, are easier to count than wide-ranging species like grizzly bear and badger. Where park-specific data are limited, as with mountain goats, regional analyses have helped to provide a more complete picture.

For wide-ranging species, it could be misleading to look at only the park population, since individuals occupy ranges that cross park boundaries. The grizzly bear analysis includes data for Banff and Yoho national parks, since the populations in these three parks are interconnected. The ratings presented here for measures related to grizzly bears reflect the conditions for Banff, Kootenay and Yoho combined, although conditions within Kootenay National Park are likely more positive due to lower mortality and improvements to habitat quality from recent fires. Badgers use habitat in Kootenay National Park on an infrequent basis. Parks Canada has been participating in provincial efforts to recover the regional population in the East Kootenays, in part by restoring open grassland habitat suitable for badgers.

The Kootenay National Park Management Plan identifies several stressors that are affecting wildlife populations. Most large mammals in Kootenay National Park are limited by a lack of secure montane habitat. Although much of the park consists of rock and ice, large patches of high quality habitat at lower elevations support carnivores, ungulates, and other species. Human caused mortality (especially highway-related mortality), disturbance, habitat loss and habitat fragmentation in the ecosystem influence how successfully large mammals can use this habitat. Park populations are also affected by conditions in the surrounding landscapes, where stressors such as increasing human population and development contribute to cumulative effects on ecological integrity.

The introduction of non-native species into the park has also affected native biodiversity. Non-native species can out-compete native species or, less commonly, they may hybridize with native species. Over time, the result is reduced abundance and distribution of native species. For example, non-native fish are widespread in the southern end of the park. Although fish populations have not been sampled systematically since the early eighties, recent work suggests that westslope cutthroat trout, a species of special concern in British Columbia, is being threatened by hybridization with rainbow trout. The number of pure westslope cutthroat trout is declining.

Overall, this indicator is rated as *fair* and the trend is towards *stable* ecological integrity. This evaluation indicates that concern is warranted and that park-level and regional stressors need to be addressed. Most measures, including those rated as *poor,* are affected strongly by regional pressures over which Kootenay National Park has limited influence.

Parks Canada and neighbouring jurisdictions are trying to maintain or restore some components of park and regional ecosystems, particularly rare or sensitive carnivores like grizzly bears and badgers. In general, ungulates appear to be faring slightly better than carnivores. More work is needed to address park-level and regional stressors. Two measures discussed below, bighorn sheep and highway mortality, give an indication of the progress Parks Canada is making in addressing these threats.

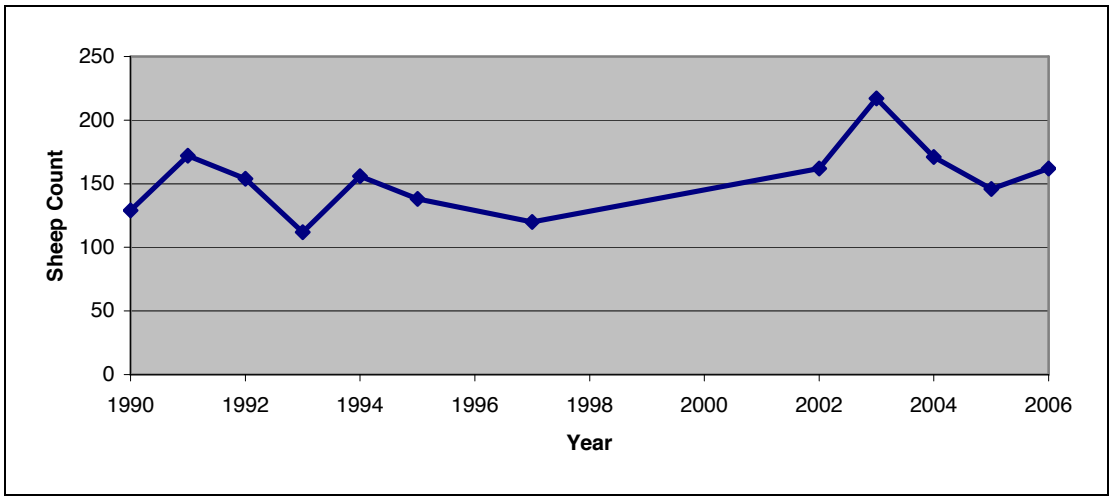
Bighorn Sheep Population

Bighorn sheep are blue-listed in the province of British Columbia, which means that they have characteristics that make them particularly sensitive to human activity or natural events. The Radium Hot Springs herd, which winters in the Radium area and summers in the park, is locally and regionally important. Sheep from the Radium herd have been transplanted to help recover other herds in southeastern British Columbia.

Winter range in the Radium area can comfortably support between 120 and 200 sheep. The population has generally remained within these bounds since 1990, and has been assigned a *stable* trend, however recent counts indicate that it has fallen to the lower-middle end of this range (Figure 3).

Sheep habitat has been reduced from historic levels by human development and forest encroachment. Parks Canada and its partners have been working cooperatively to restore winter range in the Redstreak area. The Radium herd has responded positively to this work, and monitoring is ongoing. For these reasons, the ecological integrity of the herd has been rated as *good*.

Figure 3. Bighorn sheep population size: Radium Hot Springs herd (1990-2006)



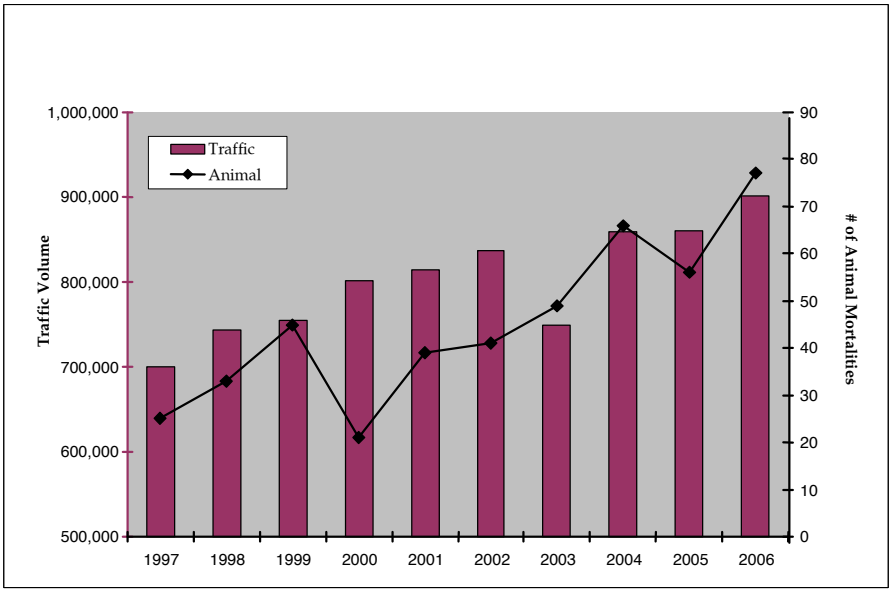
Despite this progress, other stressors could result in population decline. Highway mortality levels are high, approaching or exceeding 10 % of the population annually. Several domestic sheep operations are located near wild sheep range. In the absence of mitigating measures (e.g. fencing), there is the potential for disease outbreaks to spread from domestic sheep to wild sheep. In combination with likely future natural events, such as an unusually harsh winter, these concerns present considerable risk to the population.

Highway Mortality

At least 452 mammals, ranging in size from bobcat to moose, have been killed on the Kootenay Parkway in the last 10 years. While most park populations are likely stable or slightly decreasing, the total number of animals killed on the highway every year is increasing. Traffic volumes on the Kootenay Parkway are also increasing and few measures are in place to protect wildlife (see

Figure 4). Highway mortality may keep populations artificially low and make population recovery for species at risk more difficult. Given these factors, this indicator has been rated as *poor* and *declining*.

Figure 4. Known Wildlife Mortalities and Traffic Volumes on the Kootenay Parkway (1997-2006)



Highway mortality is also a concern at the regional scale. Mortalities in adjacent parks and on regional roadways can affect species that have home ranges that span several jurisdictions. Human-caused mortality of female grizzly bears in Banff, Kootenay and Yoho National Parks has exceeded the proposed 1.2 % target for the past six years, compromising the population's reproductive capacity. Badger mortality on regional roads has also increased over the last five years, and is a cause for concern.

Indicator: Terrestrial Ecosystems

The terrestrial ecosystem indicator looks at how land-based ecosystems within the park, in particular vegetation resources, are being shaped by both natural disturbances and human activities. Monitoring to date has focused largely on forest insects and disease and non-native plants.

The ecological integrity of this indicator is considered to be *fair* with a *declining* trend (see Table 3). Vegetation communities and ecological processes are still intact. However, without active management, many of these processes play only a fraction of their historic role, and vegetation communities are affected. Past management practices, such as wildfire suppression, have caused the park's vegetation to change over time. In turn, these changes contribute to increased susceptibility to both native and non-native forest insects and disease.

Table 3. Condition and trend of terrestrial ecosystems

Measure	Condition/Trend
1. Disturbance by Forest Insects and Disease	↔
2. Exotic Pathogens	↓
3. Non-native Plants	↓

Parks Canada is making progress in some important areas, such as the restoration of fire (see the Landscapes and Geology section), and this is expected to result in long-term positive effects on vegetation community structure and function. There has been less progress in other areas, such as management of forest insects and disease and invasive plant species

Human activities are altering park vegetation on a large scale. For example, whitebark pine, a common tree in subalpine forests in the Canadian Rockies, has been affected negatively in much of its range by an introduced disease known as blister rust. A lack of fire, which promotes germination of new seedlings and eliminates competing species, and mountain pine beetle are also affecting whitebark pine. The incidence of blister rust infection and tree mortality appears to be slightly worse west of the Continental Divide and is unlikely to improve without active intervention. As a result, the exotic pathogens measure has been rated as *poor* with a *declining* trend. Continued decline could jeopardize the survival of this species.

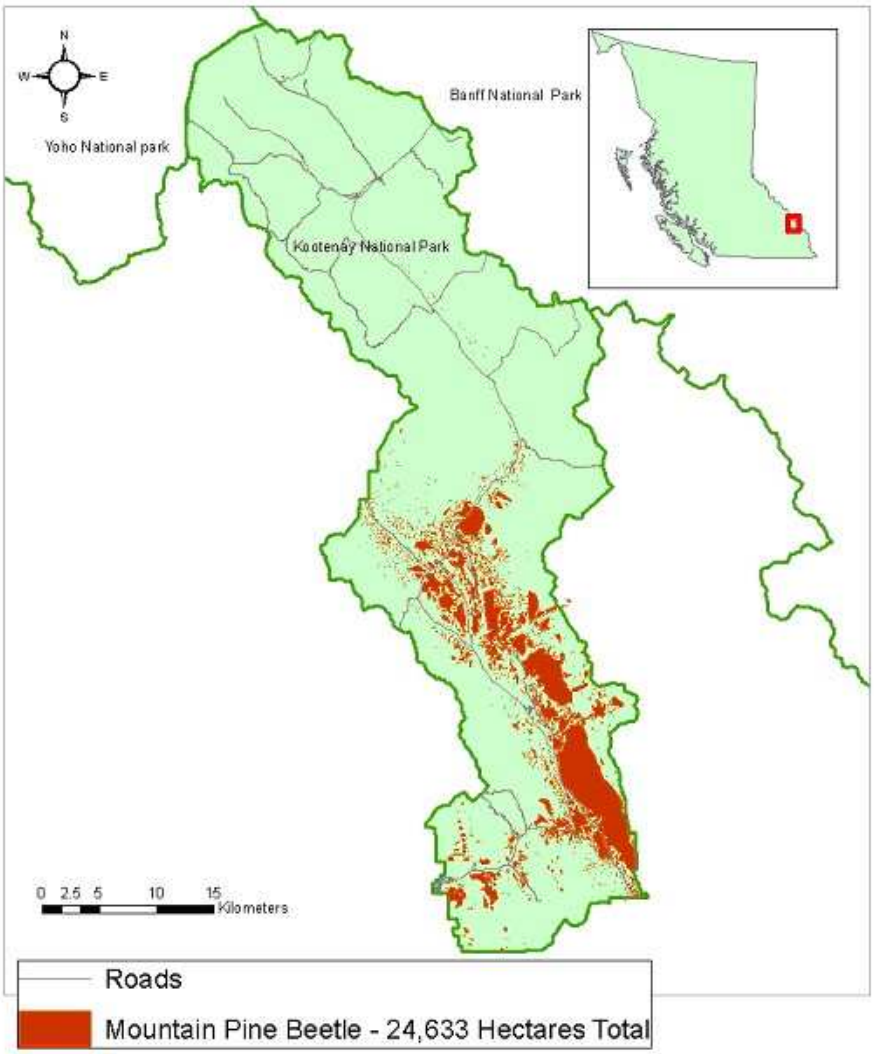
Disturbance of native vegetation for roads, buildings, and other visitor facilities, as well as through natural and prescribed fire and forest thinning projects, increases the potential for the establishment and spread of non-native plant species. The extent of non-native vegetation, such as knapweed, has been gradually increasing in the park, although the overall area is still relatively small. This measure is considered to be *fair* with a trend toward *declining* ecological integrity.

Disturbance by Forest Insects and Disease

The absence of fire and a changing climate have altered conditions for forest insects and disease in Kootenay National Park, which in turn leads to changes in the park's vegetation. For example, mountain pine beetle, a native bark beetle, is affecting lodgepole pine stands at a scale likely not seen historically. Uncertainty around the long-term effects of the current level of infestation on forest structure and biodiversity has prompted a condition rating of *fair*.

The total area of mature lodgepole pine affected by pine beetle has been growing since the early eighties. The infestation expanded rapidly in the mid-nineties and appears to have peaked in recent years (see Figure 5). The wildfires in 2003 have limited the amount of lodgepole pine available to mountain pine beetle in the Vermilion Valley. The mountain pine beetle has already attacked the bulk of the mature pine in the Kootenay Valley. With little room to grow, the mountain pine beetle population has been assigned a *stable* trend. As a more representative mix of stands is created over time through prescribed burning and wildfire, forest insect populations should return to historic levels.

Figure 5. Mountain pine beetle infestation of Kootenay National Park from 1980-2006



Indicator: Aquatic Ecosystems

Kootenay National Park contains a diversity of aquatic ecosystems, including wetlands, thermal springs, lakes, rivers and streams. Rainwater and meltwater from snow and glaciers replenish the surface waters flowing through these systems directly or through groundwater. This indicator provides information about the physical environment in which aquatic organisms live and about how that environment is changing in response to external pressures. The assessment is based mainly on monitoring of rivers, which serves as a good proxy for other aquatic habitats. Overall, the condition of this indicator is rated as *good* with a *stable* trend. More work is needed to track emerging issues (e.g. airborne pollutants, climate change) and tackle existing problems (e.g. culvert improvements). The condition and trend of the measures that comprise this indicator are shown in Table 4.

Table 4. Condition and Trend of Aquatic Ecosystems.

Measure	Condition/Trend
1. Water Quality	↔
2. Water Quantity	↔
3. Aquatic Connectivity	↓

Surface water quality and quantity are arguably the most important factors affecting the health of aquatic ecosystems. A key objective of the management plan is to maintain water quality, water levels and flow regimes within the natural range of variability. The depth and velocity of water in a stream or river determines how much habitat is available to aquatic organisms and controls other variables, like temperature and turbidity. Sustained periods of low flows can alter aquatic community structure, for example, by causing the water temperature to rise above the level that can be tolerated by native fish. Generally, water quality and quantity do reflect the expected range of variability and thus the condition and trend of these measures is *good* and *stable*. Some weak trends have been observed in the flows of the Kootenay River that may be related to climate change and may indicate a shift in the hydrological regime.

The aquatic connectivity measure provides a snapshot of how park management practices, such as culvert installation, have altered the aquatic environment. The aquatic connectivity measure is rated as *fair* with a *declining* trend. Eighty-five percent of culverts in Kootenay National Park are hindering or blocking fish movement. Aging culverts, some of which no longer perform as intended, contribute to the declining trend of this measure. Downstream damming and resource extraction activities (e.g. timber harvesting in the Upper Kootenay watershed) may also have affected aquatic ecosystems in the park.

Additional detail about one representative measure of this indicator, water quality, is provided below.

Water Quality

Environment Canada maintains two water quality monitoring stations in Kootenay National Park, in partnership with Parks Canada. Established in 1987, the station on the Kootenay River, monitors long-term trends in water quality. A new station was installed on the Vermilion River in 2003 to track potential changes in water quality following that summer's large wildfires.

Water quality is assessed using the Canadian Water Quality Index (CWQI). Key water quality variables, such as turbidity, temperature and major ions make up this index. Each is measured, and the results compared to established guidelines for the protection of aquatic life. Five rankings are possible: excellent, good, fair, marginal and poor.

Water quality at both the Kootenay and Vermilion stations was rated as *good*. Trace metals (e.g. cadmium, copper, iron and lead) occasionally exceed the guidelines, particularly in the Vermilion River, however these elevated levels are likely natural. The wildfires in 2003 have likely mobilized trace metals, which are then transported into park waters. Since the metals are bound to the suspended sediment in water, they are unavailable to aquatic life, and therefore pose little risk. The Vermilion River also has moderately higher levels of some ions and nutrients, such as

chloride, nitrate and total phosphorus, than the Kootenay River. Again, this is probably due to the wildfires, which typically cause nutrients to be released from the soil.

Both the Kootenay River and Vermilion River are important reference sites for tracking the impacts of climate change on Kootenay National Park. Although it is too soon to identify any trends from the Vermilion River site established in 2003, some weak trends have been identified in the Kootenay River that may be related to climate change: increased turbidity, nitrate, total dissolved nitrogen and chloride. Increased chloride may also be related to salt management practices along the Kootenay Parkway. Overall, the trend of water quality is rated as *stable*, however more monitoring is required to understand the weak trends that have been identified.

One emerging issue that may affect water quality in the future is the deposition of long-range airborne pollutants in park waters. A model is currently being developed for the mountain parks that will help to predict where contaminants carried by rain and snow are being deposited.

Indicator: Regional Landscapes

This indicator addresses issues affecting park ecosystems at the landscape level, including some that extend beyond park boundaries. Landscape diversity includes all the ecosystems in an area, plant and animal communities, and the physical habitat. Some level of landscape diversity is desirable (e.g. the mosaic of vegetation of different ages created by periodic wildfires), however too much diversity can be detrimental to habitat suitability for individual species, and can reduce connectivity between habitats. Overall, this indicator is considered to be in *fair* condition with a *stable* trend (see Table 5).

Table 5. Condition and Trend of Landscapes and Geology.

Measure	Condition/Trend
1. Disturbance by Fire	↑
2. Regional Cutblocks	↔
3. Regional Human Populations	↓

Habitat fragmentation, particularly in areas adjacent to park boundaries, is known to affect wide-ranging wildlife. Substantial areas of forest adjacent to Kootenay National Park are used for commercial harvesting and related road development that fragment habitats and provide

increased access to otherwise remote areas of the park. Cutblock and related road development in the Beaverfoot Valley adjacent to the park has more than doubled over the past 30 years, although the rate of activity has slowed in more recent years. As a result of cooperation with provincial authorities, ecological impacts have been mitigated to some extent through avoidance of sensitive areas and limitation of motorized access to some harvested areas.

Human population in most areas surrounding the mountain national parks and Kootenay National Park in particular has grown considerably in recent years. Between 2001 and 2006 the populations of Calgary, Invermere and Radium Hot Springs increased by 13 %, 5 % and 26 % respectively. This measure provides some indication of increased ecological pressure through associated traffic increases in the park and various development-related activities on lands adjacent to the park.

Little monitoring is carried out currently at the landscape scale. One landscape level disturbance that is well understood in Kootenay National Park is wildfire.

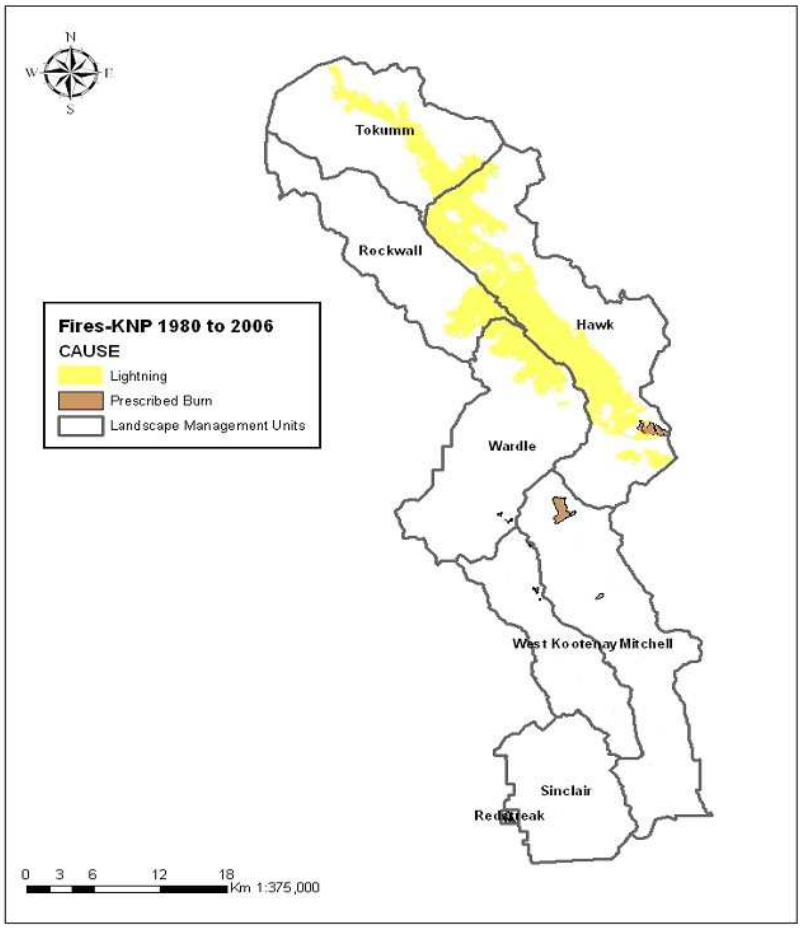
Disturbance by Fire

The vegetation in the Rocky Mountains adapted to natural disturbances (e.g. wildfire, avalanches) over thousands of years. Many plant species need some level of disturbance to regenerate. For example, lodgepole pine needs fire to open its cones and prepare the soil for germination. Disturbance initiates and terminates major successional change and creates a mosaic of vegetation at the landscape level. The abundance and arrangement of suitable habitat is an important determinant of biodiversity. The policy of wildfire suppression that was in place for decades has led to a gradual aging of forests and a loss of important early successional forest habitat. Parks Canada is seeking to reverse this trend by restoring natural fire disturbance processes in the park.

The "disturbance by fire" measure focuses on Parks Canada's progress in restoring or maintaining ecological processes on the landscape. Wildfire is a disturbance that has been well studied in Kootenay National Park. The management plan contains a target to restore 50 % of the long-term fire cycle. This target has been exceeded in recent years, due to natural events (e.g. the wildfires of 2003) and an ambitious prescribed burning program.

Most of the fires to date have occurred in the subalpine ecoregion of the north end of the park (see Figure 6). Little area has been burned in the Kootenay Valley and Radium area; areas that once had active fire regimes. Prescribed burning has been helping to achieve targets for these areas, however more burning is required. For this reason, this measure has been assigned a *fair* condition rating. The trend is towards *improving* ecological integrity, since the fire management program is moving steadily towards the target for area burned.

Figure 6. Fires by Landscape Management Unit of Kootenay National Park



Indicator: Climate and Atmosphere

Climate plays a fundamental role in shaping ecosystems. Distributions of plant and animal species, rates of glacial advance and retreat, patterns of river flows, and the frequency and magnitude of natural disturbances are all influenced strongly by climatic variables such as temperature, precipitation and snow depth.

Climate varies from year to year and decade to decade as a result of natural cycles. However, there is international consensus that the global climate is warming at an unprecedented rate, and that this warming is largely attributable to greenhouse gases released by human activity. Park weather data indicate that local climate conditions are following this global trend. If this trend continues, there will be implications for both ecological conditions and visitor experiences in the park. Vegetation and animal distribution patterns may change. New species, including undesirable pathogens, may become established in the park. Summer visitation seasons may lengthen. Winter recreational activities may be affected by changing snow depth. Iconic views of glaciers and other park ecosystems may change dramatically. Storm patterns and fire cycles may

shift. Climate can affect all aspects of the Parks Canada mandate, and adaptation and mitigation strategies will be required as changes occur.

Parks Canada and others have collected significant data related to climate and atmospheric conditions in the park. Relevant data for key measures are outlined below. Although these data indicate some clear and important trends, there has not been specific research conducted into the effects of changing climatic conditions on the park. The measures are assigned a declining trend in relation to their potential effect on ecological integrity. Parks Canada has not yet determined targets, thresholds or reference conditions and a condition rating for this indicator is not assigned.

Table 6. Condition and Tend of Climate and Atmosphere.

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

Parks Canada operates a network of weather stations, often in collaboration with the Meteorological Service of Canada (Environment Canada) or as Park Fire Information Stations. The Environment Canada weather station at the West Gate (near the town of Radium Hot Springs) is the only station in Kootenay National Park that has a long enough dataset for analysis. These data show that mean annual temperature has increased since 1955, at a rate of + 5.3°C per century at this location. This trend is consistent across spring, summer, winter and fall.

Precipitation trends are more difficult to detect because precipitation patterns can vary greatly within a region. The data showed a general decline in precipitation over the last 50 years in the Radium area, however only the change in total precipitation in winter (-14% per decade) was statistically significant. Results show that the snowpack at three snow courses in Kootenay National Park has decreased over the last 50 years. Fay Glacier has also receded on the order of 35% since 1975. These results are in general agreement with other regional studies.

Parks Canada will continue to monitor climate and ecosystem variables that may lead to a better understanding of potential environmental effects related to global climate change.

Emerging Issues and Key Planning Considerations for Ecological Integrity

Based on the evaluations and ratings provided in the preceding section, the following key ecological issues have been identified that may warrant additional consideration as part of future park management planning.

- Regional populations of rare or sensitive wildlife species, e.g. grizzly bear, badger and bighorn sheep, face challenges due to habitat change and non-natural sources of mortality.
- Highway-related mortality is a significant concern for many wildlife species. Wildlife mortality appears to be increasing as a result of increasing traffic on Highway 93 South.
- Considerable progress has been made toward re-establishing fire as a key process influencing vegetation communities, but concerns remain regarding non-native plant species, pathogens and insects.
- Ecological concerns associated with regional development, population growth and traffic levels are increasing. These issues are particularly challenging for Parks Canada, which has limited ability to influence these factors.
- While the specific, local ecological impacts of climate change are uncertain, emerging climate trends indicate that increased concern and consideration of the potential influences of climate on park management decisions is warranted.
- Existing research and monitoring programs need to be refined to provide a more comprehensive evaluation of ecological conditions, to more accurately measure the results of management actions and to better inform management decisions.

3.2.2 Cultural Resource Management and Palaeontological Sites

Parks Canada defines a cultural resource as a resource that has historic value. It can be a human work, a place that gives evidence of human activity, or an object or place having spiritual or cultural meaning.[2] Cultural resources include cultural landscapes, archaeological resources, historic objects, federal heritage buildings, and other buildings and structures. In national parks, cultural resources often reflect the human interaction with the natural environment over time. Giving equal consideration to the protection of cultural resources and their natural surroundings, while still providing for meaningful visitor appreciation of these resources, adds to the management challenge.

Cultural resources consist of National Historic Sites (Level I resources) and other resources (Level II resources) that are not of national significance but still have historic value. While there are no Level I resources within Kootenay National Park, Parks Canada administers the nearby Kootenae House National Historic Site, as well as a number of other National Historic Sites throughout the mountain national parks. Since National Historic Sites have individual management plans to provide a framework for management and evaluation, only Level II cultural resources are considered in this State of the Park Report.

The Level II cultural resources in Kootenay National Park of Canada were evaluated using the indicators of Resource Condition and Selected Management Practices. An assessment of condition is assigned to the indicator where possible, based on quantitative and qualitative data

[2] Parks Canada Guiding Principles and Operational Policies; Cultural Resource Management Policy.

from several different sources, including the Asset Management System (AMS), Archaeological Resource Description Analysis (ARDA), Artifact Information System (AIS), and Built Heritage Resource Description Analysis (BHRDA), as well as specialist opinion and traditional knowledge. Due to data limitations, including lack of recent inventories and evaluation, trends will not be reported.

Resource condition was rated as *fair*, however the condition of many resources was difficult to rate due to a lack of recent information. Substantial work is required to improve the management practices that ensure that cultural resources are properly evaluated and protected; this measure received a rating of *poor*. A significant factor influencing these condition ratings is that Parks Canada's recent cultural resource management priorities have focused on improving the protection and presentation of National Historic Sites, which are not included in this evaluation.

Indicator: Resource Condition

A diverse cultural heritage spanning thousands of years has left its mark on Kootenay National Park of Canada. The park encompasses 97 archaeological sites, over 2,700 archaeological artifacts, four heritage buildings, and other significant cultural features, including the Paint Pots and Radium Hot Springs.

Resource condition is assigned a rating of *fair*. Although some resources are in good condition, and a small number are in poor condition, the bulk of resources are in fair condition (there has been minor loss, damage or deterioration, resulting in minor or potential loss of integrity). In many cases, it was difficult to assess the condition of resources, because inventories were outdated or non-existent. In many cases, expert opinion was used to determine the final rating for each measure. Measures informing the condition of this indicator are shown in Table 8.

Table 8. Resource condition measures.

Measure	Condition	Measure	Condition
1. Landscapes and Landscape Features	●	4. Buildings and Structures	■
2. Archaeological Sites	▼	5. Burgess Shale	▼
3. Objects	▼		

Little formal monitoring or conservation of cultural resources takes place. However, general staff awareness and diligence regarding local cultural resources has provided a basic level of protection. Cultural resources in Kootenay National Park could benefit from additional attention in order to ensure that resources do not deteriorate to the point where they lose their integrity.

Palaeontological resources of the Burgess Shale are considered under this indicator, as management issues and approaches are similar to those for cultural resources. Burgess Shale outcrops within Kootenay National Park are considered to be in *fair* condition. While exposed fossils are subject to natural weathering and potential illegal removal from the park, these

concerns are somewhat mitigated by the generally remote locations of the resources combined with improved inventories and protective measures.

Indicator: Selected Management Practices

The management of Level II resources within Kootenay National Park has been a secondary priority for Parks Canada, as the recent focus has been improving the protection and management of National Historic Sites. A Cultural Resource Management Plan for Kootenay National Park was drafted in 1998, however the plan requires updating and formal approval in order to provide better strategic direction for the management of Level II resources. A recent positive development is the formation of a Cultural Resource Management Advisory Board to prioritize and administer cultural resource management expenditures within the seven mountain national parks. Measures informing the condition of this indicator are shown in Table 10.

Table 10. Condition of selected management practices

Measure	Condition
1. Inventory and Evaluation	
2. Cultural Resource Management Strategy	

Selected Management Practices are assessed to be in *poor* condition. Inventories do not provide an adequate picture of the cultural resources that exist in the park, and monitoring and conservation activities are not regularly scheduled. A revised Cultural Resource Management Plan would provide improved management direction and formalize evaluation criteria. The absence of these tools makes it difficult to identify and protect resources under threat.

Emerging Issues and Key Planning Considerations for Cultural Resources and Palaeontological Sites

Based on the evaluations and ratings provided in the preceding section, the following key cultural resource management issues have been identified that may warrant additional consideration as part of future park management planning.

- The management of Level II cultural resources in Kootenay National Park is challenging due to the number of resources and the need to manage National Historic Sites (Level I resources) in other parts of the Lake Louise, Yoho and Kootenay Field Unit as a priority.
- The park does not have an up-to-date Cultural Resource Management Plan. A revised plan would help set conservation and protection priorities to better guide decisions related to cultural resource management.

- Inventories and assessments of cultural resources, including archaeological and built heritage resources, are incomplete and out-of-date. Cultural resources would benefit from monitoring on an ongoing basis to determine if conservation measures are warranted.
- Positive steps have been made on consultation and collaboration with aboriginal peoples, providing a good foundation for continued progress.
- A communications plan providing a strategy and objectives for cultural resource messages is lacking. Formal monitoring and evaluation is required to determine if message delivery is effective and if audiences understand the messages.
- Positive trends toward protection and management of palaeontological resources could be continued through completion of a Burgess Shale management plan.
- A number of projects are underway nationally that will help address some of these cultural resource management challenges. A national Cultural Resource Information System (CRIS) is being developed that will provide a "one-window approach" to cultural resource information and databases, and facilitate better monitoring and evaluation of Parks Canada's cultural resources.

3.3 Visitor Experience

Parks Canada places great emphasis on providing opportunities for meaningful visitor experiences. These opportunities will enable visitors to develop a clear and strong connection to the nature and history of the national park as well as contributing to personal well-being and health. Through the provision of a variety of visitor services, facilities and programs by Parks Canada and others, Canadians have been able to enjoy and appreciate Kootenay National Park for almost 90 years

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. In most cases the evaluation of indicator condition and trend is based on professional judgment. 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 Park Report represents the first opportunity to view visitor experience in Kootenay National Park in terms of these indicators. Except for visitor satisfaction, no targets are available for these indicators. 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. This indicator examines our understanding of those for whom we are providing opportunities: their characteristics, visitation trends and how and whether these visitors can be segmented to better target opportunities for memorable experiences.

Overall, this indicator is rated as *fair* with an *improving* trend. Since 2000 visitor information collected by Parks Canada has improved the agency's understanding of visitors and their needs. Areas where better information could be collected include backcountry visitor statistics, more detailed market segmentation information and better understanding of visitors that primarily drive through the park.

Visitors to Kootenay National Park vary in their expectations, motivations and the activities they undertake. Broadly, four types of visitor exist:

- *Premium Experience (30 % of park visitors)*: Many of these are first time visits to the park, but members of these trips tend to seek out park information either before or during the visit. The trips involve higher levels of spending, and trip satisfaction is generally high.
- *Habitual/Familiar (30 % of park visitors)*: These trips are usually preceded by previous (three or more) visits within the past two years. Most visits are with Canadians and because they have past experience with the park(s), they don't often seek additional sources of information. Trip spending is generally light to moderate, and as the segment name implies, satisfaction is high.
- *Casual Experience (40 % of park visitors)*: This segment of visits could also be termed "middle of the road". In contrast to the above types of trips, they don't stand out on any particular aspect. Many of these are repeat visits, and satisfaction with the park tends to be quite high.
- *Flow-through visitors:* This fourth visitor type is apparent from surveys and observation. Although this segment may include a substantial number of travelers driving through the park, data are insufficient to draw many conclusions about this group, due to survey limitations.

Driving and sightseeing, visiting the hotpools and hiking are undertaken by the first three groups, but to different extents. The *Premium Experience* visitor is characterized by driving and sightseeing and is less likely to visit the hot pools than the other two: one quarter of this group listed the hot pools as an activity compared to one third for the other two groups. *Habitual* visitors are greater users of the hot pools compared to *Casual Experience* visitors, but the latter undertake more hiking. Table 11 shows the activities engaged in by these segments.

Visitation to Kootenay has been relatively constant since 2000. In 2003, there were approximately 371,000 independent (i.e. group tours not included) visitors to the park, the origin of which was:

- Alberta: 23 %
- other Canadian provinces: 28 %
- United States: 31 %
- other countries: 18 % (including 14 % from Europe).

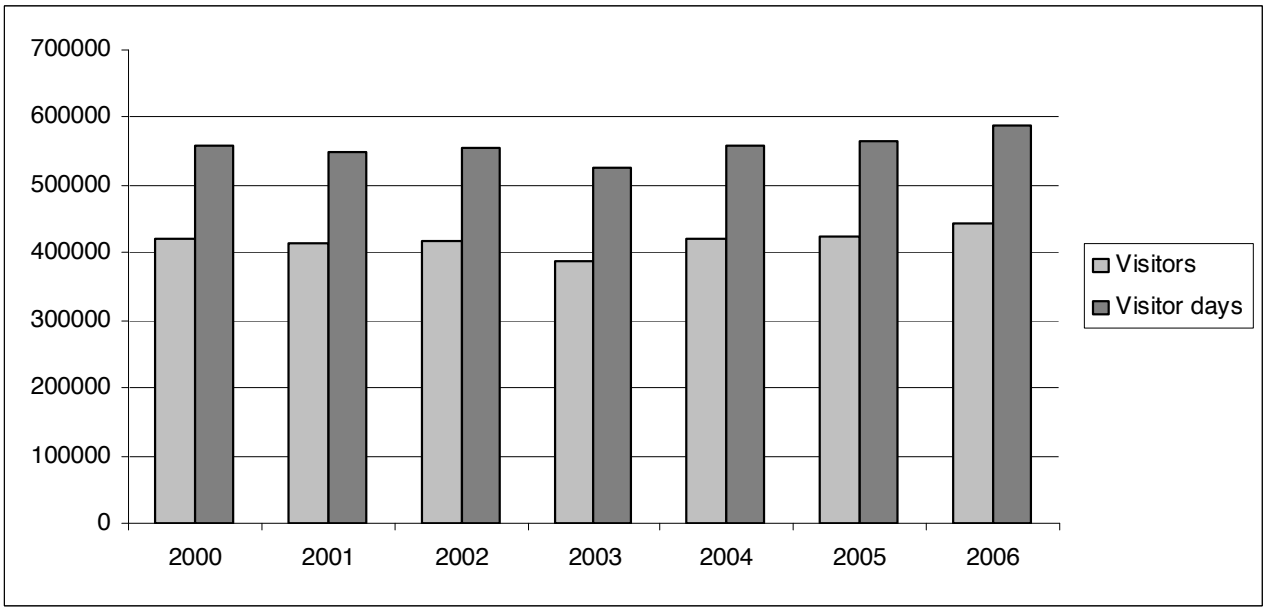
Table 11. Percentage of Visitors by Type Who Reported Participation in an Activity.

Activity \ Visitor	Premium Experience (%)	Habitual (%)	Casual Experience (%)
Driving/sightseeing	60	38	22
Hot pools	25	35	34
Hiking	13	15	26
Restaurants	14	13	11
Wildlife viewing		15	

Activity participation by less than 10 % of the visitor type is not reported. Data are insufficient to report on the Flow-through visitors.

Figure 5 compares the number of visitors and visitor days, including group tours, from 2000 to 2006. Just over half of the visits were repeat visits, with the average visit being 1.5 days in length. The average group size was 2.7 people, with most (75 %) making day trips to the parks as opposed to staying overnight. Only one third of visitors to the mountain parks as a whole were day visitors, suggesting that most visitors to Kootenay National Park seek their accommodation in other parks, likely Banff.

Figure 5. Visitation to Kootenay National Park, 2000 – 2006



In Kootenay National Park, the majority of visitors participate in softer or lower effort activities such as driving and sightseeing and visiting Radium Hot Springs. Just fewer than 20 % of visitors participate in hiking. The patterns and levels of use in Kootenay reflect the available facilities in

the park. Roughly 60 % of visitors took in the Hot Springs, and just less than half of visitors used other day-use areas along the Kootenay Parkway. Visitor use along the Parkway is higher in the spring and summer than in the fall and winter, while use of the Hot Springs is lower in the summer than in other seasons. Parks Canada is responding to this understanding of visitor use patterns by repairing or replacing deteriorating infrastructure at park day-use areas, and by maintaining high standards at the Hot Springs facility.

Indicator: Providing Opportunities

The second indicator of visitor experience is providing opportunities. This indicator includes consideration of the opportunities that are sought as well as those that are undertaken.

This indicator for Kootenay is rated as *fair* and *stable* between 2000 and 2006. This is primarily due to necessary facility closures after the fires of 2003 and assets in the park reaching the end of their design life. Both of these factors are being addressed at the time of this report and this indicator is expected to improve.

Kootenay National Park offers opportunities to experience the Rocky Mountains, to learn about their natural and cultural heritage, and to connect with nature. From semi-arid grasslands of the Rocky Mountain Trench to glacier-clad peaks of the Continental Divide, Kootenay National Park represents a diversity of landscapes, elevation, climate and ecology.

Established in 1920 as a corridor 8 km on either side of what is now known as Highway 93 South, a range of front-country and backcountry opportunities are available including: three drive-in campgrounds and one winter campground totalling 400 sites; 11 picnic sites and shelters; a visitor reception centre; strolling opportunities; self-guided interpretive trails; 72 campsites in 7 semi-primitive and wildland backcountry campgrounds; 214 kilometres of hiking, biking and horseback riding trails; and river touring. Winter activities include ice climbing, ski touring and winter mountaineering. Two commercial accommodation facilities are found in Kootenay providing 76 guest units.

Much of the infrastructure in Kootenay National Park was built decades ago. Some of these assets are reaching the end of their design life and need significant reinvestment. The work has begun, but approximately 13 % of assets in Kootenay National Park remain in poor condition, while only 18% of assets are in good condition. The majority of assets are rated in fair condition.

Driving highway 93 South is an experience in and of itself and seeing the park while driving is a common activity for many visitors. The Rockwall Trail is a prominent multi-day hiking opportunity – a 'must-do' for many backcountry enthusiasts. The interpretive trail at Marble Canyon provides a short hike for many visitors. The soothing waters of Radium Hot Springs, in a spectacular canyon setting, have long been a natural draw – from the first pool scooped out of the gravel by Aboriginal people to today's well developed pool facility. The hot springs, and their associated features of Sinclair Canyon and the Redwall Fault, are significant geological features. The trail to the cold, iron-rich mineral springs of the Paint Pots is another popular visitor destination that is a point of unique geological interest and a site of cultural and spiritual significance to First Nations.

Table 12 summarizes the seasonality of visits to the main day-use areas. Some areas see more or less use in specific seasons compared to the yearly average. For example, the Paint Pots day use area sees more use in the spring and summer and less use in the fall and winter.

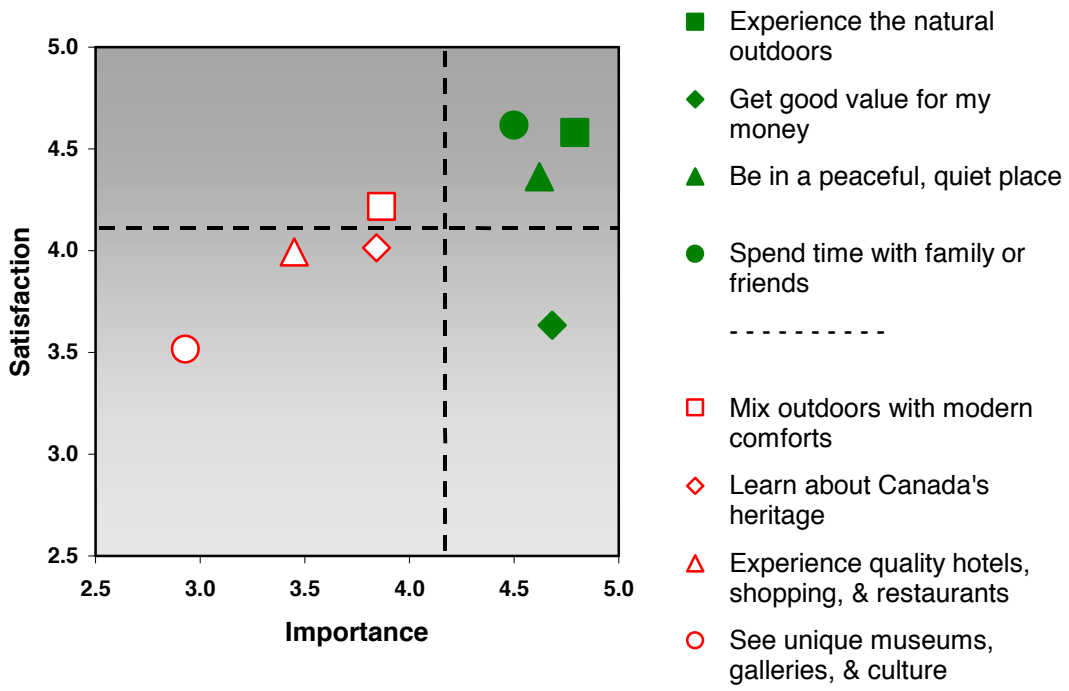
Table 12. Seasonal difference from yearly average in day-use area visits in KNP.

Area	Use compared to year-round average			
	Winter	Spring	Summer	Fall
Radium Hot Springs	=	=	↘	↗
Along Kootenay Parkway	↘	↗	=	=
Marble Canyon Area	=	=	=	↘
Paint Pots	↘	↗	↗	↘
Kootenay River	↘	↗	↘	↗

Symbol indicates higher (↗), lower (↘) or approximately equal (=) use to year-round average

To better understand the opportunities sought by and motivations of visitors, Figure 7 shows ratings of the importance of eight different opportunities to visitors' travel decisions. The satisfaction rating of these opportunities is also shown in the figure, and is discussed under *Quality Service* in the next section.

Figure 7. Importance and satisfaction of visit opportunities



Generally, participation in activities does not differ substantially by visitor origin, with a few exceptions. Canadian visitors from provinces other than Alberta tend to undertake more hiking, while visitors from Alberta and Europe visit the Hot Springs more so than visitors from other areas.

Indicator: Quality Service

Parks Canada has established targets for service quality in national parks and national historic sites: 85 % of visitors will be satisfied with their visit, with 50 % being very satisfied with their experience.

The assessment of satisfaction cannot be compared directly to these targets due to survey design, however it is clear from the information below that satisfaction with services in Kootenay is high. This indicator is therefore rated as *good* and *stable*.

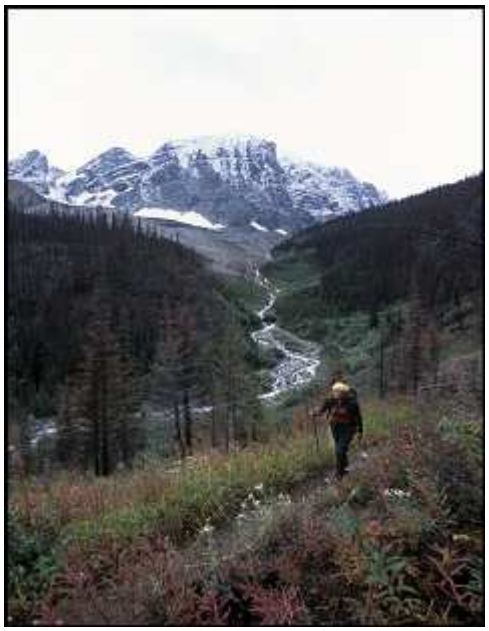
A comprehensive survey of visitors in 2003 showed that 82 % of mountain park visitors rated their visit as extremely enjoyable. The average score (on a five-point scale) for satisfaction with twenty services available in the mountain national parks was 4.1 (see Table 13). The top three ranked attributes had scores higher than 4.6 and included "My visit as a recreational experience", "Friendliness of park staff", and "Service in official language of choice". The lowest three ranked attributes had scores of less than 3.9 and related to value for money at attractions or activities, hotels or motels and restaurants in the park.

Table 13. Satisfaction of mountain park visitors with service attributes

Service Attribute	Mean Score (1 – 5 scale)
Service in official language of choice	4.8
Friendliness of Parks Canada staff	4.7
My visit as a recreational experience	4.64
The Columbia Icefields Snocoach Tour	4.44
Friendliness of business staff in the park	4.4
Guided walks / tours	4.26
History / geography info from the business staff in the park	4.18
My visit as an educational experience	4.12
The "Mountain Guide" publication	4.08
Parks Canada website	4.07
Pre-trip print publications	4.05
Education / interpretive programs	4.04
Tourism BC website	3.99
Availability of education / interpretive programs	3.94
Quality of education / interpretive programs	3.94
Value for entrance fee	3.92
Travel Alberta website	3.86
Value for money at attractions / activities in the park	3.85
Value for money at hotels / motels in the park	3.45
Value for money at restaurants in the park	3.34

Figure 7 in the previous section shows visitors' satisfaction with attributes they considered important. Generally, of the attributes that are important to visitors, satisfaction levels are high (greater than 4 out of 5 score). One attribute that is important to visitors but for which satisfaction was lower was value for money.

Indicator: Connecting Visitors Personally With the Place



Parks Canada's objective is not only to provide opportunities that are reflective of and appropriate to national parks and national historic site, but also to facilitate a meaningful, personal connection with the place. The result of personal connections will be that Parks Canada and the national parks and historic sites it operates are relevant to Canadians in the future and that Canadians support the Parks Canada program.

The concept of "Connection to Place " is under development and measures are not yet defined. Little objective data exists, so this indicator is not rated at this time. The following discussion presents some anecdotal information on visitors' connection to place.

One potential measure of connection to place is the level of understanding of the importance and value of national parks and national historic sites. As a first step to exploring this concept, Parks Canada examined visitors' recognition of heritage themes. On average, visitors answered three of six true/false questions correctly. European visitors and those from other countries answered slightly more questions correctly than did North Americans. These scores may reflect the different reasons for visiting national parks in the first place, as international visitors rated interest in learning about Canada's natural and cultural heritage as a stronger reason to visit than did North Americans.

Another means of gauging personal connection is the likelihood of a repeat visit. Repeat visits accounted for 57% of total park visits. Canadians from outside Alberta were more likely to be repeat visitors (78 %). When asked about their likelihood to return, 38 % of total visitors indicated that they "definitely" would.

Emerging Issues and Key Planning Considerations for Visitor Experience

The visitor experience in the park is facilitated in large part by the highway. Many visitors spend most of their time driving on the highway, or relaxing at popular day-use areas such as Radium Hot Springs. The motivation for some visitors is simply to travel the highway that links regional centres has such as Invermere, Radium Hot Springs, Canmore and Calgary. Populations in all these centres have increased in the past five years. The population increase in British Columbia is thought to be due in part to the development of weekend and holiday homes by Alberta-based (largely Calgary) residents. The population change of some of the relevant local markets is shown in the Table 14 below.

These park 'visitors' use the parkway on their weekend commute to holiday homes but don't necessarily make use of other park facilities. This segment may not have much motivation to experience other elements of the park, but reaching this group with stewardship messages related to wildlife mortality on the parkway will be important. Additionally, should these 'weekend residents' of the Columbia Valley retire near Kootenay National Park, they may become more active visitors and a potential audience. Widely quoted trends of baby boomers seeking recreational and educational activities close to home may apply to Kootenay National Park in the future.

Table 14. Population change near Kootenay National Park, 2001 – 2006

	Population (2001)	Population (2006)	Change (%)
Calgary, AB	951,494	1,079,310	13
Invermere, BC	2,858	3,002	5
Radium Hot Springs, BC	583	735	26
East Kootenay Area G*	1,635	1,563	– 4

*Includes towns and rural areas north of Radium Hot Springs to Spillimacheen

The Rockwall trail continues to be a popular backcountry destination. Additionally, the Alpine Club of Canada (ACC) Fay Hut sees significant use. Overall, use of ACC huts in the mountain parks, and Fay Hut in Kootenay, increased since 1997. Reliable data for backcountry campground use are not available for the same period, however anecdotal evidence suggests shorter (3 days vs. 5 – 10 days) overnight trips in the mountain parks. It is also thought that the baby-boom generation is increasingly seeking day-hiking opportunities or roofed accommodation in the backcountry.

Outdoor recreation retailers such as Mountain Equipment Co-op note a decline in sales of multi-day backcountry trip-related merchandise, suggesting fewer visitors making completely self-supported overnight backcountry trips. This information, combined with increases in the use of huts, suggests a possible shift in the type of infrastructure desired by backcountry users.

Radium Hot Springs and the Sinclair Canyon area are the most visited day-use areas of Kootenay National Park. A comparison of the age of visitors to the Hot Springs between 2001 and 2005 showed an increase in visitors between the ages of 41 to 50 and 51 to 60. An additional noticeable change in 2005 was increased use of hotels/motels (up 12 %) from 2001, and decreased use of campgrounds (down by 14 % from 2001) by Hot Springs users.

The front-country facilities in Kootenay National Park face the same kind of challenge and opportunity found in the other mountain national parks. A lot of aging infrastructure is near or beyond the end of its design life. It is also anticipated that there may be shifts in the type of experiences sought by park visitors.

Improving Parks Canada's understanding of the needs and expectation of visitors to Kootenay National Park will greatly aid in infrastructure and facility investment decisions. Anticipating the needs and expectations of an increased population base in the Columbia Valley is a key area of inquiry. Similarly, there may be an opportunity to match the many front-country or day-use area

opportunities in Kootenay with Parks Canada's desire to reach new Canadians, a segment of the population that often takes advantage of facilities that are accessible by vehicle.

An apparent shift in backcountry use (fewer visitors undertaking completely self-supported, long multi-day drips, increased use of roofed backcountry accommodation) may signal increased demand for opportunities such as hiking the Rockwall Trail or use of the ACC's Fay Hut.

In order to understand and facilitate connection to place, Parks Canada is seeking, through the Banff EcoIntegrity project, to create relevant educational opportunities for regional residents that effectively communicate key themes and messages. The results of this program may also be applicable to Kootenay National Park. The project aims to understand:

- the means and motivations for visiting;
- the learning opportunities to which visitors would be receptive; and
- the subjects visitors are interested in learning about.

Research was also done to understand what regional residents feel, think and do with respect to Banff and Parks Canada, and how this compares with what Parks Canada would like them to feel, think, and do. With this understanding, Parks Canada can design relevant communications programs and products that effectively form a bridge between visitor interests and needs, and the goals of Parks Canada in the mountain national parks.

3.4 Public Education

For most visitors, a visit to a national park is a departure from their daily routine and an opportunity for learning. Parks Canada and its partners provide information, opportunities and facilities so that people can have safe, enjoyable and rewarding experiences. One of the three "pillars" of the Parks Canada mandate is Public Education. Interesting, useful and accurate information will help people enjoy their visits and appreciate the importance of heritage places. Parks Canada provides many varied education programs in Kootenay National Park, and also seeks to connect with Canadians at home, at leisure, at school, and in their communities.

Visitors may be reached through campground or roving interpretive programs delivered in the park. Alternatively, information is available in the visitor centre in Radium Hot Springs, and through displays and other interpretive material. Interpretive media are also available at day-use areas along the Kootenay Parkway. Parks Canada's outreach efforts include delivery of school programs and the development of lesson plans for the British Columbia curriculum. Parks Canada and its partners facilitate tourism industry training opportunities through the Mountain Park Heritage Interpreters Association and by delivering *Discover Kootenay* to businesses in the Columbia Valley. Initiatives such as the restoration program on the Redstreak Bench and the monitoring and management of mountain pine beetle include education and interpretation objectives as well as ecosystem management objectives.

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 Park Report represents the first opportunity to view pubic education in Kootenay National Park in terms of these indicators. Past intermittent surveys, which were used for other purposes, are of limited value to broadly assess public education. A limited amount of information is presented in this section. No data are available about the total number of people who participate in the various programs, the level of understanding that may be imparted, or the long-term influence on attitudes, understanding and behaviour.

Indicator: Understanding Audiences

Traditional methods of public education need to be revisited, as many of today's visitors are seeking to direct their own experiences and to learn through hands-on opportunities. The market segments identified in the visitor experience section provide an insight into the use patterns, needs and expectations of park visitors.

Parks Canada is making strides in improving our knowledge of the audiences we want to reach, but further work remains. In the past few years, research in Banff National Park has contributed to our understanding and the results of this work are applicable to other mountain park visitors, including those that come to Kootenay. As a result, this indicator is rated as *fair* and *improving*.

One very important segment is the Habitual Users, the repeat regional audience that comprises 30% of park visitors. Surveys in Banff National Park, which are likely applicable to Kootenay, indicate a low participation by this group in current learning programs. Only 21% of participants in educational/interpretive programs are Albertans, compared to 29 % for other Canadians and 24% for Americans. Surveys of visitors from Alberta indicate that close to 50 % are motivated to learn more about the park, but not necessarily by attending interpretive programs and not when they are focused on an activity such as skiing. These data indicate that new approaches need to be developed to engage these audiences. One example of such efforts is "Survival on the Move", a CD about the effectiveness of wildlife crossing structures which is made available with the purchase of a seasonal park pass in Banff National Park.

The most common sources of pre-visit or en-route information include:

- past experience (46 %);
- maps (38 %);
- travel guidebooks (36 %);
- travel Alberta website (21 %); and
- Parks Canada website (18 %).

While in the park, visitors rely on information from:

- maps (42 %);
- Parks Canada information centres (33 %);
- past experience (27 %); and
- Parks Canada's *Mountain Guide* visitor information guide (20 %).

Indicator: Extending Our Reach

Parks Canada alone cannot reach more than a limited percentage of visitors. For the majority, their primary contact is often with hotel and retail store clerks (likely in neighbouring Banff National Park or the Radium area[3]) from whom they obtain information. Many of these service workers are new and temporary residents with limited knowledge of the park.

The condition and trend of this indicator is rated as *fair* and *improving*. Since 2000 significant improvements were made in how Parks Canada and its partners have reached visitors to Kootenay National Park.

The concept of heritage tourism is one way Parks Canada extends its reach to visitors and potential visitors. The preparation of a heritage tourism strategy is a prerequisite of redevelopment at the two commercial accommodations in Kootenay. These strategies are the key means of reaching visitors through other operators. The strategies outline the businesses' staff training and on-site guest interpretation and information programs. Parks Canada's own heritage tourism strategy is incorporated in the official community plan of the village of Radium Hot Springs.

In addition, Parks Canada works with Columbia Valley chambers of commerce in promoting and developing the heritage tourism product used by the tourism industry. The Radium Chamber of Commerce, the Friends of Kootenay National Park, the village of Radium Hot Springs and the Ktunaxa First Nation all collaborate with Parks Canada to reach the public through the visitor reception centre in the village.

Parks Canada also delivers the *Discover Kootenay* program to Columbia Valley businesses to raise and improve their awareness and knowledge of Kootenay National Park and the messages and information that are important for visitors.

Parks Canada supports or participates in a variety of initiatives in the Columbia V alley including Wild Voice for Kids, Big Horn in Our Backyard, Wings Over the Rockies and preparations for the celebration of the David Thompson bicentennial, all of which are venues for reaching residents and visitors.

[3] Most mountain park visitors stay overnight, but most of those visiting Kootenay are doing so only for the day.

Nationally, Parks Canada has identified three priority markets: new Canadians, those living in urban areas, and youth. Approximately 18 % of Canadians were not born in Canada (expected to rise to 30 % by 2026) and almost 80 % of Canadians live in urban areas[4]. These segments of the population represent important new markets for Parks Canada to build a constituency of support for the Agency and to ensure that Parks Canada remains relevant to Canadians in the future.

On a national level, Parks Canada is extending its public education reach into the nation's school systems through an online Teachers Corner resource and through the coordinating efforts of nine regional education specialists. In British Columbia, examples of participation in the classroom include development of four edu-kits for use by Columbia Valley teachers and participation in Wild Voices for Kids, a partnership of sixteen organizations that provides students with tools and knowledge to become effective and responsible stewards.

Indicator: Facilitating Understanding

Parks Canada facilitates public understanding of the park's heritage through its own educational and interpretive programming noted above and through partnerships with local organizations.

The success in facilitating public understanding in Kootenay National Park is *fair* and the results have been *stable* since the management plan was developed. The initiatives discussed below contribute to public education but reaching regional British Columbia residents remains a challenge.

The Mountain Parks Heritage Interpretation Association (MPHIA) interpreters' certification course is one very successful program. Since 1997, 292 professional interpreters have been accredited through this program, and almost 1300 others have received training. The program trains local guides to become knowledgeable ambassadors for the mountain parks, in effect multiplying the capacity of park staff to facilitate understanding.

Kootenay National Park provides opportunities for its visitors to learn about its unique cultural and natural significance. Key messages are delivered through interpretive programs, displays and panels, information brochures, and other information sources.

In a 2003 survey respondents were presented with six true/false statements that reflect six key messages Parks Canada hopes to communicate to its visitors.

On average, respondents correctly identified 3.1 out of six statements. The results varied little by origin, ranging from 2.8 for Albertans to 3.5 for Europeans. As with the overall results, these scores may reflect the higher propensity of visitors from some origins to seek learning opportunities.

Anecdotal measures of Parks Canada's success in facilitating understanding include support for the use of prescribed fire in and near the park and the shift in perception by Radium Hot Springs residents of Rocky Mountain bighorn sheep from being a nuisance to a symbol of their community. Additionally, to the degree that new non-personal interpretive media and increased roving interpreters are a proxy for facilitating public understanding, these efforts should improve the understanding of Kootenay National Park visitors.

[4] 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.

N/R

Indicator: Influencing Attitudes

This measure is under development and limited data are available for this report. As a result, this indicator is not rated.

As discussed above, acceptance of the use of fire as an ecosystem restoration tool appears to be growing. Similarly, there appeared to be community support for other restoration efforts in the Redstreak area of the park. This may be in part due to Parks Canada's efforts in increasing understanding, which in turn can influence attitudes. Conversely, speeding and highway mortality continue to be a problem on the Kootenay Parkway. Parks Canada has had limited success in changing driving behaviour or attitudes of parkway users.

Emerging Issues and Key Planning Considerations for Public Education

A key issue is the absence of targets, thresholds and measurement tools to assess public education. This is expected to improve in the future.

Key national trends that influence outreach education include:

- increased urbanization means there are opportunities for Parks Canada to connect urban Canadians and youth with their natural and cultural heritage;
- increased urban populations means a greater majority of people live in areas at a distance from most protected heritage areas, and the accessibility of Parks Canada visitor experiences may be an issue to this growing segment; and
- increased ethnic diversity results in a different and sometimes more complex value system with varied ways of relating to nature and culture.

4.0 Common Mountain Park Issues

Although each of the mountain national parks has some specific characteristics that are not shared with the others, there are enough similarities that the following common issues 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 history 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 ecological impacts and influence decisions about what can or should be done to mitigate, or adapt to, the 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, provides 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 increases in the provincial park systems in Alberta and British Columbia have provided an increased area of complementary park management.

5.0 Evaluation of Management Actions

Since the Kootenay National Park of Canada Management Plan was approved in 2000, Parks Canada and its partners have implemented a wide range of actions to maintain ecological integrity, protect cultural resources, and improve visitor experience and education. While not intended to be all-inclusive, Table 15 below highlights actions and results related to key strategies and initiatives presented in the Park Management Plan. Annual implementation reports provide additional detail about these and other park management actions and results.

Wildfires that burned extensive areas of Kootenay National Park in the summer of 2003 resulted in a significant reduction in visitor opportunities. Many popular facilities were lost or damaged in the fires, resulting in closures and access restrictions due to public safety concerns. Since 2003, restoration of popular visitor facilities and opportunities has been a focus of Parks Canada's management actions in Kootenay National Park (see Marble Canyon sidebar, next page).

Parks Canada takes an integrated approach to the protection of ecological and cultural resources and provision of quality visitor experiences and educational opportunities. Where possible, planning initiatives and management actions recognize the relationships between these aspects of the Parks Canada mandate.

Integration may take the form of a single project that simultaneously addresses protection, visitor experience and education objectives. Several discrete projects undertaken over a broader area may together represent an integrated approach to park management. While the individual projects may be focused on resource protection, visitor experience or public education, the cumulative objective is overall improvement in all areas of the mandate.

Results presented in the following table are generally based on qualitative evaluation, as many actions are recently implemented or ongoing. Where feasible, quantitative results are presented. 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.

Marble Canyon Restoration

In 2003 the Tokumm-Verendrye forest fire swept through Kootenay National Park and burned over the Marble Canyon day use area and interpretive trail. Fire crews were able to save the seven wooden bridges that cross Tokumm Creek along the interpretive trail. However, railings were destroyed along precarious steep sections of the trail, and numerous potentially hazardous trees were left standing near the trail. Consequently, the Marble Canyon trail was closed for public safety reasons.

A project to erect new safety fences and railings was initiated in 2007. Funding for this initiative was secured from Parks Canada's *Fees at Work* program, which distributes park entry fees to prioritized projects that improve visitor experiences throughout the mountain parks. Visitors can now enjoy the interpretive trail as before, with the added safety of new fences and handrails along most sections of the trail.

The restoration of the Marble Canyon trail has provided park visitors with a unique opportunity to learn about the role of fire on the landscape, as well as the fascinating history and geology behind the formation of the canyon. As visitors walk the trail and learn through the interpretive displays, they also encounter the real-time story of the rejuvenating forest unfolding right before their eyes, changing and regenerating with every passing season.

Redstreak Restoration Project

In 2007 Parks Canada began to implement an ecosystem restoration project in the Redstreak area adjacent to the Village of Radium Hot Springs. Decades of fire suppression in this area had resulted in a dense, closed forest where there once was an open forest and grassland ecosystem. This heavily forested area, located adjacent to the community and a popular campground, contained dangerous forest fuel loads that increased the risk of catastrophic wildfires.

This multi-year project includes forest thinning and prescribed burning aimed at restoring open forest and grassland ecosystems that provide habitat for a range of plant and animal species, including Bighorn Sheep, that do not thrive in the dense forests created through fire suppression. The restoration to more open habitat conditions will also help to protect the Village of Radium Hot Springs and the Redstreak Campground in Kootenay National Park from potential catastrophic wildfires. The project also provides an excellent opportunity to educate park visitors and regional residents about the importance of fire as a natural process that creates habitat diversity on the landscape.

To date, approximately 48 hectares of forest has been thinned on federal lands. Additional restoration work has been completed on adjacent provincial lands. Parks Canada has begun to prepare for the next phase of the project, which is a prescribed burn on Redstreak Mountain scheduled for fall or winter 2008. Initial burning to create fireguards has been completed.

As a result of this work Parks Canada has achieved improvements in ecological integrity, enhanced public education, and improved public safety and visitor experience in the Redstreak area of Kootenay National Park.

Table 15. Summary of management actions

Challenge/ Opportunity	Management Actions	Results
Maintain or improve visitor experience and learning opportunities in popular frontcountry areas while addressing related environmental concerns.	Sinclair Canyon and Redstreak Bench restoration, including forest thinning, prescribed burns, removal of outdated facilities, improvements to Radium Hot Springs pools, and utility infrastructure upgrades. Implementation of a campground reservation system. Improvements to several day use areas along Highway 93S, including upgraded washrooms, interpretive media and picnic facilities. Improved interpretive media and building renovations at the Radium Visitor Centre. Restoration of Marble Canyon campground and interpretive trail after 2003 fires. Removal of Marble Canyon Warden station. Removal of bear-attractive vegetation in Marble Canyon Campground. Extensive brushing along Highway 93S to improve sightlines.	Improved visitor experience and learning opportunities at hot pools, day use areas, campgrounds and Visitor Centre. Reduced fire risk to facilities in the Redstreak area. 90 hectares of open forest/grassland restored in the park. 114 hectares restored on adjacent provincial land. Improved habitat conditions for bighorn sheep, badger and other species. Local sheep population maintained within acceptable range. Improvement to wildlife travel corridors in the Redstreak, Sinclair and Marble Canyon areas. Reduced potential for wildlife-vehicle collisions and wildlife-human conflict, with associated increase in visitor safety. Reduced potential for water quality impacts related to day use area wastewater disposal.
Maintain quality backcountry wilderness experiences while addressing specific wildlife concerns, especially grizzly bear habitat security.	Improvements to several backcountry campgrounds in the Rockwall area, including bear-proof food storage facilities. Replacement of Floe Lake Trail Bridge after 2003 fires. Reconstruction of Fay Hut by Alpine Club of Canada after 2003 fires. Removal of Tumbling Creek/Ochre Creek backcountry campground.	Quality wilderness experiences maintained or improved in popular backcountry areas. Grizzly bear habitat security improved in less popular, higher quality bear habitat. Reduced potential for bear-human conflict.
Maintain the natural structure and function of aquatic ecosystems by addressing existing impacts.	Implementation of a zero possession limit for westslope cutthroat trout. Inventory and remediation of highway culverts impairing aquatic connectivity.	Reduced impact on native fish populations. Dolly Varden Creek culvert repaired, improving passage for fish. Inventory provides guidance for similar future projects.

Table 15 (cont'd): Summary of management actions

Challenge/ Opportunity	Management Actions	Results
Restore natural processes affecting vegetation and associated wildlife habitat values.	Implementation of prescribed burns, including Redstreak restoration, Crooks Meadows and Mt. Shanks. Natural fires in 2003 burned substantial portions of the Tokkum, Vermillion and Haffner valleys in the northern end of the park. Inventory and control of non-native plants in priority areas.	448.8 hectares subject to prescribed fire since 2000. 17,410 hectares burned during 2003 wildfires. Management plan target of 50 % of natural fire cycle surpassed. Substantially increased habitat diversity benefiting most wildlife species.
Improve understanding of factors influencing the park's ecological integrity, visitor experience and public education to inform park management decisions and to measure and report on progress.	Ongoing ecological monitoring and research related to various terrestrial and aquatic species and ecological processes. Improved social science, including visitor surveys and trail and traffic counters. Ongoing development of a consistent, scientifically rigorous long-term monitoring and reporting program incorporating social, ecological and cultural resource indicators. Production of the first State of Park Report for Kootenay National Park.	Better understanding of ecological and social factors and the relationships between people and the environment. Better understanding of visitors' activities, expectations and satisfaction levels to inform infrastructure investment and human use management approaches. As long-term monitoring program evolves, increased consistency and sound information to inform management decisions. Better public understanding and support of park management issues and progress.
Improve protection and presentation of cultural resources.	Development of a management plan for Kootenae House National Historic Site located outside of the park near Invermere. Preliminary inventory of the site. Participation in various initiatives to commemorate the David Thomson bicentennial.	Once implemented, the plan will result in increased protection and public understanding and appreciation of the site, and an improved visitor opportunity. Improved public understanding and appreciation for historic events.

Table 15 (cont'd): Summary of management actions

Challenge/ Opportunity	Management Actions	Results
Improve collaboration with aboriginal people, including improved presentation of aboriginal cultural heritage.	Participation in treaty negotiations with First Nations and provincial and federal authorities. Members of the Ktunaxa Nation initiated a Traditional Use Study, including inventories of areas disturbed during the 2003 forest fires. Consultation with representatives of the Ktunaxa Nation on the development of management plans for Kootenae House National Historic Site and other historic sites in the mountain parks. In partnership with members of the Ktunaxa Nation, development of new interpretive media at the Radium Visitor Centre with a focus on Aboriginal heritage.	Progress toward resolution of long-standing treaty issues. Improved relationships with local aboriginal people. Increased public and Parks Canada understanding and appreciation for local aboriginal history. Ktunaxa people employed at the Radium visitor centre. Aboriginal stories and historical perspectives incorporated in interpretive exhibits.
Strengthen heritage presentation and outreach programs so that Canadians and international visitors appreciate and understand the nature and history of the park, what the park can offer and what activities are appropriate.	Implementation of outreach programs to inform Columbia Valley residents and businesses about restoration activities in the Redstreak area. Staff participation in a variety of regional initiatives including Wings Over the Rockies bird festival, Wild Voices speaker series, Wild Voices for Kids and Bighorn In Our Backyard. Improved interpretive media at the Radium Visitor Centre and day use areas. Improvements to the park website, including additional pre-trip planning information and information related to ecological initiatives.	Increased public understanding, appreciation and support for natural and cultural heritage and related park management initiatives. Better public understanding of available visitor opportunities and appropriate activities.

6.0 SUMMARY ASSESSMENT

The state of heritage resources in Kootenay National Park is considered to be generally *fair* with a *stable* trend. However, several indicators and measures are rated as *poor* or show *declining* trends. Visitor experience and public education are both rated as *fair* with *improving* trends. For all categories there are some challenges and opportunities for improvement.

The following discussion summarizes the key issues identified in the Kootenay National Park of Canada State of the Park Report, and evaluates whether or not the current Park Management Plan addresses the key areas of concern adequately. Issues that may require attention during the upcoming review of the Park Management Plan are identified.

The report indicates that there are some significant challenges related to the maintenance of ecological integrity in Kootenay National Park, particularly as it pertains to wildlife and vegetation resources. The long-term viability of some regional wildlife populations such as grizzly bear and badger remains uncertain as a result of many pressures arising both from within and outside of the park. Within the park, highway-related mortality is a concern for many species. Development-related habitat loss, fragmentation related to forest harvesting and road development, and increased human activity on adjacent provincial lands contribute to these concerns. Large-scale fires and restoration work within the park are expected to provide a positive long-term influence on wildlife habitat values and populations.

Historical fire suppression activities have been significant contributors to increased native and exotic pathogens, such as mountain pine beetle and whitebark pine blister rust. The extent of non-native plants is increasing adjacent to busy roadways and front-country facilities.

The current Park Management Plan recognizes these threats to ecological integrity and identifies 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. In particular, restoration of fire as a dominant ecological process in Kootenay National Park, as well as removal of outdated facilities in important montane habitat areas are significant steps that are expected to result in tangible improvements to the future ecological integrity of the park.

Highway-related wildlife mortality, identified as a concern in the current Park Management Plan, continues to increase, and may require additional attention as part of the upcoming management plan review. This is a particularly challenging issue, as Parks Canada has minimal ability to influence the increasing traffic levels and speeds on Highway 93 South.

Aquatic ecosystems are faring relatively well in Kootenay National Park, with an overall good ecological integrity rating. This positive situation is likely the result of the minimal number of wastewater sources along the park's rivers, combined with ongoing improvements to aquatic resource protection and monitoring.

The current Park Management Plan broadly captures the full range of challenges related to aquatic ecosystems identified in this report and presents strategies or actions that are adequate to maintain the current positive situation. Impacts to aquatic connectivity as a result of highway culverts are of concern and are gradually increasing as culverts age and outfalls are eroded.

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 measures is warranted. There is widespread consensus that climate change is occurring and that there will be potentially significant ecological changes as a result, some of which may already be evident. More local monitoring will increase understanding, and may help to identify local effects. A review of the Park Management Plan should consider strategies to monitor and adapt to changes in climate.

The overall state of cultural resource management in Kootenay National Park also represents a significant challenge for Parks Canada. The recent focus of Parks Canada's cultural resource management efforts has been on National Historic Sites, which are subject to their own management plans and reporting processes, and therefore are not included in this evaluation. The cultural resources represented in this report have been a lower management priority, which is reflected in the fair or poor condition ratings for most measures.

The existing Park Management Plan recognizes the cultural resource management issues identified in this report and presents several actions to address known deficiencies. In particular, the need to improve cultural resource management practices through more rigorous inventory, evaluation and planning processes is apparent in both the State of the Park Report and the Park Management Plan.

The State of the Park Report highlights the need to acquire more information related to many visitor experience and public education indicators in order to maintain or improve performance in these areas. Although condition and trend ratings are largely based on anecdotal information and the judgement of specialists (supported by quantitative information in a few cases), some general issues and trends can be inferred from available data and local specialist knowledge.

While visitors to Kootenay National Park are generally satisfied with their experience, some opportunities for improvement are apparent. Many popular visitor facilities and associated infrastructure have become outdated or are in poor condition. The major fires of 2003 damaged, destroyed or rendered unsafe several visitor facilities and opportunities. Substantial progress has been made in the past few years to restore these facilities and related infrastructure.

The current Park Management Plan recognizes the need to provide high quality visitor experiences and provides strategies and actions to meet that objective. The fires of 2003, and the resulting visitor experience impacts, could not be anticipated. While substantial progress has been made in restoring or upgrading visitor facilities, there is an opportunity to better integrate visitor experience and ecological integrity objectives. Emphasizing the visitor experience as an outcome, rather than focussing primarily on visitor infrastructure, will lead to improvements in this area.

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. While the existing management plan identifies indicators and the need for improved monitoring and reporting specific to ecological integrity, similar approaches need to be applied to cultural resources, visitor experience and public education.

Finding ways to better connect Canadians and international visitors to Kootenay National Park in order to improve understanding, appreciation and support for national parks is an ongoing challenge for Parks Canada. The Kootenay National Park State of the Park 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 attention and long-term monitoring are required to ensure successful outcomes. In some cases, this report highlights specific areas that may benefit from additional attention during the upcoming management plan review.

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