



Model Class Screening Report For Land-Based Commercial Guiding Activities

In Banff National Park of Canada
Jasper National Park of Canada
Yoho National Park of Canada
Waterton Lakes National Park of Canada
Kootenay National Park of Canada
Glacier National Park of Canada
Mount Revelstoke National Park of Canada



Parks Canada Agency

September 2004



Parks Canada Parcs
Canada Canada

Canada

**Model Class Screening Report for
Land-based Commercial Guiding Activities
in the
Mountain National Parks of Canada**

**Banff National Park of Canada,
Glacier National Park of Canada,
Jasper National Park of Canada,
Kootenay National Park of Canada,
Mount Revelstoke National Park of Canada,
Yoho National Park of Canada, and
Waterton Lakes National Park of Canada**

**Parks Canada Agency
September 2004**

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Acronyms

BMP	Best Management Practices
CEA	Cumulative Effects Assessment
CEAA	Canadian Environmental Assessment Agency
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSPR	Class Screening Project Report
EA	Environmental Assessment
ESA	Ecologically Sensitive Area
ESS	Ecologically Sensitive Site
FA	Federal Authority
FEAI	Federal Environmental Assessment Index
ICH	Interior Cedar-Hemlock Ecoregion in Mount Revelstoke and Glacier National Parks of Canada
LMU	Land Management Units
RA	Responsible Authority as defined under the <i>Canadian Environmental Assessment Act</i>
MCSR	Model Class Screening Report
The Act	The <i>Canadian Environmental Assessment Act</i>
WCSC	Western Canada Service Centre

1. Introduction

Commercial guiding within the national parks of the Canadian Rocky Mountains has a long history dating back to the early days following the completion of the Canadian Pacific Railway. Groups such as the Swiss Guides, working in collaboration with the Canadian Pacific Hotels, the Alpine Club of Canada, and the Trail Riders of the Canadian Rockies have been conducting guided mountaineering and horse packing tours in the mountains since the beginning of the 20th century. Guiding activities in the mountain parks have expanded over time beyond the scope of mountaineering and horse packing to include hiking, skiing, and snowshoeing as well as a number of aquatic based activities.

Commercial guiding services provide a number of benefits to park visitors, park staff and the park environment. The services of a professional guide may provide the only means for many unskilled or inexperienced park visitors to safely and comfortably, visit and appreciate more remote areas of the parks. Guides often take the opportunity to inform clients about the region's physical and cultural characteristics, as well as educate them on issues related to ecological integrity, good environmental practices, and park management. Many guiding operations have a strong focus on outdoor skill development and safety leading to an increase in the number of experienced and skilled backcountry users, which in turn, results in fewer incidents that may require park rescue services. Finally, the presence of skilled, professional guides provides an additional measure of safety for backcountry visitors, even for independent users. Guides have taken part in rescues managed by the warden service, have performed rescues independent from parks staff (usually for non-guided parties), and have voluntarily taken on the responsibility to guide independent visitors through difficult weather and water conditions.

Uncontrolled commercial guiding activities may also have negative impacts on the park environment. The activities of commercial guiding operations may increase user numbers in sensitive areas of the parks that would otherwise see lower use. Some guiding operations are associated with large group sizes and seasonal or repetitive use patterns that may result in increased disturbances to vegetation, wildlife and visitor experience.

As a prerequisite to obtaining a business licence, commercial guiding operators within a national park are required to conduct an environmental assessment pursuant to the *Canadian Environmental Assessment Act* (the *Act*) of their current and projected future guiding activities. The Class Screening process under the *Act* provides an appropriate, efficient, fair, flexible and consistent approach to the environmental assessment of commercial guiding activities. A Class Screening approach can also be readily adapted over time to accommodate both park and business operational changes, and new information related to changing patterns of visitor use or visitor use issues. This Model Class Screening Report will address land-based commercial guiding activities for the seven Rocky Mountain national parks in Alberta and British Columbia which can cover over 100 business licence applications.

1.1. Management of National Parks

National parks are "dedicated to the people of Canada for their benefit, education and enjoyment ... and shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations" (*Canada National Parks Act 1998*). The approach taken for the environmental assessment of commercial guiding activities recognizes the benchmarks of ecological and commemorative integrity that are mandated to the Parks Canada Agency for the management of national parks and historic sites. The approach also recognizes that outdoor recreation in national parks is considered to be an appropriate use in accordance with Parks Canada policy and that the quality of the visitor experience is an important consideration in management decisions.

1.1.1. Managing for Ecological Integrity

The *Canada National Parks Act* Section 8(2) identifies the importance of protecting park resources in relation to visitor use by stating "the maintenance or restoration of ecological integrity, through the protection of natural resources and natural processes, shall be the first priority of the Minister when considering all aspects of the management of parks."

The *Canada National Parks Act* Section 2(1) states "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 operational terms ecosystems can be characterized in terms of composition, structure and process. An ecosystem can be considered to have integrity when native components (plants, animals and other organisms), physical structure (such as habitat connectivity or vegetation patterns) and processes (such as interspecies competition and predation) remain intact and function unimpaired by human activities. Conversely a loss in ecological integrity can be characterized by changes to physical structure, or interference with ecosystem processes as a result of human activity, that result in a loss of native species biodiversity.

Indicators of, and stressors affecting, ecological integrity as identified in park management plans were reviewed to identify the environmental components most likely to be affected by commercial guiding activities.

1.1.2. Managing for Cultural Resources

The protection of cultural resources is a priority for Parks Canada, with the highest obligation being to protect and present those resources of national historic significance in order to retain their historic value and extend their physical life (*Canadian Heritage Parks Canada 1994*). The protection of cultural resources also involves the consideration of the cumulative impacts of any proposed actions concerning the historic character of cultural resources, the goal being to preserve cultural integrity.

A cultural resource is defined as "a human work, or a place that gives evidence of human activity or has spiritual or cultural meaning, and that has been determined to be of historic value." (*Canadian Heritage Parks Canada 1994*). Within national parks cultural resources

are inventoried and assigned a value based on the particular qualities and features that make up their historic character. Resources are evaluated for their historical associations, their aesthetic and functional qualities and their relationships to social and physical environments (Canadian Heritage Parks Canada 1994). National Historic Sites are assessed for their cultural integrity, the wholeness of the site's resources that represent its national significance. National historic sites located within the national parks and other cultural resources are considered to be potentially sensitive sites for the purposes of the environmental assessment of commercial guiding activities.

1.1.3. Managing for Visitor Experience

The *Canada National Parks Act* states that "The national parks of Canada are hereby dedicated to the people of Canada for their benefit, education and enjoyment...". To fulfill Parks Canada's mandate of facilitating the education and enjoyment of national parks by the public, a variety of outdoor recreation opportunities are permitted consistent with direction provided by Parks Canada Guiding Principles and Operational Policies (Canadian Heritage Parks Canada 1994). Outdoor activities that promote the appreciation of a park's purpose and objectives, and respect the integrity of the ecosystem, are intended to serve visitors of diverse interests, ages, physical capabilities and skills. The private sector and non-governmental organizations are encouraged under park policy to provide skills development programs that will increase visitor understanding, appreciation and enjoyment of the national parks. Individual park management plans specify the types and ranges of both new and existing appropriate outdoor recreation activities and their supporting facilities. Parks Canada, working in cooperation with others, is committed to offering high-quality visitor services by ensuring that park resources do not deteriorate and that quality visitor experiences are not diminished.

Commercial guiding is a traditional park activity dating back to the early 1900s. The contribution of the private sector in the delivery of "skills development programs that will increase visitor understanding, appreciation and enjoyment of the national parks" is recognized under Section 4 of *Parks Canada Guiding Principles and Operational Policies*. Land-based commercial guiding activities provide a number of benefits to park visitors, park staff and park residents including:

- Ø Safe access to the backcountry for unskilled or inexperienced visitors
- Ø Visitor education on the physical, biological, and cultural resources and ecological integrity of the national parks
- Ø Outdoor skills development and safety training
- Ø Skilled resource pool for dealing with emergencies and rescues
- Ø Job opportunities and economic benefits.

1.1.4. Park Management Plans

In order to fulfill the mandates for ecological integrity, cultural resources and visitor experience, management plans are developed for each park and reviewed every five years. These documents are tabled in parliament and contain "a long-term ecological vision for the park, a set of ecological integrity objectives and indicators and provisions for resource protection and restoration, zoning, visitor use, public awareness and performance evaluation" *Canada National Parks Act* Section 11(1). Management plans

provide the direction for all activities within the park. Based on the management plan, human use strategies and other plans can be developed to further direct activities within the parks.

The park management planning process includes public input and review, strategic environmental assessment and Ministerial approval prior to being tabled in parliament. As a result of the intensive management planning and review process, issues related to the cumulative impacts of overall management of human use are addressed more appropriately within the scope of the management planning process including:

- Ø Appropriate use of park lands and facilities (e.g. Winter use of specific areas)
- Ø Management and maintenance of park facilities
- Ø Management of overall visitor use levels
- Ø Commercial business licence allocations or restrictions
- Ø Area closures, visitor use restrictions or zoning.

1.2. Applicability of the Class Screening Process to Land-Based Commercial Guiding Activities

The *Canadian Environmental Assessment Act* (the *Act*) was brought into force in 1995 to establish a Canadian environmental assessment process for projects in which the federal government has decision-making authority. The purpose of the *Act* is to consider the effects of projects on the environment before irrevocable decisions are made.

The *Act* applies to projects where a Federal Authority (FA) performs one or more of the following duties, powers or functions in relation to that project:

- ≠# proposes the project;
- ≠# grants money or other financial assistance to a project;
- ≠# grants an interest in land for a project; or
- ≠# exercises a regulatory duty in relation to a project, such as issuing a permit or licence that is included in the *Law List Regulations* as prescribed under the *Act*.

The majority of projects subject to the *Act* are assessed through a screening level assessment. Screenings are self-directed assessments, where the FA (as proponent, land administrator, funder or regulator), takes responsibility for the environmental assessment and acts as a Responsible Authority (RA) under the *Act*. Section 19 of the *Act* outlines a “class screening” process for assessing groups of projects that: deal with similar issues, are relatively small in scale and size, and have predictable and mitigable environmental effects.

A Model Class Screening is a two-part process involving a model class screening report and a class screening project report form:

Model Class Screening Report (MCSR) – The MCSR sets out an environmental assessment process for projects within the class. The MCSR typically includes the rationale for the projects included in the class, the rationale for the scope of those projects and the scope of the assessment, typical environmental effects, mitigation measures, a

determination of significance of any effects following mitigation, and follow-up and monitoring requirements. A MCSR also describes the process and procedures under which future projects will be assessed, including responsibilities, documentation requirements, amendment mechanisms and public consultation requirements.

Class Screening Project Report Form (CSPR Form) - The CSPR Form is the project specific screening report that must be completed for each project assessed under the MCSR. These forms are prepared in accordance with the procedures outlined in the MCSR and contain additional site-specific information to supplement information contained in the MCSR. The CSPR, together with the MCSR provide the basis for meeting the requirements of the *Act*.

The class screening process is intended to provide a greater measure of predictability, consistency, and timeliness to the environmental assessment process. Benefits to the process include:

- ⌘ Improvements in the effectiveness of the EA process
- ⌘ Savings in time and resources
- ⌘ Streamlining project approvals
- ⌘ Demonstrating accountability (Anonymous 1992; Candian Environmental Assessment Agency 2000).

The commercial guiding activities addressed through this class screening have many common characteristics. The subject group of activities are land-based, non-motorized, make use of common trails, staging sites and backcountry areas, overlap in terms of seasonal use, and have similar environmental effects. Land-based commercial guiding is well suited to the application of the class screening process because of the common characteristics, overlapping geographic and temporal scope, and the generally predictable and mitigable environmental effects.

1.3. Key Issues and Challenges

A number of key issues and challenges exist related to the environmental assessment of commercial guiding activities.

- ⌘ Many impacts of guided activities are typically mitigated through the application of standardized best management practices. However site-specific environmental concerns exist that may not be mitigated through standardized best management practices. A key challenge of the assessment is to apply an appropriate level of detail to the evaluation and mitigation of site-specific environmental issues.
- ⌘ Guided recreational use is only one of many activities taking place within the mountain parks. A key challenge is identified in terms of specifying and justifying realistic, effective and fair mitigation measures given the relative contribution of guided activities to cumulative environmental effects in a given area.
- ⌘ There is a paucity of data and inconsistent quality of information on visitor use in and between different parks. The lack of consistent information makes it difficult to accurately identify areas of concern and evaluate the relative contribution of

commercial guiding activities to cumulative environmental effects in a given area, and to do so consistently from park to park.

- ⊘ There is a lack of information on the effects of human disturbance on sensitive wildlife in the parks. This is particularly true for sensitive species that may be used to evaluate the impacts of winter activities on wildlife.
- ⊘ A key environmental assessment challenge is to link mitigation and management of commercial guiding to the broader visitor use management picture including guidelines and thresholds established by Parks Canada.
- ⊘ Patterns of visitor use, the type, number, size and nature of commercial operations, and priority environmental issues may be considered to be dynamic over time. A key environmental assessment challenge is the development of an adaptive management process that can identify, evaluate and address changes to commercial operations and incorporate new information over a regular period of time.

The class screening process for land-based commercial guiding activities has been developed to address the requirements of the *Act* and the key issues and challenges presented above. To a large degree, key challenges are related to current limitations in the available data and information base. Expanding the available information base will require the development of monitoring and information gathering programs targeted at filling designated information gaps. However in the interim, the available data and the expert knowledge of Parks Canada staff provide adequate information for the conclusions outlined in the MCSR. In addition, Parks Canada will be able to respond to new information through the CSPR process and links to the management planning processes outlined in the MCSR.

The class screening process:

- ⊘ Provides a consistent, scientific approach across the mountain parks to the identification, evaluation and mitigation of environmental effects related to commercial guiding activities
- ⊘ Addresses site-specific and cumulative environmental effects and mitigation
- ⊘ Provides an assessment tool that is consistent and fair to operators and recognizes the responsibility shared by Parks Canada to mitigate the cumulative environmental effects of all visitor impacts
- ⊘ Provides an adaptive management process by which the environmental assessment of commercial guiding activities can be evaluated and improved over time
- ⊘ Is consistent with the *Act* and with management direction provided by the *Canada National Parks Act*, parks policy and park management plans.

1.4. Development of the Class Screening

Park specific information was researched, compiled and written by field unit environmental assessment staff. The Western Canada Service Centre office of Parks Canada in Calgary provided Geographic Information System (GIS) analysis for the project. Service Centre staff in Calgary and Winnipeg coordinated the preparation of the MCSR document. Park staff, commercial operators, and environmental groups were

provided with the opportunity to review and comment on the draft MCSR prior to submission to the CEAA. The following steps were used to develop the MCSR.

Step 1: Definition of the project class

The first step in the development of the MCSR was to review the business licences issued in the mountain parks to determine if they are subject to CEAA and may be amenable to and benefit from a class screening assessment approach. From this review the licences that would be included in this MCSR were identified and grouped into sub-classes.

Step 2: Description of the environmental effects

The second step in the process was to identify and describe the potential environmental effects of the projects that are covered by the MCSR. The environmental setting in each park was described, including sensitive environmental and cultural sites. National park zoning and land management units, Aboriginal land use and socio-economic context were also discussed. The activities for each sub-class were described in detail. Potential activity-specific and site-specific environmental effects were described and analyzed.

Step 3: Identification and Development of Best Practices

Best practices were developed based on literature and consultation with park staff. This process included the following:

- ⌘ Identifying the potential environmental effects of the project and associated activities;
- ⌘ Identifying appropriate best practice to mitigate the environmental effects that are considered likely to occur;
- ⌘ Assessing potential effects of accidents and malfunctions;
- ⌘ Considering the potential for cumulative environmental effects; and,
- ⌘ Identifying potential residual adverse environmental effects and their likely significance.

Step 4: Development of the format and requirements for the Class Screening Project Report (CSPR form)

The fourth step in developing the MCSR was to identify and outline the process and procedures through which a screening of a project subject to the class would be completed. This involved examining the results of steps 1, 2 and 3 and incorporating them in the screening process. Once the screening process was determined, the format and requirements for the CSPR form were identified.

The CSPR Form allows for the collection of site and project-specific data to supplement the information and procedures contained in the MCSR.

Step 5 - Preparation of the Model Class Screening Report (MCSR)

In this step, the results of all of the previous steps were brought together to form the MCSR. The MCSR documents all aspects of the development and application of the class screening process including project and environment descriptions; the identification of environmental effects and mitigations; the procedure for applying the CSPR to project

activities; follow-up and monitoring requirements, and; procedures for amending the class screening.

Step 6 - Submission to the Canadian Environmental Assessment Agency for review and declaration

The MCSR was submitted to the CEAA for declaration in accordance with the requirements of the *Act*.

The CEAA published a notice in the *Canada Gazette* and local media inviting comments from the public on the appropriateness of using the proposed MCSR; the review period took 30 days. The CEAA also sent direct notices regarding the availability of the report to interested organizations and individuals. The CEAA ensured that all of the relevant comments received were adequately addressed within the MCSR. If the public comments had raised issues that were not been adequately addressed in the model class screening report, the CEAA would have referred the proposed model class screening report back to Parks Canada for further consideration.

The MCSR was declared once the CEAA determined that the issues raised in the public comments were adequately addressed, and that the MCSR met the requirements of the *Act*. An official notification was then published in the *Canada Gazette*. Notification was also provided to those organizations and individuals who provided comments on the proposed model class screening report.

1.5. Application of the MCSR to the Business Licence Process

1.5.1. Integration of Environmental Assessment and Business Licence Administrative Process

The business licencing process and the environmental assessment process are individual legal requirements mandated by separate legislative requirements under the *Canada National Parks Act* and the *Canadian Environmental Assessment Act*. However, the requirements for issuing a business licence encompass the requirements for environmental assessment under the *Act*. In order to ensure operational efficiency and consistency, and to facilitate cumulative effects assessment, the environmental assessment process has been integrated into the overall business licencing process.

The National Parks business licence administrative process will continue to operate, as it has in the past, on an annual basis. The issuance of licences, collection of licence fees, and reporting requirements will be completed annually. Application for new, expanded or altered commercial guiding operations will also be considered on an annual basis. The licencing process can be divided into three stages as illustrated in Figure 1:

- Ø Licence Pre-screening
- Ø Licence Application and Team Review
- Ø Monitoring and Annual Reporting.

Environmental assessment requirements are incorporated within the licence application and team review stage. A brief description of the stages is outlined below.

Licence Pre-screening

At this stage, applications for new, expanded or altered licences for commercial guiding operations are reviewed by Parks Canada against existing appropriate use policy, and management plan direction. Applications that are not consistent with policy and management plan direction may be rejected or returned to the applicant for modification. Applications that are considered to be compatible with policy and management plan direction may proceed to the licence application stage.

Licence Application and Review

There are two streams to the licence application stage; the licence application itself, and; the environmental assessment process. The licence application deals with the nature and administration of the business itself including collection of information on contacts, management, office location, business size, nature of the business etc. Stipulations on group size, guide/client ratios, public safety, and certification requirements are applied based on approved and standardized business licencing policies and procedures. The environmental assessment process may take the form of either a class screening as outlined in this MCSR, or a regular screening under the Act. Both the licence application and the environmental assessment must be completed and reviewed by business administration, public safety and environmental assessment staff within Parks Canada prior to proceeding to the next stage. At any point in the review it may be necessary for Parks Canada to request additional information from the applicant in order to properly assess the application.

Licence applications are received and reviewed by a Parks Canada team in the spring of every year. The team review focuses on the identification of additional site-specific issues and mitigation, on the identification of cumulative effects issues and mitigation, and on potential impacts to park facilities, budgets, and public safety. Mitigations required by the environmental assessment are attached as a condition of the business licence. Failure to reasonably comply with the mitigation could result in the cancellation of the business licence. The review team may add additional stipulations and mitigations to the business licence for an individual operation to deal with site-specific or cumulative effects, or other operational concerns as required. Finally the review team makes a recommendation to the Park Superintendent with respect to licence approvals.

Annual Reporting and Monitoring

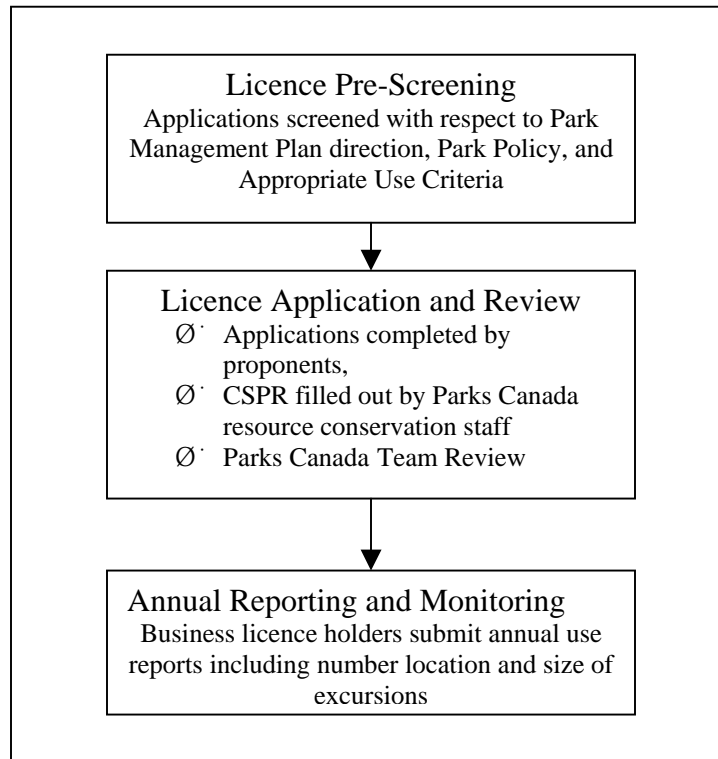
Business licence holders are required to submit annual reports on commercial activities including the number, location, and size of excursions. Reports are submitted to and held in an electronic database that can be used to confirm and evaluate patterns of commercial use over time. Annual reports are used as baseline information for the Parks Canada Team Review and for the identification of cumulative effects issues and mitigation.

1.5.2. Application of Section 13.1 Inclusion List Regulations

In accordance with section 13.1 of the Inclusion List Regulation, completed and approved environmental assessments conducted through the Class Screening process will be considered valid unless the scope and nature of the business changes. Commercial guiding operations that do not plan to significantly alter or expand commercial operations will not require a new or updated environmental assessment until the scheduled five year

class assessment review. Every five years following the completion of the class assessment review, each commercial guiding operation will be reevaluated and notified as to whether a new or updated environmental assessment will be required or not.

Figure 1: Business Licence Process Overview



1.5.3. Class Screening Project Report

The Class Screening Project Report (CSRP) functions as the environmental assessment documentation for business licence applications that are assessed using the Class Screening process. Sections of the CSRP that document the proposed business activities are completed by the applicant. Sections of the CSRP that evaluate the environmental impacts of the proposed business activities are completed by Parks Canada.

The class screening project report is divided into six sections:

- ⚡ Section 1 provides proponent identification and references the business licence application number.
- ⚡ Section 2 provides information to ensure the class screening applies to the proposed activity.
- ⚡ Section 3 describes the activities being proposed and identifies the standard mitigation requirements for activity-specific and site-specific environmental impacts.
- ⚡ Section 4 identifies any additional environmental effects and mitigation required with respect to the proposed activity.
- ⚡ Section 5 identifies potential cumulative effects associated with the proposed project and specifies cumulative effects mitigation as required.
- ⚡ Section 6 records the decision statement and signature of the Responsible Authority.

1.5.4. Roles and Responsibilities

Parks Canada is the sole Responsible Authority under the *Act* as well as the sole business licensing authority in the National Parks. Parks Canada will be responsible for reviewing completed CSPRs submitted as part of a business licence application, for making a determination of significance of environmental effects, and for incorporating the appropriate mitigation measures as outlined in the MCSR as conditions of a business licence approval.

Business licence applicants will be responsible for submitting completed CSPRs along with their business licence application. Licence holders will be responsible for notifying Parks Canada in the event that their business operations are expanded beyond the scope of activities approved in the business licence and assessed under the Class Screening process. Licence holders who wish to expand their operations may be required to reapply for a new licence and complete a new CSPR at the discretion of Parks Canada.

1.6. Projects Subject to the Model Class Screening

1.6.1. Projects subject to the *Act*

All commercial guiding operations in national parks (other than in the town of Banff) require a business licence in accordance with direction provided by Section 3 of the *National Parks Businesses Regulations 1998*. Section 13.1 of the *Inclusion List Regulations* under the *Act* defines recreational activities that take place outdoors in a national park, outside of a town or visitor centre, as projects under the *Act*. Because a permit is required pursuant to subsection 5.1 of the *National Parks Businesses Regulations 1998* (included in section 24.1 (Schedule I, Part II) of the *Law List Regulations* under the *Act*), the issuance of this authorization triggers the *Act* and an environmental assessment is required. Subsection 5.1 of the *National Parks Businesses Regulations 1998* requires that the superintendent consider the effects of a business on:

- ⌘ the natural and cultural resources of the park;
- ⌘ the safety, health and enjoyment of persons visiting or residing in the park;
- ⌘ the safety and health of persons availing themselves of the goods or services offered by the business; and,
- ⌘ the preservation, control and management of the park.

The net result of applying the above regulations is that all commercial guiding operations require a business licence and prior to the issuance of a business licence the proposed operation must undergo an environmental assessment under the *Act* as a means of evaluating the impacts of the business on the park.

1.6.2. Projects excluded from the *Act*

The *Exclusion List Regulations* under the *Act* make no provision for excluding any type of commercial guiding activity from assessment. Proposed commercial guiding activities that have been previously assessed either under the *Act* or under the Federal Environmental Assessment and Review Process Guidelines Order may be exempted from

further environmental assessment in accordance with provisions in Section 13.1 of the *Inclusion List Regulations*.

1.6.3. Projects subject to the MCSR

Commercial guiding activities included within the scope of the model class screening report include all non-motorized, land-based guiding activities taking place in Zone I, II or III areas of Banff National Park of Canada (hereafter Banff), Glacier National Park of Canada (hereafter Glacier), Jasper National Park of Canada (hereafter Jasper), Kootenay National Park of Canada (hereafter Kootenay), Mount Revelstoke National Park of Canada (hereafter Mount Revelstoke), Yoho National Park of Canada (hereafter Yoho) and Waterton Lakes National Park of Canada (hereafter Waterton) (Figure 2). Specific activity subclasses include:

- ⌘ Guided hiking
- ⌘ Mountain guiding (rock climbing and general mountaineering)
- ⌘ Horse outfitting (day trips and pack trips)
- ⌘ Winter use (skiing and snowshoeing on and off established trails, ski mountaineering, ice climbing)
- ⌘ Overnight use (camping, bivouacs, fire, food handling, waste disposal).

These subclasses are not meant to be mutually exclusive. Rather, activities were separated to make it easier to analyze the activities for environmental effects and identify mitigations. The list of specific activities covers most land-based commercial guiding services known to be currently operating in the mountain parks. The list does not include all recreational activities that may occur in national parks, only those that are the focus of current guiding services.

1.6.4. Projects not suited to the MCSR

Limitations to the scope of the project were identified to address pragmatic environmental assessment purposes. Limiting the scope of the project to land-based commercial guiding activities defines an environmental assessment that was felt to be manageable in terms of time and scale, addresses similar activities and similar environments, and addresses activities with clearly overlapping and cumulative environmental impacts.

Some commercial guiding activities conducted in the Parks do not meet the model class screening requirements of being non-motorized, land-based guiding activities taking place in Zone I, II or III areas. Other activities do not meet the requirements of being routine, repetitive activities with known, easily mitigable environmental effects. Activities that fall outside these categories are not included within the scope of the MCSR. Activities that require a lease or licence of occupation are also not included within the scope of the MCSR.

Projects that are not suitable for application of the model class screening also include those that may adversely affect species at risk, either directly or indirectly (for example by adversely affecting their habitat). For the purposes of this document, species at risk include:

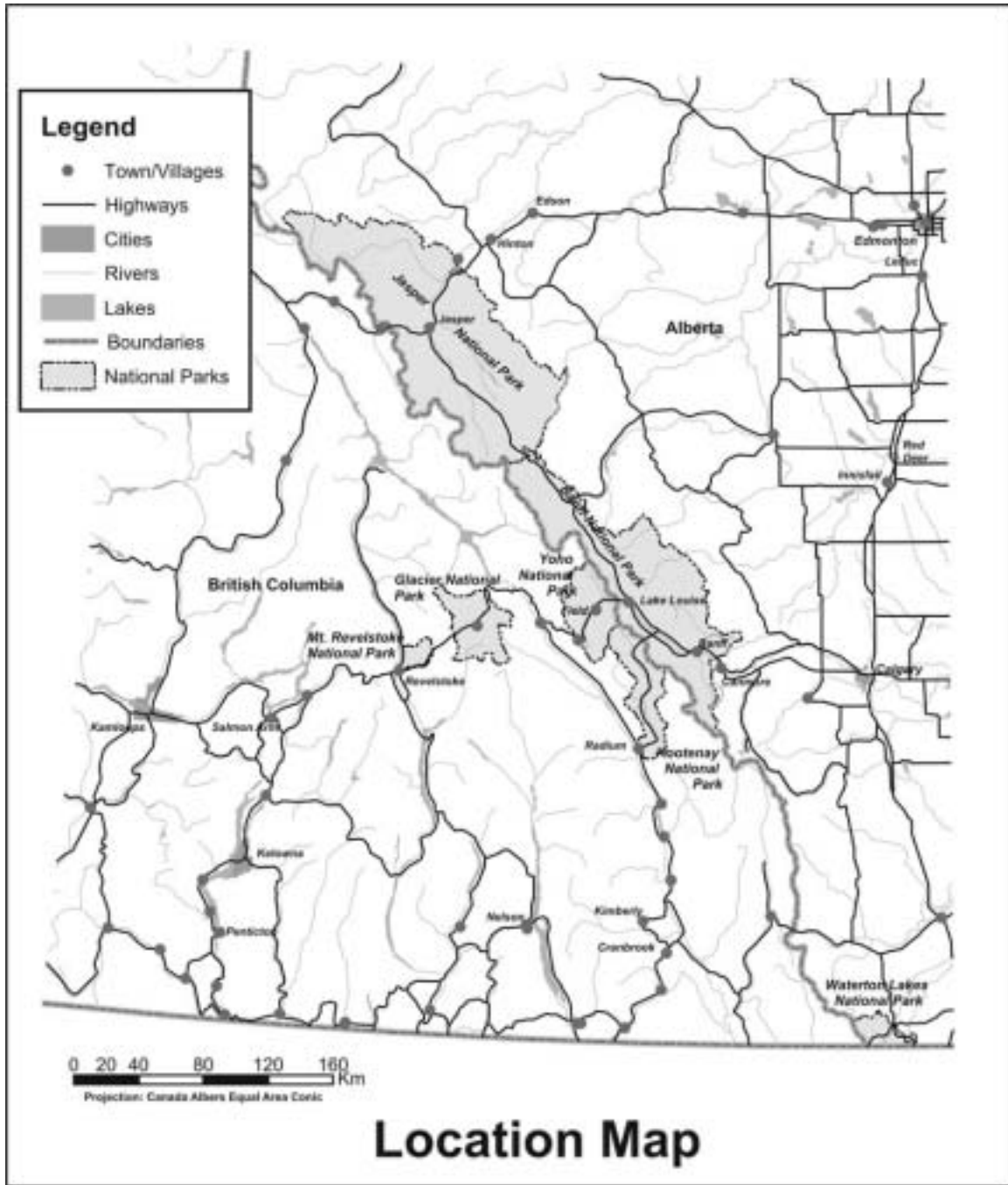
- ☞ species identified on the List of Wildlife Species at Risk set out in Schedule 1 of the *Species at Risk Act (SARA)*, and including the critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*;
- ☞ and species that have been recognized as "at risk" by COSEWIC or by provincial or territorial authorities.

Specific projects that are not included within the scope of the MCSR include:

- ☞ Facility-based recreational activities such as boat rental operations, marinas, backcountry hut, lodge and camp operations;
- ☞ Ski hill and golf course operations and activities;
- ☞ One-time, occasional or annual special events such as military exercises, sporting events, or festivals;
- ☞ Recreational activities that rely on vehicle support such as motorized boat tours, cycle tours and wildlife "safari" tours;
- ☞ Aquatic-based commercial guiding activities.

In addition to the above list, new types of guided activities, and those not listed in Section 1.6.3, are not included within the scope of the MCSR and must undergo an individual environmental screening.

Figure 2: Location Map



1.7. Scope of the Environmental Assessment

The scope of the environmental assessment for commercial guiding activities must remain consistent with management directions already initiated with respect to ecological and cultural integrity and the quality of visitor experience as outlined and assessed in individual park management plans. Existing management direction is used to focus the environmental assessment on the most relevant management issues. The mitigation identified within the MCSR and CSPRs will be consistent with the management plans, human use strategies and any other appropriate guiding documents.

1.7.1. Scope of Factors to be Considered

The environmental assessment of commercial guiding activities is based on factors as outlined in section 16(1) of the Act. Management plan direction is used to focus the environmental assessment on the most relevant management issues through identification of valued ecosystem components. Section 1.7.2 describes the valued ecosystem components that will be the focus of the MCSR.

The park management planning process includes public input and review, strategic environmental assessment and Ministerial approval prior to being tabled in parliament. As a result of the intensive management planning and review process, issues related to the cumulative impacts of overall management of human use are addressed more appropriately within the scope of the management planning process including:

- Ø Appropriate use of park lands and facilities (e.g. Winter use of specific areas)
- Ø Management and maintenance of park facilities
- Ø Management of overall visitor use levels
- Ø Commercial business licence allocations or restrictions
- Ø Area closures, visitor use restrictions or zoning.

1.7.2. Valued Ecosystem Components

Valued Ecosystem Components (VECs) were selected based on issues of concern and ecological integrity indicators identified in the park management plans. The VECs selected represent ecosystem components that are particularly vulnerable to disturbance and/or are likely to be impacted by the activities covered by this MCSR. The selected VECs serve as the focus of the environmental effects analysis. Concerns with respect to air quality are considered to be primarily aesthetic and are addressed under the visitor experience VEC.

Wildlife

Grizzly Bears

Grizzlies are considered a “species of special concern” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and act as an umbrella species for many other wildlife species.

Wolves

Wolves are top-predators, and relatively low in population throughout the mountain parks making them vulnerable to ecosystem disturbances.

Wolverines

Wolverines are considered a “species of special concern” by COSEWIC and may be vulnerable to winter activities that may change predator-prey and competition processes affecting them. Wolverine are also subject to natal/maternal den abandonment in late winter and spring in response to human disturbance during wintering (Pers. Comm. Alan Dibb, July 2003).

Lynx

Like wolverine, lynx are vulnerable to activities in the winter that may change the predator-prey and competition processes affecting them.

Caribou

The Southern Mountain population of woodland caribou are considered “threatened” by COSEWIC and likely fewer than 10 animals remain within Banff National Park.

Other Wildlife

Other wildlife including birds such as raptors, waterfowl and songbirds, and small mammals may be considered sensitive on a site-specific basis.

Vegetation and Soils

Native Vegetation

Outdoor recreation activities may impact native vegetation. Vegetation in riparian areas, wet areas, and in the alpine where the growing season is short, is more vulnerable to the potential impacts of recreational use. Rare or endangered species found in the areas where guided activities occur may be inadvertently damaged or destroyed.

Non-Native Vegetation

Guides and clients could contribute to the introduction and spread of exotic plant species that may in turn affect the functioning of natural ecosystems and integrity of native plant communities.

Soil

Soil structure could be impacted through compaction or erosion.

Water Quality

The activities covered by the MCSR are land based and are not expected to have direct impacts on aquatic species. However, water quality could be impacted by pollution, human waste or erosion. Impacts to water quality may result in subsequent impacts to aquatic wildlife and vegetation species.

Cultural Resources

The *Act* requires consideration of the effects of changes to the environment on socio-economic conditions, and any archaeological or historical site of significance. Parks Canada policy states that “Parks Canada will assess effects on cultural resources whether

or not they flow from bio-physical effects” (Parks Canada 1998). To address both the requirements of the Act and of Parks Policy, direct impacts to cultural resources will be assessed in addition to indirect impacts caused as a result of changes in the environment.

Visitor Experience

As described in section 1.1.3, Parks Canada also has a mandate to facilitate the education and enjoyment of the parks by the public. To address this mandate, direct impacts to visitor experience will be assessed in addition to indirect impacts caused as a result of changes in the environment.

1.7.3. Identification of Potential Environmental Effects and Standard Mitigation Practices

The environmental impact analysis of land-based commercial guiding activities is based upon a three-tiered assessment approach organized into activity-specific, site-specific and cumulative effects analysis (Figure 3). The three-tiered environmental assessment approach is designed to address the requirements of the *Canadian Environmental Assessment Act*, and to be consistent with guidance provided by the *Canada National Parks Act, Parks Canada: Guiding Principles and Operational Policies* (Canadian Heritage Parks Canada 1994) and the mountain park management plans.

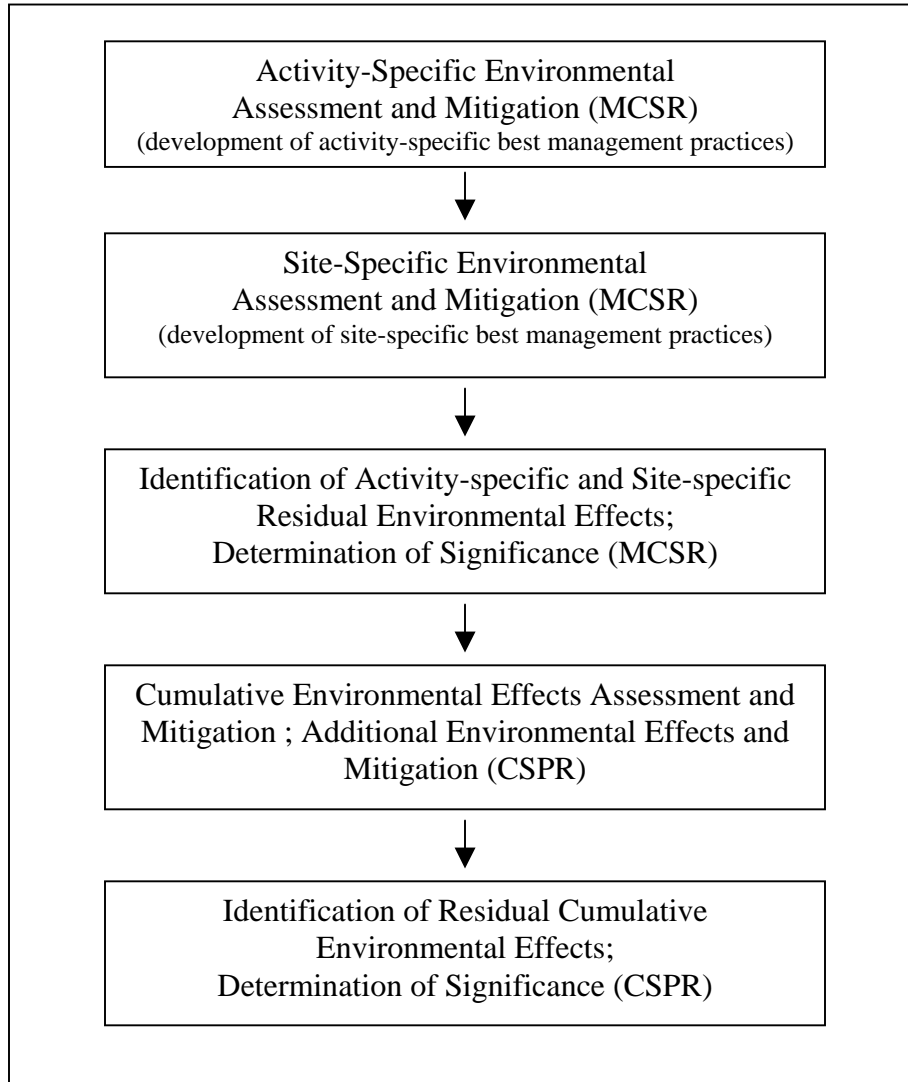
First, the *activity-specific* environmental assessment describes the project activities and evaluates the environmental impacts associated with each specific category of commercial guiding activity covered under the scope of the model class screening: guided trail use, mountain guiding, horse outfitting, winter activities and overnight use. Mitigation to address environmental impacts at this level of assessment focuses on the development of a set of standardized Best Management Practices (BMPs) for each activity. BMPs associated with each activity are researched, reviewed and selected for their application to a mountain park setting. Including BMPs as a condition of a business licence is intended to ensure that operators in the field implement appropriate environmental practices in a consistent fashion. The activity-specific environmental assessment and mitigation is completed within the scope of the MCSR.

Second, the *site-specific* environmental assessment identifies and evaluates environmental or culturally significant sites with unique characteristics that may be considered vulnerable to the impacts of commercial guiding activities. Special Preservation Zones and Environmentally Sensitive Sites as identified through park management plans, culturally sensitive sites, and other sites identified by Parks Canada are evaluated for environmental sensitivities and potential impacts that may not be effectively mitigated through the application of the standard BMPs. Site-specific mitigation for commercial operators using these areas is identified as appropriate. The site-specific environmental assessment and mitigation is completed within the scope of the MCSR.

Third, the *cumulative effects* assessment (CEA) describes and evaluates the impacts of land-based commercial guiding activities in combination with other past, present and future human use impacts. The approach to the CEA of commercial guiding activities

has been aligned with the approaches and direction taken to human use management in the various park management plans.

Figure 3: Environmental Assessment Process



The CEA identifies and evaluates areas that are considered to be vulnerable to overall human use impacts based on indicators of ecological integrity. Areas considered to be vulnerable to cumulative human use impacts are assessed using the Class Screening Project Report process. The CSPR also provides the opportunity to identify any additional activity-specific or site specific environmental effects that may not have been addressed within the scope of the MCSR.

1.7.4. Definition and Evaluation of Significant Environmental Effects

Responsible Authorities are required to make a decision on the significance of adverse environmental effects of a proposed project pursuant to Section 20 of the *Act*. A determination of the significance of effects is required for all VECs identified in Section 1.7.2.

Significant adverse environmental impacts to ecological integrity are considered to be those likely to threaten the continued existence of native species or biological communities. Adverse impacts to cultural resources are evaluated in terms of risk to the integrity and context of the site in consultation with Parks Canada cultural resources experts. Potential impacts to the use of cultural resources or impacts to related functions of other governments, communities or Aboriginal peoples will also be considered. (National Historic Sites Directorate et al. 1993). Adverse impacts to visitor experience are evaluated in terms of potential effects to visitor satisfaction.

The criteria of magnitude, geographic extent, duration, frequency, and reversibility will be used to evaluate the significance of environmental impacts. Significance is determined at the activity-specific and site-specific scale in the MCSR and again, with respect to additional and cumulative environmental effects, through the CSPR process.

Table 1: Criteria for determining significance

Criterion	Level of Effect		
	Negligible	Minor	Considerable
Magnitude	Effect results in disturbance	Effect results in damage	Effect results in destruction
Geographic Extent	Effect is limited to the activity footprint and adjacent areas	Effect is likely to have impacts at an ecosystem scale	Effect is likely to have impacts at a regional scale
Duration of Activity	Minutes to hours	Days to weeks	Months or longer
Frequency	Effects occur on a monthly basis or less	Effects occur on a weekly basis	Effects occur on a daily basis or more often
Reversibility	Effects are reversible over a short period of time without active management	Effects are reversible with active management over a short period of time; or if active management is not possible, effects are reversible over a season	Effects are reversible with active management over an extended period of time; or if active management is not possible, effects are permanent

2. Environmental Setting

Section 2 describes the environmental setting of the mountain National Parks within which land-based commercial guiding activities take place. The section discusses land use and management within the mountain National Parks and outlines the natural and cultural resources of these areas by VEC and by Park. To obtain information on species at risk, beyond what is outlined below, please consult the following:

- ☞ provincial conservation data centre (contact by email to receive map showing location of known species at risk)
e.g. British Columbia Conservation Data Centre <http://srmwww.gov.bc.ca/cdc/>
- ☞ Environment Canada
 - Species at Risk www.speciesatrisk.gc.ca
 - COSEWIC www.cosewic.gc.ca
 - SARA Registry www.sararegistry.gc.ca

2.1. Land Use and Management in the National Parks

An understanding of the land use and management system in the National Parks is fundamental to the analysis and evaluation of environmental impacts. The discussion on land use and management in the mountain National Parks is divided into discussions on

the National Park zoning system, the use of Land Management Units, and aboriginal land use.

2.1.1. National Park Zoning System

The national parks zoning system is an integrated approach to the classification of land and water areas in the national parks. Areas are classified according to the need to protect the ecosystem and the parks' cultural resources. The capability and suitability of areas in terms of providing visitor use opportunities is also a consideration in making decisions about zoning. The zoning system has five categories, which are described in *Parks Canada: Guiding Principles and Operational Policies* (Canadian Heritage Parks Canada 1994).

As the zoning system generally addresses the appropriate types and intensity of visitor use in a given area it is relevant and should be considered in the assessment and management of commercial guiding activities.

Zone I – Special Preservation

Zone I lands deserve special preservation because they contain unique, threatened, or endangered natural or cultural features and are excellent examples of representative natural regions.

Zone II – Wilderness

Zone II contains extensive areas that are good representations of a natural region and are conserved in a wilderness state. The perpetuation of ecosystems with minimal human interference is the key consideration. Zone II areas offer opportunities for visitors to experience, first hand, the park's ecosystems and require few, if any, rudimentary services and facilities. In much of Zone II, visitors have the opportunity to experience remoteness and solitude. Motorized access is not permitted.

Much of this land consists of steep mountain slopes, glaciers and lakes. Zone II areas cannot support high levels of visitor use. Facilities are restricted to trails, backcountry campgrounds, alpine huts, trail shelters and warden patrol cabins. Some wilderness sections of the parks will continue to have no facilities.

The *Canada National Parks Act* provides for the designation, by regulation, of wilderness areas of the park. A high level of ecological integrity is synonymous with wilderness. The intent of the wilderness declaration is to assist in ensuring a high level of ecological integrity by preventing activities likely to impair wilderness character. The perpetuation of ecosystems with minimal human interference is the key consideration in maintaining wilderness character. Only development and activities required for essential services and the protection of the park resources will be permitted in declared wilderness areas. Human use levels in declared wilderness areas will be managed based on landscape management unit objectives and human use strategies.

Zone III – Natural Environment

In Zone III areas, visitors experience the park's natural and cultural heritage through outdoor recreational activities that require minimal services and facilities of a rustic

nature. Zone III applies to areas where visitor use requires facilities that exceed the acceptable standards for Zone II. While motorized access may be allowed, it will be controlled. Public transit that facilitates heritage appreciation will be preferred. Access routes and land associated with backcountry commercial lodges are in Zone III.

Zone IV – Outdoor Recreation

Zone IV accommodates a broad range of opportunities for understanding, appreciation and enjoyment of the park's heritage. Direct access by motorized vehicles is permitted. Zone IV generally includes frontcountry facilities and the rights-of-way along park roads. Zone IV nodes also exist at various locations with intensive tourism and recreation facility development such as lodges, ski hills, campgrounds, visitor centers and day use areas.

Zone V – Park Services

These areas of intensive visitor use include the communities of Banff, Jasper, Lake Louise, Waterton, and Field as well as the transportation corridor through Mount Revelstoke and Glacier National Parks and the visitor facilities at Radium Hot Springs in Kootenay National Park.

Environmentally Sensitive Site or Area

The Environmentally Sensitive Site or Area (ESS, ESA) designation applies to areas with significant and sensitive features that require special protection.

2.1.2. Land Management Units in National Parks

Human use in the national parks has the potential to reduce habitat effectiveness for sensitive species of wildlife such as bears, wolverine, wolves and cougar. Construction and operation of roads, buildings or other facilities eliminates or compromises habitat. Even low levels of disturbance due to human recreation use may result in wildlife abandonment of an area and a reduction in effective habitat for sensitive species. Habitat effectiveness models are one of the tools Parks Canada uses to examine the impact of human use on sensitive wildlife species. Using computers, biologists overlay roads, trails, campgrounds, towns, and facilities on a map of vegetation and other landscape features. The resulting models help to determine the ability of a given area to support sensitive wildlife indicator species such as the grizzly bear.

To effectively evaluate the impact of human use on grizzly bear habitat effectiveness and on other ecosystem elements, each of the mountain parks has adopted the concept of the Landscape Management Units (LMUs). In the Rocky Mountain national parks the delineation of LMUs is based upon watershed units that approximate the home range size of a female adult grizzly bear. In Mount Revelstoke and Glacier the delineation of LMUs is based on ecological similarity and connectivity and the type and amount of human use and infrastructure. Management objectives and actions for each LMU in Mount Revelstoke and Glacier are outlined in the park management plans.

Banff, Jasper, Yoho, Kootenay and Waterton have established target thresholds for desired levels of habitat effectiveness in LMUs throughout each of the parks. LMUs were classified according to the potential habitat available for grizzly bears before

consideration of human use and development or disturbance. Habitat effectiveness is a comparison between the potential of an area to support grizzly bears and the value of the area as bear habitat, after accounting for human disturbance. Habitat effectiveness in several LMUs throughout the parks is currently below the desired target thresholds. In other words human use and development has already reduced the effective grizzly bear habitat to unacceptable levels.

The LMU habitat effectiveness analysis for the parks essentially identifies areas that are already under ecological stress from excessive human use and development. As such the habitat effectiveness analysis provides useful information related to the management of visitor use and should be considered in the assessment and management of commercial guiding activities.

2.1.3. Aboriginal Land Use in National Parks

A number of sites within the mountain parks are of particular interest to Aboriginal people. There is an unsettled 67 square kilometre land claim near Castle Mountain in Banff. Less than 100 commercially guided visitors currently use this area in a year. Also, access to pipestone quarries in Banff may be requested in the future. In Kootenay, the “Painted Pots” and “Kaufmann Lake” areas are of particular importance to the Ktunaxa tribe. The “Painted Pots” area has less than 40 commercially guided visitors each year. Aboriginal interest in precontact archaeological sites and burial sites in Banff, Jasper, Kootenay and Yoho may increase in the future. All other Aboriginal use of the mountain parks is similar to other visitors. Special requests for access or gathering of plants are considered on an individual basis.

Negotiations over the land claim and access to other sites are ongoing. In the event that commercial activities are impacted by treaty settlements the Class Screening may be amended to reflect any changes to the management of commercial activities through the amendment process outlined in Section 5 of this report.

2.2. Description of Natural and Cultural Resources

The description of natural and cultural resources in the mountain National Parks is arranged by VEC and further subdivided where appropriate by Park or Park grouping. The following VECs described are wildlife, soils and vegetation, water quality, cultural resources, and visitor experience.

2.2.1. Wildlife

The wildlife VEC is subdivided into a discussion of the specific wildlife species that are identified as indicators and those identified as being at risk in the mountain Park Management Plans. This approach focuses the EA on wildlife species that are of greatest concern and on the effects most likely to result in impacts to ecological integrity.

Grizzlies

Grizzly bears are particularly vulnerable to disturbance by humans because of their biological characteristics: low reproductive rate, large home range, limited capability of

dispersing females, and need for high quality forage in spring and fall (Kansas 2000). Outside the parks, habitat destruction is a concern; however, inside the parks habitat avoidance is the most important issue. Human caused disturbances including vehicles, trains, hikers, horses, campgrounds and other development all disturb grizzlies to some extent, result in habitat avoidance, and ultimately decrease the effectiveness and security of bears habitat (Kansas 2000). The nature, frequency and geographic extent of disturbances impact the extent of habitat avoidance (Kansas 2000).

Habitat effectiveness and core security areas for grizzlies have been measured using models and geographic information systems based on the assumption that measuring the habitat effectiveness for grizzlies will adequately address the habitat needs of other species. Habitat effectiveness was considered unacceptably low in Banff (Gibeau et al. 1996). Currently, of the 77 land management units (LMUs) in Waterton Lakes, Banff, Kootenay, Yoho and Jasper National Parks, 30 are not meeting their threshold for habitat effectiveness (Table 2). Security area goals (desired amount of secure area for grizzlies) have not been set for Kootenay, Yoho and Banff, so a value of 60% was chosen as a goal for this environmental assessment (Kansas 2000). In Jasper 5 of 33 LMUs are not reaching their security area goal.

Connectivity between patches of habitat is also important for the survival of the grizzly population. In the mountains, the topography limits the number of connections between habitat areas. Human caused impediments to movement include roads, railways, areas of high human activity, fences and removal of cover. Studies have clearly shown a reluctance by grizzlies to cross roads. For those who do attempt to cross the roads, some are killed. Railways do not seem to restrict movement, but some wildlife are killed crossing them every year. Areas of high human activity again are a discouragement for wildlife to enter into and cross. Fences clearly prevent movement of wildlife. Areas without adequate security cover will also be avoided by grizzly bears (Tremblay 2001).

Table 2. Number of Land Management Units (LMUs) not reaching grizzly habitat effectiveness and secure area goals.

Park	Number of LMUs	Number not reaching Habitat Effectiveness goal	Number not reaching Secure Area goal
Waterton Lakes (2000)	4	4	4
Jasper (2000)	33	7	5
Kootenay (2000)	7	2	1
Yoho (2000)	6	2	2
Banff (1997)	27	15	14
Total	77	30	26

Interactions with people can change animal behaviour and possibly lead to death of the animal. In Jasper, the total number of wildlife-human incidents in the backcountry involving both black bears and grizzly bears has ranged between 2 and 20 per year over

the past 10 years. Backcountry incidents represent 10% of the total park incidents with bears. Of the total incidents with bears, 11 involved human food, 2 garbage and 6 property. Since 1992, there have been an average of 6 incidents with grizzlies each year for the past 6 years (Dillon and Bradford 2001). In Yoho there were 2 incidents with grizzlies in the past 3 years in the backcountry. No incidents were recorded in Kootenay. In the Lake Louise area there were 6, 11, and 14 incidents reported involving grizzlies in 2000, 2001 and 2002 respectively. These incidents included closures, trappings, sightings and bears following people (Pers. Comm. Solange Poirier).

Human caused mortality of grizzlies in Banff increased over time until 1983, after which mortality decreased; however, the mortality rate in 1996 was still considered higher than acceptable for a national park (Gibeau et al. 1996). In Jasper, an average of 1 bear has died from human causes each year since 1992 (Dillon and Bradford 2001). Human caused mortality accounts for 70% of grizzly bear mortalities in Jasper over the past 10 years (Dillon and Bradford 2001). All of these occurred in high human use areas. Between 60-80 grizzlies have been estimated to live in Banff. Another estimate is of 200 grizzlies in Jasper, Banff, and Waterton Lakes National Parks (Gibeau et al. 1996). The small population, decreased habitat effectiveness, obstructions to movement and negative interactions with people make these bears vulnerable and considered a “species of special concern” by COSEWIC.

Lynx

Canada lynx populations in the southern Rocky Mountains are currently at low levels. Protecting movement corridors and critical habitat locations is important for their future. In Banff the Vermillion Pass area and middle Box Valley near Lake Louise appear to be relatively important habitat areas for lynx (Parks Canada 2003). Susceptibility to human disturbance may be most critical during denning (late May and June) potentially causing den abandonment and/or impacting kitten survival.

Seasonal movements of lynx to search for habitat or regional scale movements in search of mates are impeded by roads, railways, areas of high human activity, fences and removal of cover in similar ways to grizzlies (Apps 2000; Tremblay 2001).

In winter, lynx habitat effectiveness may be decreased by increased competition. Concern has been raised that wolves and coyotes moving on cross-country ski trails may introduce new competition in the winter for lynx or kill lynx directly (Tremblay 2001). Lynx focus on a few species of prey and competition for prey could be detrimental to individuals and the population. This is particularly a concern in winter when they have less energy reserves and when lynx and hares are at the lower end of their population cycle (Tremblay 2001). Areas of key winter lynx habitat have been identified around Lake Louise, Vermilion Pass, and western Yoho.

Wolverine

Wolverines are considered a species of “special concern” by COSEWIC. Wolverines have a low population density with a population estimate in Kootenay and Yoho of 8 females. Female wolverines are in dens from late winter to early spring at high elevations and may be particularly vulnerable to disturbances during that time.

Wolverines travel large distances and over many habitats and elevations, making habitat connectivity and cooperation with neighbouring land managers very important. Wolverines in the mountain parks avoid highways, with stronger avoidance in the first 100 m and a less strong avoidance between 900-1000 m from the highway (Austin 1998). Further research has indicated that wolverines cross less used roads.

In winter, predator-prey relationships may be altered by human trails. Wolverines will cross and use to their advantage human made trails such as ski trails, snowmobile trails and snowshoe trails (Austin 1998). However, wolverines may also become prey to competing large predators such as wolves if predators are able to access otherwise secure wolverine habitat on ski or snowshoe trails (Pers. Comm. Alan Dibb, December 2002). Wolverines may also have to compete with wolves for food. Many of the ecological and biological characteristics of wolverine are unknown, making it difficult determine the vulnerabilities of the population.

Wolves

Wolves are the most abundant and rapidly reproducing large carnivores in the Rocky Mountains, yet population densities are low. Approximately 51 wolf packs live throughout the Canadian Rocky Mountains Area including the parks covered by the MCSR. In the past, wolf control measures have virtually eliminated wolves from the Bow River Valley, but densities of wolves returned to pre-1950s status in the early 1990s. Wolves can be found in a wide variety of habitats, but are more likely to be found where there is prey (ungulates). In the mountain environment, physiography also influences wolf distribution. Low elevation montane valleys are considered primary habitat. These areas are also preferred areas for visitors. Human activity has decreased the amount of habitat and reduced the habitat effectiveness of some remaining habitat. Protecting wolf habitat is expected to protect the habitat for 96% of other species living in the same area (Paquet et al. 1996).

Wolves travel to new areas of habitat in search of prey or following the movements of prey. Similarly to grizzlies, wolf movements are limited by the topography and by various human activities and facilities (Tremblay 2001). Wolves have been found to avoid roads. Trails with few people on them were not avoided by wolves; however, when the number of people per month exceeded 100 there was an avoidance and complete alienation when more than 10000 people per month used the area. In summer, this meant that the percentage of habitat that was not considered effective for wolves was very high in Banff (Paquet et al. 1996).

In winter, highways have been shown to impede movement of wolves, but roads, and other trails were used for easier movement (Callaghan 2002). Energetic requirements for wolves in the winter are decreased by trails made through the snow. Wolves are attracted to roads and trails in winter because roads and trails are easier to travel on when the snow is deep (Callaghan 2002).

Caribou

The Southern Mountain population of woodland caribou are considered threatened by COSEWIC. The Jasper caribou population is small and declining and in Banff, the population of caribou has declined to a few animals (Pers. Comm. George Mercer,

December 2002, Pers. Comm. Alan Dibb, March 2003). Caribou do not breed until 3 or 4 years old and have a low reproductive rate (Environment Canada 2002).

Caribou, in small herds, seasonally move between their specific winter, spring, and summer habitats at various altitudes (Environment Canada 2002). Primary habitat for caribou in Jasper includes the Tonquin Valley and Maligne Valley (Mercer and Purves 2000). In Banff, primary habitat includes the upper Bow, Pipestone, Mosquito, Dolomite, Siffleur and possibly Clearwater drainages (Pers. Comm. Alan Dibb, March 2003). Human disturbance may result in an increase in energy expenditure and in displacement from habitat both of which are of considerable concern for the continued survival of woodland caribou populations. Human disturbance is more a concern in late winter when caribou are in poor condition and movement is more difficult. Factors increasing the stress of disturbance include: snow depth, leg length (i.e. calves), predictability of disturbance, and slope of terrain (Olliff et al. 1999). Late winter is calving season for caribou and a reduction in the number of viable offspring is a possibility if animals are repeatedly disturbed during their pregnancy.

Predation is considered a major limiting factor for caribou (Environment Canada 2002). In winter, human activity may increase the vulnerability of caribou to predators because predators can travel more easily on ski trails and access areas which previously would have relatively few predators (Callaghan 2002).

Recovery of woodland caribou populations in Banff Park is likely to occur only through direct, artificial augmentation of the population or through immigration of animals from the south Jasper - Whitegoat Wilderness area. Protection of potential habitat and movement corridors north of the North Saskatchewan River including Norman Creek - Sunset Pass, Nigel Creek to Nigel Pass, and likely the upper Brazeau River may be required to facilitate immigration of caribou from Jasper. (Pers. Comm. Alan Dibb, March 2003).

Other Species

The sensitive nature of grizzly bears means actions to protect their habitat and populations will benefit most other species (Kansas 2000). However, in the winter, grizzlies hibernate and species sensitive in the winter may require additional mitigation. In the mountain parks, managers are considering using the wolverine as an umbrella species for winter. Other wildlife species including breeding birds, waterfowl, ungulates (including mountain goat, bighorn sheep and elk), and other small mammals may be sensitive on a local scale. Locally sensitive species issues are identified in the descriptions of ecologically sensitive sites in subsections 2.2.2 (Soils and Vegetation) and 2.2.3 (Water Quality).

2.2.2. Soil and Vegetation

The discussion of biophysical characteristics is subjectively organized based on the contiguous land base, common administration and common environmental characteristics. In terms of ecological land classification the four contiguous mountain parks, Banff, Jasper, Yoho and Kootenay, will be discussed as one unit, Mount Revelstoke and Glacier as another and Waterton Lakes as an individual unit.

The review of environmentally sensitive areas of concern in relation to commercial guiding activities focuses on Zone I – Special Preservation lands and Environmentally Sensitive Sites as outlined in the various park management plans (Parks Canada 1997a; Parks Canada 2000a; Parks Canada 2000b; Parks Canada 2000c; Parks Canada 2000d; Parks Canada 2002d). Other sensitive or vulnerable sites were identified in consultation with Park staff and stakeholders and through Geographic Information System (GIS) analysis.

2.2.2.1. Banff, Jasper, Yoho, Kootenay – Ecological Land Classification

Detailed biophysical land classification studies for each of the four contiguous mountain parks complete with ecosite descriptions and information on landform, soils, vegetation and wildlife have been documented (Achuff et al. 1984a; Achuff et al. 1986; Achuff et al. 1996; Holland and Coen 1982; Poll et al. 1984). Three major ecoregions are recognized for the four mountain parks; Montane, Subalpine – divided into the Lower Subalpine and Upper Subalpine, and Alpine.

The climate of the *Montane Ecoregion* is generally the warmest and driest in the four mountain parks. The Montane in Banff, Jasper and Kootenay may be characterized as warm and dry while the Montane in Yoho is more aptly characterized as warm and wet. Although the Montane is generally the warmest ecoregion it probably has the greatest temperature fluctuation. Winds in the Montane are slightly stronger and more frequent than in other areas. Warm winter winds from Pacific air masses raise winter temperatures and the Montane is intermittently snow-free.

The Montane Ecoregion is predominantly forested and mature vegetation is typically characterized by douglas fir *Pseudotsuga menziesii*, white spruce *Picea glauca*, and trembling aspen *Populus tremuloides*. Stands of lodgepole pine *Pinus contorta* are usually successional but may form climax forest in drier areas. On the driest montane sites, grasslands form the mature vegetation. Fire appears to be important in maintaining montane grasslands and return to climax condition following fire may take as little as ten years. White spruce-subalpine fir *Abies lasiocarpa* forest types occur on wetter sites in the montane in Yoho. The douglas fir-ponderosa pine *Pinus ponderosa* vegetation type occurs in the Stoddart Creek area of Kootenay and is unique to the mountain parks.

Montane forests and grasslands in each of the mountain parks are critical to wildlife especially during fall, winter and spring. Many animals, especially ungulates and associated large carnivores, move to montane areas during the winter due to the shallower snowpack. Montane wetlands are particularly important for communities of birds, amphibians and mammals that are unique to each of the mountain parks.

The Montane Ecoregion in each of the mountain parks is also the area most extensively used and developed by humans. The Towns of Banff and Jasper, the Trans Canada and Yellowhead highways, the major railways, utility rights-of-way, and tourism developments at Radium Hotsprings and Emerald Lake all fall within the limited extent of the Montane Ecoregion in the mountain parks. Human activity in the Montane has the potential to result in the reduction of usable wildlife habitat as a result of wildlife

displacement, seasonal disturbance of wildlife during critical periods, and the destruction of unique or rare wildlife habitat sites. An important consideration in terms of potential impacts to critical wildlife habitat is that the Montane Ecoregion makes up a relatively small proportion of the park landscape.

The *Subalpine Ecoregion* is very extensive and dominates most of the landscape in each of the mountain parks. Precipitation is higher and temperatures cooler in the Subalpine than in the Montane. Winter snow accumulation is higher and lasts longer than snow in the Montane. Subalpine wetlands are less productive than those of the Montane, remaining frozen longer.

Closed coniferous forests characterize the *Lower Subalpine Ecoregion*. Mature forest is dominated by Engelmann spruce *Picea engelmannii* and subalpine fir in Banff, Jasper and Yoho. Engelmann spruce and white spruce dominate the Lower Subalpine in Kootenay. Seral lodgepole pine forests are common at lower altitudes. Lower subalpine forests and wetlands are important for a wide variety of wildlife including mammals, birds and amphibians.

The *Upper Subalpine Ecoregion* is a transitional area between the closed canopied Lower Subalpine and the treeless Alpine tundra. The Upper Subalpine is characterized by open-canopied forests of Engelmann spruce and subalpine fir and locally of subalpine larch *Larix lyellii* or whitebark pine *Pinus albicaulis*. The timberline is the upper limit of this ecoregion. Snow accumulation is heavy and winters are too severe for ungulates except on steep, exposed, wind blown slopes. Because of its heavy precipitation however, the Upper Subalpine offers lush, productive summer habitat for many species of wildlife. Mountain Goat, Grizzly Bear, Wolverine and White-tailed Ptarmigan are species of concern that frequent and rely on the open forests and meadows of the Upper Subalpine.

Extensive areas of the Upper Subalpine Ecoregion exist in Banff and Jasper. In Kootenay and Yoho the Upper Subalpine zone is relatively restricted in scope although they also tend to be some of the most scenic and popular areas for backcountry recreation activities.

The *Alpine Ecoregion* is the highest and coldest ecoregion of the parks. The Alpine receives heavier precipitation than any of the other ecoregions but much precipitation in the form of snow is deposited at lower elevations. Cold winters, cool summers and high winds prevent tree growth. Rather than a dominant vegetation pattern, a mosaic of low shrub and herb communities characterizes Alpine vegetation. Vegetation is influenced by microclimatic conditions including wind exposure, time of snow melt, soils moisture and snow depth. Succession in the Alpine is very slow and recovery to vegetation after damage such as trampling may take hundreds of years.

Like the montane, the Alpine Ecoregion occupies a small proportion of the landscape in the mountain parks. Like the Subalpine, Alpine regions are very scenic and popular for backcountry recreation although many areas are not accessed by established trails.

A considerable proportion of the park landscape does not fall within one of the three primary ecoregions but are described as *Miscellaneous Landscapes*. Miscellaneous

Landscapes include landslides, rubble, rockland, recent moraines and stream channels, glaciers, talus and waterbodies. Miscellaneous Landscapes occupy sites within and adjacent to ecoregion sites and may be colonized by local vegetation.

Non-native species of plants can be harmful to native ecosystems when they spread and replace native species. Often these species spread rapidly because they have no natural diseases or predators making it difficult to eliminate them after they begin spreading. In Banff there are 77 non-native species and in Kootenay/Yoho there are 68 non-native species (Parks Canada 2001) (DeLong and Pengelly 2002). Non-native species have spread into the park through a variety of methods including: ornamental gardens, horse feed, and unintentional transportation of seeds. Non-native horse feed species are particularly common around the trailheads used by horses and they diminish as the trails increase in elevation. Information on the current rate of spread by each method is not available. This information is difficult to determine because non-native species that were brought in by horses and horse feed in the past are sometimes in similar locations to current horse use (Pers. Comm. Rob Walker).

2.2.2.2. Banff, Jasper, Yoho, Kootenay Ecologically Sensitive Areas

This section of the report discusses designated and other ecologically sensitive sites that are unique to each park.

Banff - Designated Ecologically Sensitive Sites

Clearwater-Siffleur Zone I Area

The Clearwater-Siffleur Area contains the range of the southernmost woodland caribou herd in Alberta and a number of physiographic and biotic resources that are rare in the park including: hoodoos; permafrost; rare plant and animal species; Aboriginal cultural sites; elk and bighorn sheep; as well as wolf and grizzly bear habitat.

Castleguard Cave and Meadows Zone I Area

The Castleguard Cave System is a karst system internationally recognized for its physical development, diversity of features, and rare and unique fauna. With a length of approximately 20 km, it is the longest cave in Canada and one of the deepest. The cave system contains a notable variety of special features including stalagmites and stalactites, precipitates of gypsum, hydromagnesite and rare cave minerals. The Castleguard Meadows area serves as an outstanding example of pristine alpine vegetation.

Cave and Basin Marsh Zone I Area

The Cave and Basin area has been designated as a national historic site in recognition of its historic significance as the birthplace of Canada's national park system. The warm water of the Cave and Basin Marsh supports a number of invertebrates and provides a unique habitat for reptiles and amphibians. The area is the most important habitat for snakes in the park and in combination with the Vermilion Wetlands constitutes the most productive bird habitat in the lower Bow Valley.

Middle Springs ESS

The upper and lower Middle Springs remain the only relatively undisturbed hot springs on Sulphur Mountain. The warm mineral waters create a unique habitat for rare plants and invertebrates including the endangered Banff Springs Snail.

Fairholme-Carrot Creek Benchlands ESS

The Fairholme Ranger area from the East Gate to Johnson Lake is the largest remaining intact block of secure montane wildlife habitat in the park. Human use of this area, particularly during the summer, can restrict wildlife movement and habitat use. Off-road bicycling is not permitted in this area, voluntary restrictions on human use are encouraged, and trails are not maintained.

Banff - Other Recognized Sensitive Areas and Components

Other sensitive sites have been identified in: park management plans; special resources studies; and by Parks Canada scientists and field staff. Johnson Lake, Skoki, Middle Spray and Lake Minnewanka are identified in the Banff Park Management Plan (Parks Canada 1997a) as high priority for management. Achuff et al. (Achuff et al. 1986) in their assessment of special park resources identified a number of natural areas of significance and stated their degree of threat. Natural areas of significance under high threat (at or near where guided hiking takes place) include Johnston Canyon, Lake Louise, Mount Norquay, Parker Ridge, Sawback Range, Sunshine Meadows, and Tunnel Mountain.

The draft document titled "Human Use Strategy for Banff National Park" identifies key areas for grizzly bear and other wildlife habitat including the Clearwater/Siffleur, Flints Park, Bryant Creek and Skoki areas. Other sites of potential concern identified by Park staff include, Paradise and Moraine Lake Valleys, and the Pipestone/Upper Bow LMUs including specific concerns in the Helen Lake/Dolomite Pass, and the North Molar pass areas.

Another sensitive area is the Cascade Wildlife Corridor between Cascade Mountain and the Trans-Canada Highway. Facilities such as access roads, an airstrip, and the Timberline Lodge limit the movement of wildlife between the Vermilion Lakes and the Cascade Valley. Other low elevation passes in Banff have also been identified as important movement corridors for wildlife including Vermillion, Howse, Kicking Horse and Thompson Passes. Sunset and Nigel Passes have been identified as important movement corridors between northern Banff and the adjacent White Goat Wilderness and Jasper respectively.

Jasper - Designated Ecologically Sensitive Sites

Ancient Forest Zone I Area

The oldest living specimens of Engelmann spruce (*Picea engelmannii*) in the Canadian Rocky Mountains, and possibly North America, have been identified at a subalpine site approximately one kilometre west of the Columbia Icefield Center. The site is near the upper limit of tree growth and is flanked by moraine and the outwash of the Sunwapta River. The trees range in age from approximately 703 to 763 years. These trees are an excellent example of climax succession. The park will not encourage access to the area and will interpret resources off-site.

Surprise Valley Zone I Area

The Surprise Valley is part of the Maligne karst system. The valley, located above the Maligne River, is drained entirely underground through limestone of the Upper Devonian Palliser Formation. It is associated with one of the largest underground river systems in North America. The valley contains sink points into rock avalanche deposits, pavement karst, sink lakes, and some of the finest examples of rillenkarrren in North America. The Surprise Valley is designated as a Zone I area because of these significant surface karst features. No new access will be provided to the area.

Edith Cavell Meadows ESS

The upper subalpine and alpine meadows near Mount Edith Cavell contain many significant plant species. With one exception, all these species are located elsewhere in the park. However, the existence of such an array of unusual plants indicates environmental circumstances not found elsewhere in the four mountain parks. The meadows are also an important caribou calving and rutting area. Use of the meadows has increased over the last several years and action is required to protect rare plant communities and provide for the needs of caribou.

Jasper - Other Recognized Sensitive Areas and Components

Tonquin Valley Area

For the purposes of this environmental assessment, the Tonquin Valley Area includes the Amethyst Lakes, Tonquin, Moat and Vista Passes, and Maccarib Pass and Creek. The Tonquin Valley is recognized as an important habitat and movement corridor for grizzly bears. The areas also serve as caribou, lynx and wolverine habitat. Caribou may be sensitive to human disturbance during rutting and calving seasons. Lynx and wolverine may be more sensitive to disturbance during the winter season.

Montane Ecoregion

Representing only 7% of the total area of Jasper, the montane ecoregion is important to wildlife and people. The montane provides critical wildlife habitat for both ungulates and large carnivores as well as the greatest level of biodiversity in the park. Warmer, drier winters and a light snowpack offer some relief from harsh winter conditions at higher elevations. The lower slopes and large valley bottoms provide important wildlife corridors especially during the fall, winter and spring. Visitor facilities such as towns, roads, railways, utility corridors, campgrounds and outlying commercial accommodations are also concentrated in the montane.

Three Valley Confluence

The Three Valley Confluence (TVC) is an area of specific management interest to Jasper. The TVC supports important montane ecosites in close proximity to large riverine systems, and serves as an important, low elevation movement and dispersal corridor for a large number of wildlife species. It also contains major concentrations of human use including the Town of Jasper, Highway 16, CN main line and outlying commercial accommodations.

Wilcox Pass

Wilcox Pass is located immediately east of the highway across from the extremely popular Columbia Icefields/Athabasca Glacier area. The Wilcox Pass trail offers relatively easy access to sprawling alpine meadows, small ponds, and spectacular views of the peaks and glaciers of the Columbia Icefields. Once arriving at the meadows many hikers leave the main trail and disperse throughout the valley and shallow pass seeking solitude and unobstructed views. Information on the level of commercial use at Wilcox Pass is uncertain although it is generally agreed that overall use levels are increasing.

Opal Hills/Bald Hills

The Opal Hills and Bald Hills trails are very popular day hiking destinations just to the north of Maligne Lake. Both trails ascend through forested slopes and culminate on subalpine or alpine ridge tops with expansive views. As with Wilcox Pass many hikers leave the main trail near the summits seeking solitude and unobstructed views. Being very pleasant locations, hikers are prone to linger at the trail summits and viewpoints. Development of informal trails, damage to vegetation and improper disposal of human waste are a result of the relatively heavy use at these sites.

Yoho - Designated Ecologically Sensitive Sites

Burgess Shale Zone I Area

The exquisitely preserved fossils of soft-bodied organisms found in the Burgess Shale level of the Stephen Formation are one of the most significant fossil discoveries in the world. Fossil beds in Yoho will be managed as Zone I - Special Protection areas in recognition of their international significance. Zone I will be extended to include significant fossil outcrops on the Cathedral Escarpment.

Ice River Igneous Complex Zone I Area

The exposed rock strata of Banff, Jasper, Kootenay and Yoho are almost entirely sedimentary and metamorphic in nature. The only significant exception to this is the Ice River Igneous Complex, which occurs primarily along the Ice River in Yoho. This complex is the largest and best-known intrusive body in the Canadian Rocky Mountains. It forms an S shape 18 km long with an area of 29 km². It consists almost entirely of alkaline rocks including sodalite and nepheline syenite. It is also the source of edingtonite and natrolite crystals of exceptional quality.

Emerald Lake Vegetation ESS

The Emerald Lake area contains vegetation unique to the four mountain parks. Vegetation associations that include western hemlock, western white pine, western yew and grand fir are found here. Western yew, meadow sedge, bronze sedge and heart-leaved twayblade are species not found elsewhere in the park.

Yoho - Other Recognized Sensitive Areas and Components

The study of special features of Yoho, McCallum et al. cited a number of sites in the three LMUs below 80% habitat effectiveness such as Emerald Lake, Lake O'Hara, and the McArthur Valley (McCallum et al. 1995). No level of threat was assigned to the areas. Other sensitive areas include the Amiskwi, Kicking Horse, O'Hara/Ottertail, and the McArthur Valley-Cataract Brook wildlife movement corridors.

Otterhead River/Porcupine Creek /Amiskwi River Valleys

The Otterhead River and Porcupine Creek Valleys lie within the montane Ecoregion of Yoho National Park and receive relatively low use. Given the limited extent of montane in the park these valleys are particularly important to wintering wildlife. Along with the Otterhead and Porcupine, the Amiskwi Valley supports high levels of use by grizzly bears, particularly reproducing females. These valleys are also important habitat for elk, moose, and wolves, and potentially important for wolverine.

Kootenay - Designated Ecologically Sensitive Sites

Burgess Shale Outcrops Zone I Area

The exquisitely preserved fossils of soft-bodied organisms, found in the Burgess Shale level of the Stephen Formation, are one of the most significant fossil discoveries in the world. The Stephen Formation is mostly contained in Yoho but extends into Kootenay along its northeast boundary. Fossil locations in Kootenay will be managed as Zone I - Special Protection areas in recognition of their international significance.

Ice River Igneous Complex Zone I Area

The exposed rock strata of Banff, Jasper, Kootenay and Yoho are almost entirely sedimentary and metamorphic in nature. The only significant exception to this is the Ice River Igneous Complex, which has a small exposure near Mt. Sharp in Kootenay. The Ice River Igneous Complex consists almost entirely of alkaline rocks including sodalite and nepheline syenite. It is also the source of edingtonite and natrolite crystals of exceptional quality.

Mt. Wardle and Mt. Verendrye Zone I Area

The Mt. Wardle and Mt. Verendrye area contains the summer and winter range of the largest mountain goat population in the park. Mt. Wardle is the only area in the four mountain parks where mountain goats winter at montane elevations. The area also contains important grizzly bear and cougar habitats, as well as representative elements of virtually all the ecological zones that occur in the park. The area is relatively inaccessible and has no man-made trails or other facilities.

Dry Gulch - Stoddart Creek Zone I Area

This area of southwestern Kootenay represents the western ranges and eastern Rocky Mountain Trench. The climate is warmer and drier than elsewhere in the four parks, resulting in vegetation associations typical of areas to the south. This is the only area in the Canadian national parks system where the dry Douglas fir-ponderosa pine-wheatgrass vegetation type occurs. The occurrence of ponderosa pine is the most northerly representation in the Columbia Valley. A number of other plant species are restricted to this area including prickly-pear cactus. The area contains major winter and summer ranges for bighorn sheep, mountain goat, and mule deer, and is also important to cougar.

Sora and Sundew Pond ESS above Kootenay Crossing

These ponds support rare plants and serve as important waterfowl breeding and amphibian habitat.

Wolverine Pass ESS

Wolverine Pass is the only pass through the Vermilion Range and serves as an important wildlife corridor connecting to Dainard Creek and Moose Creek on provincial lands. The pass is also significant habitat for large carnivores and goats and is one of the largest alpine meadows in the park. Tumbling Creek Valley, one of the main wildlife corridor routes connecting the upper Kootenay River Valley to the Vermillion River Valley is also one of the most popular hiking routes into the spectacular Kootenay Rockwall.

Moonwort ESS

Moonwort, a rare plant listed as a species of special concern by the British Columbia Conservation Data Centre is found at this location. The ESS, near Marble Canyon, is a very small site (less than one square kilometre).

Radium Hot Springs ESS

The Radium Hot Springs feature unique geology, fauna and flora within a very small site (less than one square kilometre).

Wardle Flats ESS

Wardle Flats is a significant area for wildlife including wolf, grizzly bear, and black bear.

Kootenay - Other Recognized Sensitive Areas and Components

Kindersley Summit

The Kindersley Summit area is the only alpine area accessed by trail in the south end of Kootenay National Park and serves as important lambing and summer habitat for bighorn sheep. This area also sees high use by grizzly bears. The trail is seeing increasing numbers of users.

Kootenay River Valley Bottom

The Kootenay River valley bottom near the south end of the park is an important montane Ecoregion supporting whitetail deer, mule deer, elk, moose and wolves as well as other wildlife species.

No other sensitive sites were identified for Kootenay National Park.

2.2.2.3. Waterton Lakes – Ecological Land Classification

Waterton Lakes is a biodiversity hotspot in Alberta and in Canada. The interface between the Plains and Cordillera and the juxtaposition of the Aspen Parkland and Rocky Mountain Natural Regions has led to the development of some interesting wildlife assemblages. Overall, there is a high diversity and density of vegetation and wildlife species (Wallis and Wershler 1997).

The *Foothills Parkland Ecoregion* is characterized by a landscape pattern of rough fescue (*Festuca scabrella*) grassland and aspen (*Populus tremuloides*) grove forest. Foothills Parkland occurs in a limited geographic area in Canada and the USA, occupying a narrow band along the eastern edge of the foothills from Calgary south to the Porcupine Hills, and from Pincher Creek south to the US border, including portions of Waterton Lakes.

Waterton Lakes is the only Canadian national park that contains a portion of the Foothills Parkland Ecoregion.

At lower elevations, there are extensive grasslands that support declining populations of sharp-tailed grouse, a species that is vulnerable to disturbance on its dancing grounds. Fire and grazing each play an important role in the maintenance of the biodiversity of many grassland ecosystems. Conservation of diverse bird populations will require maintaining a mosaic of upland habitats that are subject to grazing and fire. It should be noted that lightly grazed grasslands are relatively rare in Alberta and every effort should be made to maintain their excellent condition.

The *Montane Ecoregion* is characterized by both open and closed coniferous forests dominated by *Pseudotsuga menziesii* (douglas fir) and *Pinus flexilis* (limber pine). Aspen forests (C60, C61) also occur sparingly in the Montane Ecoregion but seldom in the parkland landscape pattern of the Foothills Parkland Ecoregion. Black cottonwood forests (C76) occur on wet fluvial sites along rivers and creeks. Grasslands occur on dry, exposed sites.

The Foothills Parkland and Montane are the two most productive ecoregions for birds in the park with the Montane Ecoregion also being a highly productive area for small mammals. Highly productive stream valleys with wetland and riparian woodland ecosystem complexes characterize both ecoregions. Wetlands in these ecoregions are especially important for amphibians and water birds and overall contain the greatest diversity and highest densities of wildlife in the park. Like the montane regions in the other Rocky Mountain National Parks, the Foothills Parkland and Montane also have the highest concentration of development and human use.

With respect to vegetation types, the Subalpine and Alpine Ecoregions in Waterton Lakes are very similar in nature to the matching Ecoregions of the other mountain parks. The Lower Subalpine is a highly productive area for small mammals. The Upper Subalpine and Alpine have the lowest productivity in terms of wildlife but feature several restricted range species including the water vole, white-tailed ptarmigan, timberline chipmunk, gray-crowned rosy finch, and American pipit.

Extensive and productive Upper Subalpine and Alpine forest and meadow complexes are relatively restricted in Waterton Lakes. They also tend to be some of the most scenic and favoured backcountry recreation areas. Species of particular concern include water vole and white-tailed ptarmigan. The white-tailed ptarmigan exhibits a behaviour that may make it more prone to predation since it readily allows humans to approach and observe it at close range.

2.2.2.4. Waterton – Ecologically Sensitive Areas

Waterton - Designated Ecologically Sensitive Sites

Festuca/Danthonia Grasslands ESS

Commonly known as bunchgrass prairie, the Foothills Parkland Ecoregion is a narrow band of prairie that stretches along the plains and foothills from southern Alberta into

Montana. The *Fescue scabrella/Danthopia parryi* grass association typifies the region. Waterton contains the only example of this particular foothills bunchgrass association protected in the Canadian national park system. Fescue grasslands provide critical winter range for the park's elk herds and important spring range for mule deer and bighorn sheep. It is also key habitat for several typical prairie species such as badgers, sharp-tailed grouse and Richardson ground squirrels.

Waterton - Other Ecologically Sensitive Sites and Components

Nine areas of special ecological significance, identified in the Ecological Land Classification for Waterton Lakes National Park (Achuff et al. 2002) are listed below.

Forest Areas:

- €# riparian cottonwood along the Waterton River on Blakiston Fan, around the Maskinonge and in the vicinity of the beaver ponds along the Red Rock Canyon road
- €# woodlands adjacent wetlands in the Sofa Wetlands complex and the woodlands south of the Belly River Campground
- €# moister coniferous woodlands along the Continental Divide in the vicinity of the Akamina Pass and Cameron and Summit Lakes

Open Habitats:

- €# Grassland Complex from Buffalo Paddock to Blakiston Beaver Ponds, including eastern slope of Bellevue Hill/Mt. Galwey
- €# Summit Lake-Carthew Lakes (Upper Subalpine and Alpine)
- €# Lone Lake-Blue Grouse Basin (Upper Subalpine and Alpine)
- €# Lineham Lake (Upper Subalpine and Alpine)

2.2.2.5. Mount Revelstoke-Glacier – Ecological Land Classification

Detailed biophysical land classification studies for Mount Revelstoke and Glacier, complete with ecosite descriptions and information on landform, soils, vegetation and wildlife, have been documented (Achuff et al. 1984b; Van Tighem and Gyung 1984). Three Ecoregions are recognized in Mount Revelstoke and Glacier; Interior Cedar-Hemlock; Englemann Spruce-Subalpine Fir, and; Alpine.

The Interior Cedar-Hemlock Ecoregion (ICH) is characterized by vegetation dominated by western hemlock *Tsuga heterophylla* and western red cedar *Thuja plicata*. The ICH occupies the lowest elevations in the parks and, like the Montane Ecoregion in the Rockies, is the warmest and driest of the park ecoregions. The ICH is however much wetter than the Montane and is rarely snow free in the winter. Snowfall accounts for up to 70% of total precipitation in the ICH.

The lower valleys of the Beaver and Illecillewaet Rivers and Mountain Creek in the ICH support wetland communities of birds, amphibians and mammals that are unique in the

parks. Many of the wetlands are maintained in their productive state by beaver. These sites and others in the ICH are rated as highly important to ungulates, carnivores, small mammals and birds.

As with the Montane Ecoregion, the ICH is also an area of concentrated human use and development in both parks. The Trans Canada Highway and CPR rail lines run through the valley bottoms. While not approaching the magnitude of tourism development in the Montane Ecoregion of the Rocky Mountain national parks, the ICH is the focus of most tourism developments including the major campgrounds, day use areas and tourist facilities at Rogers Pass.

Closed forests dominated by Engelmann spruce and subalpine fir characterizes the Lower Engelmann Spruce – Subalpine Fir Ecoregion. Mountain hemlock *Tsuga mertensiana* is often co-dominant and western hemlock occurs at lower elevations. The *Upper Engelmann Spruce – Subalpine Fir Ecoregion* typically has open forests dominated by Englemann spruce and subalpine fir. Mountain hemlock is common, often as a co-dominant. The Lower and Upper Ecoregions are referred to together as the *Subalpine*.

Open upper subalpine slopes of the western half of Mount Revelstoke are used by mountain caribou in late winter. Avalanche meadows in the subalpine are used extensively by black and grizzly bears and various subalpine locations in the parks are used by mountain goat communities throughout the year.

Human development and use including tourism and recreation activities take place in subalpine regions notably around Rogers Pass and at the summit of Mount Revelstoke. Most backcountry hiking trails in the parks lead to or through subalpine regions and backcountry skiing and snowboarding are very popular winter activities taking place in the subalpine around Rogers Pass. Human activities that affect wildlife in the subalpine include direct mortality along transportation corridors and disturbance caused by backcountry recreation activities most notably human/bear conflicts and disturbance of caribou during sensitive times in late winter.

The *Alpine Ecoregion* in Mount Revelstoke and Glacier is similar in nature to the alpine regions further east in the Rocky Mountain national parks. Succession in the Alpine is very slow and recovery to vegetation after damage such as trampling may take hundreds of years.

Miscellaneous Landscapes in Mount Revelstoke and Glacier include colluvial rubble, rockland, recent moraines, rock glaciers, glaciers, talus and waterbodies. Miscellaneous landscapes occupy sites within and adjacent to ecoregion sites and may be colonized by local vegetation where conditions permit.

Mount Revelstoke-Glacier Designated Ecologically Sensitive Sites

Nakimu Caves-Cougar Valley Zone I Area

The Nakimu Caves in the Cougar Valley have significant karst features and are a premier grizzly bear habitat. The caves include over 5km of passages, the second longest cave in the National Park System. The caves are closed to general public use to reduce both

public safety concerns and human caused disturbance. Access is controlled through a permit system.

Cascade Caves and Bridge ESS

Similar to the Nakimu Caves, the Cascade Caves area boasts unique karst formations and the surrounding area is used extensively as grizzly bear habitat. The Cascade Creek Bridge (410T15) is a culturally significant single-arched span bridge along the CPR abandoned 1885 rail grade. Chemical weathering, stream erosion and heavy vegetation growth threaten the structure. It is also easily accessible from the Trans-Canada Highway and its deterioration makes it a public safety concern.

Riparian Old Growth Forest ESAs

Riparian old growth forests along the transportation corridor valley bottoms contain or support rare or endangered species and contribute to the viability of wildlife movement corridors.

Mount Revelstoke-Glacier Other Ecologically Sensitive Sites and Components

No other ecologically sensitive areas or components have been identified.

2.2.3. Water Quality

Rivers in the mountain parks are the most significant aquatic resource and flow into river systems that flow across a vast area. Many upper streams have steep gradients and large fluctuations in flow in response to storms and glacier melt. Lakes are also found throughout the parks, though they are often small (Schindler and Pacas 1996).

Aquatic ecosystems in the mountain parks have been altered in a number of ways over the past 150 years. Dams, reservoirs and other structures have altered the flows of rivers, damaged wetlands and changed the size and shapes of lakes. Fisheries management has included the introduction of non-native species into many waterbodies and alterations to native fish populations. Chemical inputs from various sources have also altered the aquatic environment in some waterbodies.

This section further describes the water quality VEC by discussing sensitive aquatic ecological sites and components in each park that may be affected by commercial guiding activities.

2.2.3.1. Banff Designated Aquatic Ecologically Sensitive Sites

Vermilion Lakes Wetlands ESS

The Vermilion Lakes Wetlands support a diversity of vegetation including many rare and significant plant species. The area serves as an important wildlife habitat and wildlife movement area and contains many special features: lakes, ponds, springs, rare birds, moose winter range, elk calving areas and ungulate mineral licks. The alluvial landforms on the north and east shores of the lakes and adjacent wetlands are also rich in significant archaeological resources from at least 10,700 years ago.

2.2.3.2. Jasper Designated Aquatic Ecologically Sensitive Sites

Pocahontas Ponds ESS

The wetlands of the Athabasca floodplain near Pocahontas are known locally as the Pocahontas Ponds. This area of small ponds and active and dead stream channels is very important to wildlife. The area provides critical winter range for elk and moose and is also important to small mammals. Carnivores are attracted by these prey species. Numerous bird species occur in high densities, many of which are not found elsewhere in the parks. Raptors such as osprey and bald eagle nest here. The area also provides habitat for the river otter, a rare species in the park. Any major construction in the area (e.g., roads) will change sedimentation and erosional patterns. Care must be taken that future development and use do not have a negative impact on the area's special resources.

Maligne Lake Outlet ESS

The Maligne Lake outlet is a "club site", or area of high concentration for harlequin ducks particularly during the pre-nesting period. Similar concentrations are rare in North America. Harlequin ducks require special management due to their sensitivity to in-stream disturbance, narrow ecological requirements and low reproductive potential. The outlet is part of the mid-Maligne River, a movement corridor between Maligne and Medicine lakes for harlequin duck broods.

2.2.3.3. Yoho Designated Aquatic Ecologically Sensitive Sites

Ottertail Flats, Leanchoil Marsh and Wapta Marsh ESSs

These three areas are important wetlands. Montane wetlands are rare in Yoho and in the mountain parks in general. These areas support a diversity of species and include nesting areas for bald eagle and osprey and important winter habitat for ungulates.

Sherbrooke Lake

Sherbrooke Lake and Valley are considered to be important Grizzly bear and Wolverine habitat. The Sherbrooke Valley is one of the primary descent routes in the winter from the Wapta Icefields ski traverse.

Hamilton Lake

Hamilton Lake is a popular day hike leading from the Emerald Lake parking lot. Increasing winter use in this area, especially from snowshoeing activities, may subject lynx and wolverine populations to undue stress.

2.2.3.4. Kootenay Designated Aquatic Ecologically Sensitive Sites

No aquatic sensitive sites were identified for Kootenay National Park.

2.2.3.5. Waterton Designated Aquatic Ecologically Sensitive Sites

The Maskinonge Wetlands Zone I Area

As one of the few remaining natural wetlands in southwestern Alberta, this area is a key waterfowl staging and nesting area. Several rare, endangered or threatened bird species, such as trumpeter swans, bald eagles and red-necked grebes frequent the area. Several archaeological sites are in this zone, but no commercial guided activity occurs near them.

Aquatic areas of special ecological significance, identified in the Ecological Land Classification for Waterton Lakes National Park (Achuff et al. 2002) are listed below.

- ☞ Upper Crooked Creek (Sofa) wetlands
- ☞ lower Blakiston Creek wetlands
- ☞ North Fork Belly River
- ☞ Blakiston/Bauerman Creek

2.2.3.6. Mount Revelstoke and Glacier Designated Aquatic Ecologically Sensitive Sites

Beaver Valley Fen ESS

The Beaver Valley Fen is a unique calcareous spring-fed wetland precariously located between the Trans-Canada Highway and railway in Glacier National Park. The fen is biologically rich in plant and wildlife species, including an extremely high invertebrate biodiversity.

2.2.4. Cultural Resources

Culturally sensitive sites are described for each park, having been selected after consultation with the responsible archaeologist(s) for that park (Rod Heitzmann pers. comm. 2002; Gwyn Langemann pers. comm. 2002). There are hundreds of known archaeological sites in the parks and this number was greatly reduced by focussing only on those sites classified as Zone I, ESS and/or those expected to be affected by commercial guiding activities.

2.2.4.1. Banff Culturally Sensitive Sites

A total of 669 archaeological sites (413 Aboriginal, 231 historic, 17 both, 8 palaeontological) have been identified for the park (Langemann and Perry 2002). Clusters of Aboriginal sites occur on fans and terraces near Vermilion Wetlands and Muleshoe backwater of the lower Bow River, throughout the Red Deer River valley, Howse River valley and the lower part of the North Saskatchewan River valley, and the summit of the Pipestone-Clearwater Pass. Current backcountry campsites and horse camps are frequently located in the same place as these Aboriginal sites. The Vermilion Lakes site and Lake Minnewanka site have been C14 dated to between 10,700-9,000 BP (before present). Highly significant house pit sites are in the Red Deer River valley and near Banff townsite with C14 dates of 2800-400 BP. These sites are not found elsewhere in the Canadian Rockies and imply the presence of Salishan people in the mountains at the same time as Plains Culture groups.

Christensen Archaeological Site Zone I Area

This deeply stratified site, located along the Bow Valley Parkway, contains archaeological evidence of at least nine separate periods of occupation dating back some 8,000 years. Protection of not only the artifacts but of the entire area is considered to be important.

For ease of organization, other culturally sensitive sites and areas are listed below according to LMU (Langemann and Perry 2002: 140-142):

Management Unit 4: Siffleur and Management Unit 5: Clearwater

A concentration of 41 Aboriginal lithic sites is along the Pipestone-Clearwater Pass in these LMUs. Many of these sites are small in extent, in very shallow soils with braided trails throughout and will require monitoring regarding impacts.

Management Unit 9: Middle Bow II

There are several Aboriginal sites in the Baker Lake area located along heavily used trails and at backcountry campsites. Erosion is affecting many of these sites and monitoring is recommended for them.

Management Unit 10: Cascade-Fortymile

☞ **Site 349R:** The Minnewanka site is a significant stratified campsite on the east shore of the reservoir, between Stewart Canyon and Sheep Point. Four seasons of archaeological excavations have been conducted at the site, with the oldest strata dated to 10,370 BP. The site is impacted by lakeshore erosion and is visited by artifact collectors.

Management Unit 11: Middle Bow I

☞ **Site 1329R:** Large quartz crystal artifact scatter in upper Healy Creek is at the same location as a backcountry campsite. Upper layers of the site are eroded by trail use and several artifacts are exposed. A recommendation has been made to excavate the site.

☞ **Site 527R:** Triassic fossil fish site at Castle Mountain lookout has been vandalized in the past. A monumental rock was in the parking lot, to which plaques were attached containing fossils in its slate layers. A specimen broken in half was on the outer face of this rock, where someone tried unsuccessfully to remove the entire fish. The rock has been removed and the remaining specimens are not as visible to the public.

☞ **Site 362R:** Spring Site is a stratified house pit site consisting of a cultural depression dated to 1600 BP, with a component below Mazama ash, outside of the depression.

☞ **Site 951R:** A deeply stratified site on a large dune with cultural depressions dated to 1900 BP and 2725 BP. A quantity of lithic material is eroding from the dune.

Management Unit 12: Lower Bow

☞ **Site 98R:** The Timberline house pit site is a stratified campsite located within the Vermilion Lakes Wetlands ESS.

Management Unit 13: Spray

☞ **Site 1948R:** The historic remains of a large logging camp with several depressions and artifacts is on the Spray riverbank.

A series of depression era work camps, probably relating to road construction in the 1930s, are along the Banff-Jasper parkway. The larger camps include Site 1748R (Hector work camp), Site 2033R near Mistaya Lake and Site 2107R32 at Silverhorn

Creek. These sites, easily accessed along the old road grades, have a number of log structures, root cellars and refuse areas.

2.2.4.2. Jasper Culturally Sensitive Sites

A total of 200 Aboriginal and 226 historic archaeological sites have been recorded in Jasper up to the end of 1989 (Pickard 1989).

Jasper House Zone I Area

Jasper House has been designated as a national historic site because of the significant role it played in the fur trade. Jasper House is rich in architectural features, artifacts, and faunal remains. Archaeological remains are intact and are very important in understanding the history of the site. Management guidelines for the Jasper House and Devona Cave sites will be developed through the park's cultural resource management program.

Devona Cave Archaeological Site Zone I Area

The Devona Cave contains pictographs and other significant material that are important to understanding Aboriginal activity and trade in this area. Test excavation revealed evidence of occupation dating back to 4200 BP (Ibid: 134). The area is not identified on the zoning map due to its sensitivity and access to the cave will be strictly controlled.

Historic Log Structures

There are numerous historic log structures located throughout the park. There is considerable variation in size and shape in these structures, which include log cabins, crib burials, lean-tos, tipi poles, mining structures and corrals. These remains are a physical record of human history and use prior to park establishment or result from early park management activities. Most are collapsing through natural processes.

Attention is drawn in particular to the following historic period archaeological sites because of their generally good state of preservation, complexity, (i.e. larger, multi-feature sites), and historical significance:

- ⚡ **Site 217R:** the Bedson Mine work camp and operations site
- ⚡ **Site 283R:** Ewan Moberly Homestead site and Suzanne Cardinal Grave Site located on the west side of the Athabasca River just off the Celestine Lake Fire Road
- ⚡ **Site 311R:** John Moberly Homestead site, located on the Overlander Trail on the east side of the Athabasca River north of Jasper townsite
- ⚡ **Sites 1264R, 1265R, 2036R and 2037R:** four large lumber work camps (railroad ties) located in the lower Whirlpool Valley in use during the 1920s
- ⚡ **Site 1871R:** the large Canadian Northern work camp located on the west side of Jasper Lake, mid-way
- ⚡ **Site 1982R:** Historic cabin (constructed 1872) at the mouth of Ross Coxe Creek in the lower Whirlpool Valley
- ⚡ **Site 1984R:** the historic Canadian Northern Railway work camp known as Summit City, located at the summit of Yellowhead Pass.

2.2.4.3. Yoho Culturally Sensitive Sites

As of the end of 1989, 12 Aboriginal and 81 historic sites were identified for the park (Choquette and Fedje 1993). Several high potential management units and watersheds have yet to be archaeologically surveyed, so the potential exists for additional (especially Aboriginal) sites to be found.

Site 502T

Aboriginal lithic scatter which is located near the north end of a large meadow on the north side of the McArthur Pass. Cultural materials were exposed by pedestrian traffic on the trail from Cataract Brook drainage to the pass. The site is considered vulnerable to further visitor use (Ibid: 83).

Historic Log Structures

There are numerous historic log structures located throughout the park. There are considerable variations in the size and shape of these structures, which include log cabins, lean-tos, mining structure and corrals. These remains are a physical record of human history and use prior to park establishment or result from early park management activities. Most are collapsing through natural processes.

Attention is drawn in particular to the following historic period archaeological sites because of their generally good state of preservation, complexity, (i.e., larger, multi-feature sites), and historical significance:

- ⌘ **Site 1421T:** Camp Otter, multi-feature World War I internment camp dating to 1915, located on the north side of the Kicking Horse River.
- ⌘ **Site 1422T:** Boulder Creek Camp, multi-feature World War I internment camp dating to 1915, located on the south side of the Kicking Horse River.

2.2.4.4. Kootenay Culturally Sensitive Sites

As of the last ARDA (Archaeological Resource Description and Analysis) produced for the park, 51 Aboriginal archaeological sites and 34 historic sites were recorded (Choquette and Pickard 1989). Listed below are those sites most affected by visitor use.

Iron Gate Pictographs ESS

The Iron Gate Pictographs are a sensitive cultural resource located in Sinclair Canyon. The site consists of five separate panels of figures drawn in red ochre on flat rock faces above the left bank of Sinclair Creek about 250m northeast of the Iron Gates Tunnel (Ibid: 64).

- ⌘ 423T: Located on the bedrock ridge that forms the north side of the “Iron Gates” and is directly on top of the Iron Gates Tunnel. An age range of 1700 BP to 300-500 BP is suggested for the upper component (Ibid: 64). Severe trampling has devegetated much of the site surface.

The Paint Pots

The Paint Pots are one of the most popular hiking destinations in Kootenay. They have been used as a source of red ochre by Aboriginal peoples and have spiritual and

ceremonial significance. In the early twentieth century the Paint Pots were mined as a colourant for paint. The remains of mining equipment are located throughout the area.

Kaufmann Lake Sites

Several Aboriginal sites are located at Kaufmann Lake. At these locations, clear quartz crystals were made into stone tools. The remains of stone working debris are scattered over the campsite area and on adjacent trails. Two of these Aboriginal sites are:

≠# **472T**: Aboriginal campsite with a buried cultural component perhaps dating as far back as 2000 BP located on the west side of Kaufman Lake. Erosion along the trail and in the tenting areas in the lake vicinity exposed lithic artifacts and two hearths (Ibid: 105).

≠# **377T**: Aboriginal lithic scatter near site 472T on west shore of Kaufman Lake with the trail along the lake passing through the site. Cultural material was found on the slope extending up from the lakeshore to a camping area containing an outhouse and tenting pads (Ibid: 106).

Passes

Aboriginal sites are located at the summit of several passes in the park including Sinclair-Kindersley pass and Wolverine Pass. These consist of the remains of stone working debris.

Other Aboriginal Sites

Other Aboriginal Sites are located throughout the park. Most of these consist of buried stone tools, bones and other cultural materials. Occasionally some of these materials are exposed on the surface through erosional processes.

≠# **424T and 425T**: two Aboriginal lithic scatter sites on bedrock ledges along the Juniper Trail leading into the Sinclair Valley have been exposed by foot traffic (Ibid: 63).

Historic Log Structures

There are numerous historic log structures located throughout the park. There is considerable variation in the size and shape of these structures, which include log cabins, lean-tos, mining structure and corrals. These remains are a physical record of human history and use prior to park establishment or result from early park management activities. Most are collapsing through natural processes.

2.2.4.5. Waterton Lakes Culturally Sensitive Sites

Archaeological Sites Zone I Area

There are 286 known archaeological sites in Waterton Lakes, dating back almost 11,000 years (Perry et al. 1997). Zone I designations are applied to the most significant of these sites. Most sites are in the Waterton Lakes-Waterton River valley and Blakiston Creek valley. These narrow, V-shaped valleys also funnel in natural erosion such as flooding and wind. Approximately 20 precontact sites are along the north high bank of Blakiston Creek, in the location of a horse trail, and all are slightly threatened by this use.

Most high altitude areas have been inventoried for ceremonial sites and include stone cairns, alignments and vision quest sites. These sites are easily disturbed and the vision quest sites, some of which are still in use today, are usually on sight lines for visible places of spiritual significance and thus are especially susceptible to visitation and damage by climbers. Current sites such as ribbon sites are very prone to disturbance as the ribbons are very visible and most visitors are unaware of their significance.

Visitor use and other development-related activities have disturbed 36% of the sites. Many key sites have roads, park facilities, campsites or picnic areas on top of them. Special care must be given to ensure that no disturbance occurs by the development of overlying facilities.

Lineham Discovery Well Zone I Area

The Historic Sites and Monuments Board of Canada recommended the Lineham Discovery Well, the first oil well in Western Canada, as a national historic site in 1965. The site is marked with a plaque that commemorates the "First Oil Well in Western Canada". Oil City (1508R) is the site of this well and has several significant related artifact scatters and features, which could be vulnerable to pot hunting and trail erosion.

Other Culturally Sensitive Sites

≠ **Site 762R:** stratified campsite located at Red Rock Canyon day use area, possesses the oldest date of any site in the park at 8270 BP. The site is affected by use of the parking and picnic areas and no further development should be permitted here.

2.2.4.6. Mount Revelstoke and Glacier Culturally Sensitive Sites

The known archaeological resources of the two parks consist exclusively of historic period sites and features commencing with railway construction in the 1880s. There have been seven sites recorded in Mount Revelstoke and 133 sites in Glacier National Park (Francis and Perry 2000), including 86 sites in Rogers Pass National Historic Site. No substantive Aboriginal sites have been identified within either park.

In addition to various historic backcountry log cabin sites in both national parks, and the large inventory of historic railroad-related archaeological sites located along the 1885 and 1916 rail grades through Glacier National Park, attention is drawn to the following culturally sensitive archaeological site:

Glacier House (22T)

Glacier House is located in Rogers Pass National Historic Site, 5km south of the Rogers Pass Interpretive Centre and just south of the Illecillewaet Campground facility. The house was operated by the CPR from 1886-1925 as a hotel and station. It was demolished in 1929 and has since been impacted by pot hunting (looting) and by pedestrian traffic as it is located at a popular trailhead. An interpretive walking trail is being constructed through the complex of building remains. Visitors must be strongly encouraged to remain on the trail at all times.

2.2.5. Visitor Experience

The visitation to the mountain parks in 2001-2002 was between 413515 visitors in Waterton Lakes and 4 687378 visitors to Banff (Table 3). Associated with these visitors is a variety of infrastructure, services, recreational activities and commercial activities, including townsites, ski hills, campgrounds, hiking trails, bus tours and other activities.

Table 3. Visitation to mountain national parks in 2001-2002

National Park	2001-2002 Visitation
Banff	4, 687, 378
Jasper	1, 947, 286
Kootenay	1, 590, 596
Yoho	1, 371, 105
Mount Revelstoke and Glacier	566, 679
Waterton Lakes (no through highway)	413, 515

The quality of visitor experience to a park is a complex mix of values, perceptions, opportunities and events. Surveys are used to try and understand what are some of the most important factors affecting visitor experience. The focus of assessing visitor experience in this assessment is on visitors in zones 1, 2 and 3 because that is the scope of the activities assessed in the assessment. An exit survey of non-commercial users on Bryant Creek, Skokie, Cascade, Forty Mile Creek and Johnston Creek trails in Banff showed that although about 37% of visitors experienced some degree of crowding, the number of people on the trail did not affect most people's backcountry experience. Respondents felt that encountering 28 day hikers per day and 24 backpackers was acceptable, but only 7 horseback riders was acceptable (Canadian Heritage Corporate Services 1994). In Kootenay, 35-43% felt some degree of crowding in 1995, but their perceived visitor experience was not affected by these encounters. Encountering people on horses detracted from visitor experience. Overnight users felt that only 0.9 encounters with people on horses was acceptable (Canadian Heritage Parks Canada Business Services Group 1995c). Similar results were found for overnight visitors in Jasper and Yoho in 1995 (Canadian Heritage Parks Canada Business Services Group 1995a; Canadian Heritage Parks Canada Business Services Group 1995b). A survey in the Tonquin Valley of Jasper in 1998 found that horseback riders detracted from the experience of hikers, but all other users added to the experience of horseback riders (Western Canada Service Centre 1998).

Visitation in the parks has increased by between 1% and 32% over the past 5 years (2% in Kootenay, 32% in Yoho, 1% in Rev/Glacier, 10% in Banff, 11% in Jasper, 12% in Waterton Lakes). There is not sufficient information about overall use to give an indication of the relative amount of commercial use. In Jasper 17 of 31 commercial guided companies (55%), reported that the number of clients served has increased over the past 5 years. Nine companies (29%) saw no change, while 5 (16%) companies experienced a decrease in the number of clients served (Parks Canada 2002a). In Banff, Kootenay and Yoho, all companies, with two exceptions, stated that the number of clients

has increased or at least remained unchanged over the past 5 years. In general, increases in backpacking, camping, and winter activities are the current trend in the United States and likely in Canada as well. Horse activity in general has been decreasing (Cordell et al.).

3. Analysis of Environmental Effects

This section of the MCSR outlines the environmental effects and mitigation associated with land-based commercial guiding activities. The section begins with a description of the activities within the scope of the model. The environmental effects and mitigation associated with each activity are then outlined and discussed by VEC. Site-specific sensitivities are identified by Park and site-specific mitigations are outlined where appropriate. Residual environmental effects are identified and evaluated for significance. The process for the evaluation of cumulative effects through the CSPR and business licencing process is outlined. The Section concludes with a discussion of the surveillance and follow-up activities required to monitor the impacts of land-based commercial guiding activities.

3.1. Descriptions of Activities

Section 3.1 begins with a discussion of unique characteristics of commercial guiding activities that may distinguish the general group of activities and associated impacts from those of independent park users. Each activity covered under the model is then described in detail.

3.1.1. Unique Characteristics of Commercial Guiding Activities

Several characteristics may make some commercial guiding activities unique when compared to similar activities undertaken by independent park users. This section discusses typical differences between guided activities and the activities of other visitors.

The services of a professional guide may provide the only means for many unskilled or inexperienced park visitors to safely and comfortably, visit and appreciate more remote areas of the parks. Many people would not take part in certain activities in the park without the availability of a guide. As a result commercial guided activities may, in some cases, have the effect of increasing overall visitor use in areas that would otherwise see lower levels of use. The presence of a guided group may also, in some cases, attract other visitors to sites or locations that would not have otherwise been visited.

One of the primary unique characteristics of commercial activities is the presence and influence of trained professional guides. Guides often take the opportunity to inform clients about the region's physical and cultural characteristics, as well as educate them on issues related to ecological integrity and park management. Many guiding operations have a strong focus on outdoor skill development and safety leading to an increase in the number of experienced and skilled backcountry users. The presence of skilled, professional guides provides an additional measure of safety for all backcountry visitors including independent users.

Some guided activities typically support larger group sizes than those of independent park users. Non-commercial activities have an average group size of 2.5 to 2.8, while commercial guided hikes have an average group size of 8 in Banff, Kootenay and Yoho

(Canadian Heritage Parks Canada Business Services Group 1995a; Canadian Heritage Parks Canada Business Services Group 1995b; Canadian Heritage Parks Canada Business Services Group 1995c). Jasper's average group size is 6, with a mode of 2 (Parks Canada 2002a). Commercial mountaineering and winter trips are usually smaller, averaging 3 to 5 clients depending on the activity. In Banff, the average group size of all horse trips (including those not within the scope of the MCSR) is 5 people and 8 horses. Large groups have the potential to result in increased disturbance to wildlife and vegetation and may detract from visitor experience. It should be noted however, that the potential impacts of large group sizes are countered by a theoretical decrease in the number of actual disturbance events.

A small portion of guided groups travel in the early morning or evening for birdwatching, wildlife viewing, night walks and star gazing (10 out of 57 companies surveyed in Banff, Kootenay and Yoho offered regularly scheduled hiking trips before 9 am or after 6 pm). Mountaineering, rock climbing, and winter activities may require departures early in the morning to reach their destinations, for safety considerations, or to avoid crowded trail conditions. Because morning and evening hours are active times for wildlife, visitor/wildlife encounters may be more common during these hours. Despite the use of early and late departure times by commercial operators, the use of these shoulder times is not really unique to commercial operations. Although the bulk of independent trail use takes place throughout the middle of the day, many independent parks users also make use of early and late travel times for the same reasons as commercial users.

3.1.2. Guided Hiking

Primary activities falling under the environmental assessment of commercial guided hiking include day hiking, interpretive hiking, and glacier walking on established or informal trails. Commercial operations involved in these activities primarily utilize existing trails and park facilities, although not exclusively so. Areas that do not have maintained trails are also used, such as scrambles, glaciers, canyons and frozen lakes.

Guided excursions are usually staged from existing trailhead facilities and groups make use of access roads, parking areas, privies, garbage containers and public telephones. Clients often arrive at the staging area by private vehicle. Some commercial operations offer transportation to the trailhead.

Day hiking is licenced on all trails recognized by Parks Canada between April 1 and October 31.

The majority of guided activities take place during daytime hours (between 9 am and 6 pm). Companies stated that they do not regularly, as part of their guided programs, undertake activities before 9am or after 6pm. There are some activities that take place outside of these hours such as beaver watching, bird watching, full moon walks, evening canyon crawls and snowshoeing. Occasionally, operators will begin before 9am to shuttle to a trailhead and return after 6pm if a group is slow. Some companies shift departure times to begin early and avoid crowds (Glenfield 2002a).

Summer (June-August) is the busiest season for guided hiking in the mountain parks. The second busiest season for guided hiking is autumn (September-October). Winter is a season of increasing demand for guided hiking services though many companies are not engaged in winter activities in the mountain parks. Spring (April-May) is the least busy season for commercial guiding operations. The duration of day trips varies from two hours to a full day. Overnight trips vary from one night to multi-day trips.

Hiking groups do more than simply travel from point to point along a trail system. They make use of facilities on trails such as bridges, interpretive signs, lunch stops and backcountry privies. In addition to physical activity, many hikers hope to experience and view wildlife, engage in photography, take food and rest stops, and enjoy mountain scenery. Aesthetics and a sense of solitude are important to many hikers including those in guided groups. Some guided excursions have an educational theme focusing on outdoor skills development and natural or cultural history interpretation. To engage in many of these activities, guided groups or individuals may move off-trail, expanding the spatial extent of their activities to areas that are sometimes well beyond that of the established trail surface.

3.1.3. Mountain Guiding

The primary activities falling under the class screening of commercial mountain guiding include hiking and backpacking primarily off of established trails for the purpose of accessing mountaineering areas as well as rock climbing and general mountaineering. Commercial mountain guiding does not include winter activities in this class screening. Many mountaineering excursions are staged from the same trailheads as guided hiking groups and utilize the same trails systems and facilities for accessing climbing and mountaineering areas.

Mountain guiding activities begin to differ from those of guided hiking when inevitably the group moves off of the established trail system. Mountaineering groups utilize virtually every type of terrain and environment in the mountain parks. Groups may bushwhack through forest or brush, and cross rivers, alpine meadows, scree slopes, boulder fields, mountain ridges, snowfields and glaciers as part of accessing mountaineering routes or areas. Mountaineering routes involve scrambling and rock climbing on mountain ridges and faces, and on rock buttresses and outcrops.

Climbing activities involve the use of ropes, slings and specialized hardware for ascent and descent. Bolts and less often, pitons, along with slings and other hardware may be placed permanently along climbing routes for fall protection, construction of belay stations and rappel anchors. As with guided hiking many mountaineering excursions are educational although the focus is usually on outdoor skill development as opposed to natural or cultural history interpretation.

3.1.4. Horse Outfitting

Horse outfitters to whom a Licence of Occupation has been issued are exempt from this screening, as they will have conducted a separate environmental assessment for their business. Therefore, the business licences that pertain to this screening include day rides and wilderness trips that are staged from horse stables located outside the park.

Wilderness trips use trails in wilderness areas and camp at designated horse campsites or in semi-permanent camps (Parks Canada 2002b). Guided horse activities share the trails and landscape with other user types such as cyclists and hikers as well as wildlife. Guided horse activities represent a relatively minor portion of human use on trails but represent the majority of all horse use in the parks (Parks Canada 2002b).

Accessory activities include:

- ⌘ Use of trailhead facilities for horses including hitching rails, loading ramps, holding corrals
- ⌘ Use of trailhead facilities for clients including parking areas, privies, garbage containers and public telephone
- ⌘ Use of day trails and facilities on trails including bridges and hitching rails
- ⌘ Use of wilderness trails and facilities on trails including bridges, lunch stops, privies, hitching rails and campsites
- ⌘ Use of campsite facilities for campfires, wall tents, horse graze and water
- ⌘ Pack stock support for hiking groups

Horse outfitter activities generally occur between May and October for the day riding stables and June to September for wilderness trips. Duration of day rides ranges from one hour to a full day. Overnight trips vary from two nights to multi-day trips.

3.1.5. Overnight Use

Primary activities falling under the environmental assessment of overnight backcountry use include camping at both established and random sites, bivouacs, campfires, food handling, and waste disposal. Users may access an overnight site, whether established or random, through participation in any of the other guided activities. Use of permanent backcountry accommodations such as lodges, huts or commercial camps is not included as part of the MCSR.

Overnight users establish camps or bivouacs by setting up tents and tarps and establishing cooking areas. Food is often prepared on-site using camp stoves or campfires in designated areas. Food, food wastes and equipment must be stored at the site. Overnight users may establish campfires where they are allowed using wood supplied by the park or by gathering deadwood. Human waste is disposed of at backcountry privies at established campsites. While at camp, individuals and groups often congregate under tarps and around the cooking area. Groups may explore the surrounding area often by using informal trails or by travelling off-trail.

Camping is permitted in designated campsites or random camping in wilderness areas by issuance and purchase of a Wilderness Pass from Parks Canada. Overnight hiking may be horse assisted.

3.1.6. Winter Activities

Commercial winter activities include skiing, ski mountaineering, ice climbing, and snowshoeing on and off established trails. These activities typically take place from November to April each year and in some cases involve multi-day trips. As with guided hiking, many winter excursions are highly educational, although the focus is usually on

outdoor skill development and adventure as opposed to natural or cultural history interpretation.

Ski mountaineering groups access backcountry areas for “off-piste” skiing experiences away from groomed conditions and crowds at downhill ski resorts. Ski mountaineering groups are most active on the icefields of the continental divide especially the Wapta Icefield straddling the Banff/Yoho boundary. As with summer mountaineering activities, ski mountaineering groups access the high country by using many of the same trails and routes as other winter trail users including cross country skiers and snowshoers.

Cross-country commercial groups primarily make use of groomed trails in the main valley bottoms. Most cross country operations are focused on beginning level instruction and on providing entry-level skiing experience. Snowshoe tours are similar to cross country skiing activities except that, given the nature of the activity, considerable snowshoe activity takes place off of established trails. Because of the importance of travelling through untracked snow to the nature of the activity, snowshoe operators may make use of different routes for each excursion.

Ice climbing activities take place on frozen waterfalls and groundwater seeps at a wide variety of locations throughout the mountain parks. As with ski mountaineering activities, ice climbers often use established valley bottom routes to access climbs.

3.2. Activity Specific Analysis

This Section discusses the environmental impacts and mitigation associated with specific land-based commercial guiding activities. The discussion is organized by impact on VEC. For each VEC environmental impacts and mitigations are identified that are associated with, and applicable to, all land-based guiding activities. Additional impacts and mitigation are identified for specific activities that may affect a specific VEC and that are not applicable to all guided activities. The impacts and mitigation associated with overnight use are generally addressed under impacts applicable to all land-based guiding activities, or under the impacts of specific activities as appropriate. The potential effects of the environment on project activities, and the potential effects of accidents and malfunctions are also discussed.

3.2.1. Introduction

The activity specific analysis focuses on environmental effects that most commonly occur as a result of land-based commercial guiding activities. A review of literature was used to identify the most common effects of each type of activity on the VECs identified in section 1.7.2. Based on literature and existing practices, mitigation measures were identified to mitigate for environmental effects described. In addition to sources specifically referenced, mitigation was developed and cross checked against best management practices based on the work of Harmon (Harmon 1994), Klassen (Klassen et al. 1999) and NOLS (NOLS 2002).

In Appendix 2 mitigation measures were developed into “best management practices” (BMPs) to be used by guides when conducting guiding operations. The mitigation measures in the following sections apply to all guiding operations included in the scope of the Model Class Screening. The terms “operator” and “operation” refer to the company offering a guiding service. The term “guide” refers to the individuals actually in the park leading visitors on a commercial outing.

In addition to the measures outlined in the Model Class Screening, business operators and guides are expected to comply with any local park regulations, policies, guidelines, travel restrictions, area closures, established reservation systems or other directives issued by Parks Canada for the purpose of mitigating environmental effects or ensuring public safety.

Guides are expected to act as stewards, set proper examples for trail etiquette, and educate guests on the importance of keeping areas pristine. Guides are expected to monitor client actions and ensure that minimal impact practices are implemented.

3.2.2. Wildlife

3.2.2.1. Environmental Effects of All Guided Activities - Wildlife

Effects of guided recreational activities on wildlife can include physical displacement from an area, disruption of the animal's activities through fragmentation of habitat, and habituation and interactions with humans.

Repeated disturbance of wildlife by people may result in wildlife moving away from familiar habitat and in changes to home ranges (Hammit 1987). Larger groups of visitors are a greater threat to wildlife and create more noise, resulting in a greater likelihood of disturbance. However, if larger groups reduce the number of disturbances, they could benefit wildlife and provide additional safety to visitors. Frequent disturbances also are more likely to displace wildlife. Displacement may result in an increased vulnerability to predators and competitors or poorer quality of habitat. Disturbance of birds in nests can cause the birds to abandon their nest where predators/parasites could prey on the eggs while they are away. Similarly, wildlife may abandon a den or young. Large carnivores such as bears and wolves seem to be particularly affected by human presence because they require larger areas without disturbance. Core carnivore habitat is fragmented by trail networks, roads and other human activity. A strong case exists for preserving areas where wary carnivores will be secure from encounters with humans, and where they can meet their energy needs (Gibeau et al. 1996).

Wildlife movement is also affected by the presence of humans. Wildlife may not be able to move naturally through their home range or to other areas if human activity blocks their path. Wildlife use informal trails as travel paths or ‘movement corridors’ to avoid human use on designated trails. As human use increases on non-designated trails, wildlife are displaced from their established feeding and travel paths (Parks Canada 2002). In winter, wildlife can use cross-country ski or snowshoe trails to move more easily through the snow.

Habituation occurs after repeated interactions between people and animals. Animals and birds such as ground squirrels and Clark's nutcrackers will beg for or steal food at lunch sites, in campsites and on trails (Parks Canada 2002a). This type of behaviour may lead to animals becoming a nuisance and altering their natural feeding habits. Wildlife that become threats to public safety (black bears, grizzly bears, elk, wolves and cougars) may be removed, relocated or destroyed. Unleashed dogs are likely to chase wildlife, and in some instances, may attract bears towards their owners, resulting in a conflict that may end in the injury or death of the owner and/or death of the bear (Spowart 1990). Wildlife may also dig up plants or soil when attracted to the salts left behind after urination (Parks Canada 2002c).

3.2.2.2. Mitigation for All Guided Activities - Wildlife

- ⚡ As part of a pretrip briefing, operators and guides shall ensure that all clients are: aware of wildlife sensitivities and potential hazards; understand wildlife viewing and safety procedures; and are aware of National Parks regulations on feeding, enticing or disturbing wildlife.
- ⚡ Wildlife viewing and safety procedures should be based upon the guidelines presented in Parks Canada brochure "Keep the Wild in Wildlife". The brochure describes appropriate behaviour when encountering habituated wildlife, safe distances for viewing and photographing wildlife, avoiding encounters and limiting attractants while travelling in the backcountry, and specific precautions for bears, elk and cougars. This brochure can be found on the Banff National Park of Canada internet site (<http://www.worldweb.com/parkscanada-banff/visinfo.html>). Other safety information regarding wildlife in the mountain parks is available on the internet at <http://www.worldweb.com/parkscanada-banff/pubsafe.html>. Where practical, operators should recommend these websites to clients during the time of booking.
- ⚡ Guides shall manage groups during wildlife viewing opportunities such that the animal's normal behaviour is not disturbed by not approaching wildlife, keeping lines of escape open for the animal and clients, and keeping groups close together. Use binoculars in situations where it is desirable to enhance viewing opportunities.
- ⚡ Guides shall maintain a distance of at least 100 metres from bears and a distance of at least 30 metres from elk and other large wildlife species.
- ⚡ Guides shall maintain a distance of at least 300 metres from known wildlife den sites and minimise close contact with nesting birds or young animals.
- ⚡ Guides shall leave the area immediately in the event that dens, nests or young animals are accidentally encountered.
- ⚡ Operators should discourage clients from bringing dogs on guided excursions. In the event that it is necessary to bring a dog, they are to be kept on leash at all times and must not be left unattended.
- ⚡ Guides and operators are asked to report wildlife sightings, unusual wildlife behaviour, encounters with wildlife, injured animals and carcasses to Parks Canada. Marked animals (radio collars, ear tags, leg bands on birds, neck bands on swans) and injured animals should also be reported.
- ⚡ Operators and guides shall implement alternate trip or route plans as required to avoid close encounters with wildlife.
- ⚡ Operators and guides shall ensure that food and food smells are managed to avoid enticing wildlife:

- ⌘ All garbage and food waste must be packed out. Garbage or food waste shall not be burned, buried or otherwise disposed of in the backcountry.
- ⌘ All food, including pet food and livestock feed, should be stored in special caches provided, or hung between two trees at least 4 metres above the ground.
- ⌘ All dishes and food utensils shall be washed and stored immediately after use. Food particles shall be strained from dishwater and stored with garbage.
- ⌘ Guides shall ensure that groups keep trailhead areas and facilities clean to minimise the high percentage of animal mortality that occurs near human infrastructure (Parks Canada 2002a)

3.2.2.3. Environmental Effects of Specific Activities - Wildlife

Horses

Horse outfitter businesses are not subject to seasonal area closures such as elk calving areas or area closures for bears (Parks Canada 2002b). They operate under guidelines and with precautions as directed by park's human/wildlife conflicts specialists. When trails or areas are restricted or closed for public safety reasons, commercial outfitters are normally permitted to travel through, observing protocols such as staying together as a group and not stopping or camping in certain areas. Horseback is viewed as a relatively safe way of travelling in bear country (Herrero 1985).

Winter

Because of the appeal to go off-trail and travel in untracked snow, off-trail winter activities that take place below treeline such as snowshoeing, and ski touring are likely to impact wildlife. While off trail travel is aesthetically appealing, it also enlarges the spatial impacts of recreational use (Parks Canada 2002a). This may lead to displacement and increased impacts on wildlife, and stress animals at a time when they are in their weakest physical condition. Another ramification of this activity is that the establishment of a trail network allows carnivores such as wolves and coyotes to expand their range by following these new trails.

3.2.2.4. Mitigation for Specific Activities - Wildlife

Horses

- š In base camp situations, in core grizzly bear habitat, operators should consider the use of 4-strand electric fence to exclude bears from food storage and kitchen areas.

Winter

- ⌘ Operators shall educate clients on the potential impacts of winter recreation and on minimum impact practices as applied to winter activities.
- ⌘ Operators should limit excursions in known areas of important lynx or wolverine habitat or winter caribou habitat.
- ⌘ Guides shall minimise the number of individual snowshoe or ski tracks established into an area.
- ⌘ Guides shall not follow wildlife tracks in order to ensure or enhance viewing opportunities.
- ⌘ Where feasible operators and guides shall avoid early morning or night trips to minimise impacts to nocturnal wildlife.

Overnight

- ⚡ Cooking, eating and supply areas shall be set up at least 100 metres from tenting areas. Designated backcountry campsites may already be arranged this way.
- ⚡ Dispose of dishwater in designated areas, or broadcast at least 100 metres from your sleeping area.

3.2.3. Vegetation and Soils

3.2.3.1. Environmental Effects of All Guided Activities – Vegetation and Soils

Vegetation

Vegetation can be removed by trampling or collection, damaged by trampling or altered through invasion of non-native species. Vegetation in the upper subalpine and alpine meadows is particularly sensitive to disturbance, as growing conditions become harsher at higher altitudes.

Trampling leads to soil compaction and can reduce plant cover and density, as well as alter species composition by damaging root systems (Roe et al. 1997). Removal or reduction of plant cover can lead to soil erosion through the loss of root stabilization, particularly on steep slopes or along shorelines (Spowart 1990). Removal of vegetation in campsites may occur to facilitate tent pads, although, in most cases, the areas have already been cleared of vegetation through intensive use. New areas may be used to provide a softer site (grass, moss), a drier site (under large tree branch) or when the capacity of the site is exceeded.

Plants, particularly showy wildflowers such as orchids, wood lilies and columbine, are sometimes picked. Aesthetically, picking of wildflowers is a negative impact, as removal results in other users not being able to enjoy them. Ecologically, some species will not recover from picking and will not grow again in the next growing season. Species such as lady's slipper orchids (*Cypripedium* spp.) and wood lilies (*Lilium montanum*) are damaged so severely by annual picking they can be totally eliminated from an area.

Collection of coarse woody debris, deadfall, lower branches, standing dead and live trees may occur around campsites and picnic areas for campfires. The lack of deadfall can impact the insects and bacteria and upset the natural cycle of decomposition in the forest. The impacts of firewood collection can impoverish forest stand structure and ultimately impact the diversity of vegetation. Removal of organic material can reduce soil quality changing soil chemistry and nutrient levels (McCann 1982). Coarse woody debris is also important for small mammals and their predators.

Non-native plants such as tall buttercup (*Ranunculus* spp.), dandelions (*Taraxacum* spp.) and Ox-eye Daisy (*Chrysanthemum leucanthemum*) can be introduced by park users. Seeds may be transported and dispersed from footwear, clothing and equipment. Horses can also introduce non-native plant seeds from their food source and deposit them in their waste matter. Non-native plants threaten native species and impacts can be cumulative with potential to alter localized species diversity and composition (Roe et al. 1997).

Soils

Impacts to soils can include soil compaction, erosion and pollution. These impacts are particularly significant during wet and early season conditions.

Soil compaction is one of the most obvious and direct impacts of foot/horse traffic and camping activities (McCann 1982); Spowart 1990). Soil compaction causes changes to soil porosity, chemistry, moisture, temperature, soil microbia, as well as a loss of surface organic horizons (McCann 1982; Roe et al. 1997). Reduced moisture retention capacity may lead to runoff, erosion, trail widening and braiding in areas that are frequently used. Soil compaction can lead to secondary impacts on buried cultural resources.

Erosion is the removal of vegetation, soils and moisture from an area. Foot and horse traffic can cause trenching in trails resulting in soil enhanced moisture loss and channelization of run-off (Parks Canada 2002c). Erosion can lead to secondary impacts on buried cultural resources.

Trail braiding is the creation of multiple pathways where one trail previously existed. Trail braiding contributes to both compaction and erosion of soil. Trail braiding may be a result of wet or dry conditions. When or where trails are wet, trail users will avoid wet areas by going around them causing progressively wider detours and enlargement of the wet area (Parks Canada 2002c). In dry conditions, trail users will detour to avoid sections of exposed stones and roots. Trail braiding can result in large patches of denuded terrain, particularly on hillsides, where the magnitude of terrain damage is compounded by erosion. At higher elevations, braiding frequently occurs where trail users detour to avoid lingering snow patches and wet spots. The severity of impacts to soils caused by trail users depends on the intensity and duration of use, the nature of terrain, soil, drainage, and vegetation. Wet, poorly drained soils have longer recovery times than soils with better drainage. Riparian areas adjacent to watercourses are susceptible to erosion and run-off into the watercourse can be problematic.

Soil can be polluted by garbage and fuels carried into the backcountry for cook stoves.

3.2.3.2. Mitigation for All Guided Activities – Vegetation and Soils

- ⌘ As part of a pretrip briefing, operators and guides shall ensure that all clients are aware of National Parks regulations on picking or removing vegetation. Clients should be briefed on travel procedures including potential impacts to vegetation and soils prior to departure from the trailhead.
- ⌘ Guides should request that clients check for and remove any bur-like seedpods or mud from boots, clothing and pets at trailheads and dispose in garbage containers to reduce risk of new weed infestations.
- ⌘ Operators and guides should make use of existing designated trails and established facilities including parking lots, trailheads, and picnic sites where possible, appropriate and available.
- ⌘ Ensure that clients have proper footwear for the trail and trail conditions including boots and gaitors if appropriate. Soft sole shoes should be preferentially selected when trail conditions warrant and for around camp.

- ⚡ Avoid using trails that have extensive wet areas or snow patches until later in the season when soils are dry and trails are clear of snow.
- ⚡ Groups should stay to the middle of the trail even when conditions are wet to avoid widening or braiding of trails.
- ⚡ Pass on wide parts of the trails to reduce trampling and trail widening.
- ⚡ Where a maze of multiple trails exist travel on those trails most heavily used, with the most durable surface and the least potential for erosion.
- ⚡ Do not use shortcuts or cut switchbacks and inform clients of the associated environmental impacts including vegetation damage, soil erosion, and damage to trail infrastructure.
- ⚡ Avoid the use of markers or cairns except where they would encourage proper use; never blaze trees or otherwise damage vegetation to mark a route.
- ⚡ Use hiking poles as pointers, binoculars or spotting scopes, or other aids to assist in heritage interpretation from the trail and avoid having to move off of hardened surfaces.
- ⚡ Concentrate traffic routes and rest stops in areas that are established for these purposes or that are already impacted.
- ⚡ Guides and operators are asked to report adverse trail and facility conditions, vandalism, and user group conflicts to Parks Canada.

Wherever feasible commercial guides and operators are expected to limit their activities to designated trails, rest stops and other established facilities. While off-trail travel by commercially guided groups is not encouraged, it is recognized that off-trail travel is permitted in the mountain parks and is integral to certain types of activities e.g., mountaineering. Off-trail travel allows other guided groups to access and explore remote areas, improve opportunities for wildlife and natural heritage presentation, and experience group solitude. Off-trail travel can be an appropriate means of reducing the intensity of environmental impacts in and around heavily used areas, and may be used to enhance visitor experience and reduce visitor conflicts for both commercial and private users. Where off-trail travel does occur, care and discretion is required in order to ensure that the benefits of off-trail travel are realized without causing additional environmental damage. The following mitigation must be followed:

- ⚡ Guides should choose routes or locations that follow or utilise the most durable surfaces whenever possible. Rock, talus, gravel and sand are considered to be the most durable surfaces. Snow is also a durable preferred travel surface provided that groups are equipped for comfort and safety.
- ⚡ Guides should choose routes or locations that minimise impacts to vegetation and soils. Areas of naturally sparse vegetation are preferred routes as trampling can be easily avoided. Dry vegetation and soils are more durable than wet vegetation or soils.
- ⚡ Guides should use discretion in the management of group travel and select the appropriate technique depending on the circumstances. When travelling through areas of undisturbed vegetation groups should spread out laterally to avoid repeated trampling and the creation of informal paths. In circumstances where travel is on durable surfaces it may be preferable to concentrate the group in one area or along one route.

- ⚡ In general, guides should avoid concentrating use in sensitive areas such as wet alpine meadows, steep slopes and riparian areas or other areas close to water.
- ⚡ Select rest stops on durable surfaces.

Campfires are a traditional use that may enhance the visitor experience for many clients; however, operators and guides should discourage unrestricted use of fires. Operators should use gas stoves and lanterns as the primary sources of heat and light. Operators and guides shall ensure that they are aware of and comply with Park regulations, restrictions and bans pertaining to the use of campfires. Operators and guides should note that updates to restrictions and bans might occur frequently and with little notice. The National Park Fire Regulations limit campfires in the parks to certain types of facilities or equipment:

- 4(1) No person shall start or maintain any fire in a park except
 - a) in a fireplace on private property;
 - b) in a fireplace provided by the supt;
 - c) in a portable stove, hibachi or barbecue; or
 - d) when in possession of a permit issued under subsection (3).

As a result, commercial guides and operators are not permitted to build or use informal fire sites.

When using fires guides should educate clients on the environmental effects of campfire use including damage to vegetation and aesthetic impacts and best management practices as outlined below. Guides shall ensure that damage to vegetation, ground cover or soils is minimized when using campfires in permitted locations.

- ⚡ Portable stoves, hibachis, or barbeques should be set up on durable, heat resistant surfaces and away from vegetation or litter wherever possible.
- ⚡ Supplied wood should be used wherever available
- ⚡ Where supplied wood is not available use fallen deadwood found on the ground for firewood; small standing deadwood under 2” in diameter is also suitable firewood.
- ⚡ Select wood of a size that may be broken or felled by hand; avoid the use of saws or axes except for splitting supplied wood at established campgrounds.
- ⚡ Avoid breaking off the lower dead branches of trees; if required remove the branch at the trunk ensuring that no unsightly or dangerous splinters remain.
- ⚡ Guides should ensure that fires are completely extinguished, including all embers and coals and are cool to the touch.

3.2.3.3. Environmental Effects of Specific Activities – Vegetation and Soils

Mountaineering

The effects on the soil compaction and vegetation trampling are more significant for off-trail areas because many areas are undisturbed.

Horses

Horse grazing removes vegetation (may include rare species) and organic material and may result in reduced plant vigor (Sack 2000). Grazing impacts can be heavily

concentrated in smaller areas while horses are restrained. If horses are tied to trees while grazing or resting, bark and root damage may occur. Grazing on exotic species, either before entering the park or after entering the park, can further spread these species if seeds remain in manure (Sack 2000).

Soil compaction and erosion is one of the most obvious and direct impacts of horse use. Horses impact soils on trails, in corrals, at hitching rails and in grazing areas. The severity of impacts depends on soil type (poorly drained soils are more vulnerable) and density of use.

Trail braiding may be a result of wet or dry conditions. Horses will avoid wet areas by going around them causing progressively wider detours and enlargement of the wet area. In dry conditions, horses will detour to avoid sections of exposed stones and roots. At higher elevations, braiding frequently occurs where horse trains detour to avoid lingering snow patches and wet spots (Parks Canada 2002b).

3.2.3.4. Mitigation for Specific Activities – Vegetation and Soils

Mountaineering

- ⚡ Guides shall instruct clients on the sensitivity of alpine vegetation to trampling and disturbance.
- ⚡ Guides shall select routes and stopping areas on hardened surfaces whenever possible in alpine areas.

Horses

- ⚡ Operators should educate clients on the potential impacts of horse use and low-impact travel and camping practices specifically for horse users.
- ⚡ Operators and guides are expected to restrict horse use to established park trails at all times unless public safety is at risk.
- ⚡ In no circumstance shall operators or guides use existing informal trails or establish new informal trails.
- ⚡ Use light restraints or only restrain the “herd boss” in order to minimize concentrated impact on the vegetation.
- ⚡ Use solar-powered electric fences or hobbles to control horses while resting or grazing.
- ⚡ Follow park procedure with respect to feeding horses.
- ⚡ Provide lightweight equipment or require that clients bring their own lightweight equipment, including food, tents, and stoves to help reduce the number of horses needed.
- ⚡ Reduce the duration of stay at each site and keep groups as small as possible to disperse impact.
- ⚡ Concentrate horse related activities on hardened sites (corrals, hitching rails) and avoid creating new areas of soil compaction.
- ⚡ Guides shall instruct riders to stay on established trails and will concentrate horse traffic on one trail rather than contributing to trail braiding.
- ⚡ Guides shall control pack stock in areas susceptible to trail braiding.
- ⚡ Avoid using trails that have extensive wet areas or snow patches until later in the season when soils are dry and trails are clear of snow.

⚡ Avoid bringing salt or ensure that it is given to the horses over a tarp.

Overnight

- ⚡ Operators and guides should make use of existing designated campgrounds and tent pads where possible, appropriate and available.
- ⚡ Concentrate tents and camp kitchens in areas that are established for these purposes or that are already impacted. Avoid making shortcuts between camps or kitchen areas.
- ⚡ Select campsites on durable surfaces. Disperse tents, avoid repetitive traffic routes and concentrate kitchen and tarp sites where possible on rock, sand or gravel or naturally unvegetated sites.
- ⚡ Do not “clean” sites of organic litter. Renaturalize campsites and rest stops when leaving by covering scuff marks, replacing sticks or branches, raking matted grasses etc.
- ⚡ Guides should monitor the impacts around campsites and move or rearrange camp as necessary to avoid permanent damage to vegetation or soils.

3.2.4. Water Quality

3.2.4.1. Environmental Effects of All Guided Activities – Water Quality

Impacts to aquatic resources are in riparian areas and water quality. Aquatic species including fish, birds (dippers, ospreys, ducks, geese), amphibians (toads, frogs, salamanders) and mammals (mink, otter) may be disturbed where trails cross watercourses or follow shorelines on rivers and lakes, and by campers at water collection points (Parks Canada 2002). There is a potential for changing habitat dynamics if riparian areas (vegetation, soils, landform) are adversely impacted by foot traffic. Loss of riparian vegetation can result in changes to water temperature and quality and can affect fish habitat.

Potential impacts to water quality can be chemical and bacteriological. They may include impacts to water clarity, water quality, aquatic species populations and distribution, and habitat change (Parks Canada 2002c). Sources for drinking water and human waste disposal are concerns as they can impact both human health and the environment. There are also potential impacts to aquatic species such as fish, amphibians, birds and mammals that use the aquatic environment as a food source. Drinking water can be contaminated directly or from runoff from human feces that may carry bacteria, giardia, hepatitis and other diseases. Surface and groundwater contamination can occur at campsites by improper disposal of garbage and direct deposit of gray water into water bodies from dishwashing and bathing. Washing dishes and bathing in streams and lakes leaves soap residues (Parks Canada 2002c).

Many factors influence water turbidity including wind action, water source, water temperature, nutrient levels, water chemistry, aquatic vegetation, productivity, substrate, erosion and run off. Of these, erosion and runoff can be altered as a result of disturbance by foot traffic and camping activities (Parks Canada 2002c). These effects may occur at stream crossings, on trails adjacent to rivers and lakes, and at or near backcountry campsites and lodges adjacent to water bodies.

3.2.4.2. Mitigation for All Guided Activities – Water Quality

Operators and guides should be aware that riparian areas are often susceptible to damage through trampling due to wet soil conditions. Locations close to natural water bodies are among the most popular and attractive visitor destinations in the mountain parks and contribute significantly to the visitor experience. Aquatic wildlife, groundwater and surface water resources and riparian areas are among the most sensitive ecosystem features that may be impacted by outdoor recreation activities. Environmental management and mitigation is focused on preventing direct damage to sensitive aquatic wildlife and riparian vegetation and preventing chemical contamination of water resources.

- ⚡# Guides should advise clients to bring their own water where feasible.
- ⚡# When group water resources must be refilled guides should select access points on durable materials or use crossing structures wherever possible. Treat water as appropriate for drinking.
- ⚡# Guides should avoid deviating from established trails and rest stops adjacent to streams and lakes unless durable surfaces or dry surfaces are used. Rest stops and campsites should be placed on high dry ground away from the waters edge.
- ⚡# Use bridges where available to minimize damage to stream banks at water crossings.
- ⚡# Use alternate travel routes to and from the waters edge to avoid the development of new informal trails.

Operators and guides should ensure that human waste is minimized and handled appropriately in the field to avoid visual and aesthetic impacts as well as to protect water sources from contamination.

- ⚡# Encourage outhouse use at trailheads before clients begin hiking.
- ⚡# Schedule rest stops where toilet facilities exist.
- ⚡# Where rest stop facilities do not exist, guides should carry a small spade, toilet paper, hand wipes, and plastic garbage bags to ensure proper disposal of human waste and garbage.
- ⚡# Bury solid human waste when possible at least 50 m (164 feet) from watercourses in a cathole covered with between 10-15cm (4-6 inches) of mineral soil.
- ⚡# In areas where no active soil exists solid human waste should be covered but left near the surface to facilitate desiccation and dispersal.
- ⚡# Pack out toilet paper, hand tissues or any other personal human waste products.
- ⚡# Guides should schedule “bathroom breaks” at random locations before arriving at rest stops or scenic viewpoints to reduce visual and aesthetic impacts and to avoid concentration of potential contaminants in one location.

Operators and guides should take measures to prevent and minimize potential water contamination associated with human activities such as washing, bathing, and cooking.

- ⚡# Never deposit garbage, food wastes or wastewater refuse in streams or lakes.
- ⚡# Use biodegradable soaps for dishwashing and bathing when soap is necessary.
- ⚡# Bathe or wash away from water sources and avoid durable surfaces that lead directly to the water so that gray water may be absorbed and filtered by vegetation and soils before reaching any body of water.

- ⚡# Dispose of gray water by screening and/or removing all food particles, then dispersing at least 50m (200 feet) away from watercourses and sleeping areas.
- ⚡# Treat drinking water by filtering, boiling or use of iodine to prevent disease.
- ⚡# Store fuel in leak proof containers and use a funnel when pouring fuel from a container into a stove to reduce spillage.
- ⚡# Guides shall not dispose of excess fuel, food or materials anywhere in the backcountry – any excess food fuels or materials must be packed out and disposed of at an approved facility.

3.2.4.3. Environmental Effects of Specific Activities – Water Quality

Mountaineering

Creeks and rivers may be affected by mountaineering because off-trail use may require fording without the use of bridges or crossing structures.

Horses

Contamination of drinking water sources by horse manure is a concern. Water sampling conducted in Jasper and Banff at horse camps indicated that drinking water standards were being met (Parks Canada 2002b). Fecal coliform contamination in surface waters indicates the likely presence of pathogens. Contamination is most likely if horse manure is deposited directly in surface waters, but is relatively rare for free-roaming animals. Drying strongly reduces the probability of contamination and horse manure tends to be drier than cattle manure. Urine deposits create patches of high nitrogen concentration.

3.2.4.4. Mitigation for Specific Activities – Water Quality

Mountaineering

- ⚡# Guides shall avoid trails that require fording as much as possible.

Horses

- ⚡# Locate hitching rails and corrals away from surface water sources so that manure and urine do not enter the watercourse either directly or indirectly through runoff.
- ⚡# If feasible, water horses away from watercourses and access watercourses only over hardened surfaces, naturally unvegetated or previously disturbed ground.

3.2.5. Cultural Resources

3.2.5.1. Environmental Effects of All Guided Activities – Cultural Resources

Impacts to cultural resources can include damage to a site through vandalism or through removal of artifacts. It is considered extremely unlikely that guided groups are involved in vandalism or removal of artifacts. No report of damage by guided groups has been noted (Glenfield 2002b).

Less intrusive impacts to cultural resources may be incurred by overuse of an area (Glenfield 2002b). Trails may be established to hidden cultural resources and encourage other hikers to the sites. Trampling and vegetation removal at locations containing buried cultural sites could result in the alteration of sediments affecting the contextual integrity of the site. Damage could occur to exposed or shallowly buried artifacts and alter their spatial associations and relationships. This can be a particular problem for fragile objects

such as bone or ceramic. Trampling and vegetation loss can also lead to compaction and hence erosion as there is decrease in pore space and moisture content, reducing the capacity of the soil to absorb moisture. This will naturally increase the potential for runoff and erosion exposing artifacts and damaging site context. Sites situated in areas that contain silts or fine sands would be particularly vulnerable. Log structures can be disturbed through the removal of portions for firewood, carving of names, dates and other messages and tying up horses to the structures. Pictographs can be disturbed by over-painting of names, dates and other messages. Rock features, cairns, and tent rings can be disturbed by removal of rocks from these features.

3.2.5.2. Mitigation for All Guided Activities – Cultural Resources

- ⌘ Educate clients about the value of cultural resources when at a cultural site.
- ⌘ Guides are responsible to ensure that clients do not remove any items from cultural sites nor vandalize the sites.
- ⌘ Guides are responsible to ensure that clients do not deface or write on rocks, outcrops, trees, logs or park infrastructure.
- ⌘ Do not rearrange cairns or add rocks to existing cairns.
- ⌘ Limit foot traffic to hardened trails in the area if cultural sites are exposed as a result of trail braiding or the development of informal trails.
- ⌘ Report the discovery of an artifact or cultural site to Parks Canada – do not remove or otherwise disturb the site.

3.2.6. Visitor Experience

3.2.6.1. Environmental Effects of All Guided Activities – Visitor Experience

According to surveys, the overall satisfaction of independent day users decreased as the number of people encountered increased. Large groups particularly contributed to the feeling of overcrowding (Canada 1995). Some commercial groups may contribute to this problem due to large group sizes (see section 3.1.1). Noise, campfires, garbage and overcrowding at parking lots may also negatively affect the quality of visitor experience.

The visitor experience, for many people, may be enhanced by commercial guiding activities. People who might not go exploring on their own, may be willing and enthusiastic to take part in commercial guided activities in the national parks. Commercial guided activities take people into areas of the park that they might not explore on their own. They also provide interpretation and education about the surrounding ecosystem, enforce mitigation, and may increase the knowledge and respect that people have for the park.

3.2.6.2. Mitigation for All Guided Activities – Visitor Experience

Large commercially guided groups may have a negative effect on the perception of the environment and the visitor experience of other park users. Crowding and noise at rest stops and viewpoints may affect the aesthetic experience and feelings of solitude and remoteness that many backcountry visitors seek.

- ⌘ Operators shall comply with group size restrictions as per business licence stipulations, zoning and area management restrictions. Multiple groups must be separated by a minimum of 500 metres.

- ⚡ Guided groups do not have precedence over other groups. Guides shall act in a courteous manner towards other user groups on the trail and concede the right of way to smaller groups.
- ⚡ Where environmental impacts can be mitigated, guides should seek group consolidation, solitude and separation from other park users or groups at rest stops, viewpoints and campsites.
- ⚡ Guided groups should travel as a group within calling distance from the front to the back of the group. Guided groups should attempt to keep noise to a minimum.
- ⚡ Where feasible operators should try to minimize overcrowding by scheduling departure dates and times that avoid high use times. Guides should minimize overcrowding by managing the amount of time spent at high use sites.
- ⚡ Guides should pick up garbage and take reasonable measures to restore impacted sites that are encountered during the course of an excursion.
- ⚡ When requested, or when a perceived need arises, guides are expected to pass environmental management or interpretive information on to non-guided groups and to offer emergency or other assistance to non-guided groups when needed.

Campfire use can affect the experience of other visitors:

- ⚡ Guides should use dry seasoned wood that burns cleanly to limit the amount of smoke from campfires.
- ⚡ Guides shall refrain from burning food or garbage such as plastics that produces odours and harmful emissions. Partially burned items are not to be left in fire pits.
- ⚡ Campfires shall be kept small and noise around the campfire shall be minimized in campsites shared with other users.

Vehicle use can negatively affect the visitor experience:

- ⚡ Operators shall encourage car-pooling or provide shuttle van pick-ups for clients when possible to reduce pollution and vehicle congestion at trailheads.
- ⚡ Operators shall make use of existing shuttle services where they exist.
- ⚡ Operator vehicles shall be in good running order.
- ⚡ Operators and guides shall minimize idling of vehicles at trailheads and pullouts.

3.2.6.3. Environmental Effects of Specific Activities – Visitor Experience

Mountaineering

When climbing in some areas (e.g. on big walls), finding environmentally friendly means of disposing of feces becomes a challenge. It cannot be buried where no soil exists and would be offensive if left along the route. As well, specialized protective equipment is frequently left behind or permanently installed for safety precautions. This equipment detracts from the natural beauty of the environment.

Horses

Other user groups may find the presence, smells, horse flies and associated waste products of horse groups a detraction both along the trail and at the campsites (Parks Canada 2002b).

3.2.6.4. Mitigation for Specific Activities – Visitor Experience

Mountaineering

- ⌘ Pack out feces from locations where proper disposal is not possible (e.g. glaciers, snowfields, big walls).
- ⌘ Use natural or removable protection equipment whenever possible.
- ⌘ Within the bounds of safety, guides shall minimise the amount of gear left behind at anchor or rappel stations.
- ⌘ When gear is to be left behind use dull or appropriately coloured bolt hangers, slings, or other gear.
- ⌘ Where possible and safe, guides should place anchors discretely at the top of routes.
- ⌘ Use slings to protect trees used for anchors.

Horses

- ⌘ Break up and spread manure at staging areas and campsites to facilitate drying and dissipation of smells.
- ⌘ Respect trails that are off-limits to horse use.

Winter

Guides shall ensure that groups move well off main trail or away from stopping areas for bathroom breaks. Latrine areas should be located in sites not likely to be traveled through by others, well away from water bodies and buried deeply when leaving.

3.2.7. Effects of Malfunctions or Accidents; Effects of Environment on Project; Effects of Changes to the Environment on Socio/Economic Conditions

3.2.7.1. Effects of Environment on All Guided Activities

Guided recreational activities in the Canadian Rocky Mountains have seen substantial growth within the last 5 years (Glenfield 2002b). Medical injuries and illness, aggressive wildlife encounters, group separation and lost people, and weather related emergencies are public safety issues caused in part by environmental factors that may arise related to any guiding activity. Rugged terrain, difficult weather conditions and remote locations may compound the severity of public safety incidents and the difficulty of search and rescue efforts.

Guide training standards and certification requirements, including first aid certification, have been standardized by the mountain parks and are attached as conditions of the business licences. Guide/client ratios and other public safety requirements are also included as business licence stipulations. Parks Canada has a staff team dedicated to the identification and management of public safety issues. No additional mitigation is identified or required as part of this environmental assessment to address public safety concerns. However, guides and operators are responsible to ensure they operate in accordance with the standards and certification requirements identified in their business licence. Guides and operators are also responsible to ensure that guided groups have the appropriate safety equipment for the activity in question.

3.2.7.2. Malfunctions or Accidents

Accidental wildfire, snow avalanches, and inadvertent direct injury or damage to vegetation and wildlife may result from the activities of commercial operators.

While not likely to occur, wildfire may occur as a result of an escaped or poorly extinguished campfire. An uncontrolled wildfire may have adverse impacts, primarily to wildlife, humans and built infrastructure. Parks Canada has dedicated equipment and staff, and fire management plans to deal with accidental wildfires and most wildfires are put out quickly.

Snow avalanches are natural disturbance events and the potential impacts are primarily related to public safety. Parks Canada public safety staff manage avalanche hazard through direct control, area closures and avalanche safety information systems.

Given the control and management measures already in place related to potential wildfire and snow avalanches, no additional mitigation is identified or required as part of this environmental assessment to address the potential environmental impacts of accidental wildfire or avalanche. However, guides and operators are responsible to ensure they operate in accordance with the standards and certification requirements identified in their business licence. Guides and operators are also responsible to ensure that guided groups have the appropriate safety equipment for the activity in question.

Direct injury to wildlife or damage to vegetation may occur as a result of human use, especially in off-trail situations. Potential direct injury to wildlife is unlikely but possible e.g., ground nesting birds. Damage to sensitive vegetation such as unknown locations of rare plants is also unlikely but still possible. Given the standard activity-specific mitigation, it is expected that these types of occurrences would be infrequent and very limited in scale. No additional mitigation is identified or required as part of this environmental assessment to address the potential impacts of direct injury to sensitive vegetation or wildlife.

3.2.7.3. Effects of Changes to the Environment on Socio-Economic Conditions

Commercially guided activities contribute to the economy through employment, either directly or indirectly, accommodation for employees, and local purchases of supplies, equipment and support services. Most companies are local and only a few are based outside of Western Canada. The existing licenced guided hiking companies employ one to 35 guides each, the average being eight guides. In the winter the number of people employed decreases (in Jasper the average is 3 to 4 guides for winter operating companies, the total number of employees in Banff employed by these activities drops by 60%).

Impacts to the natural environment as a result of land-based guiding activities are not expected to: negatively affect the demand for guiding services; affect the type or scope of other visitor services; affect the level of visitation by independent users; or affect the livelihood of people in or around the parks. No additional mitigation is identified or

required as part of this environmental assessment to address the potential impacts of changes to the environment on socio-economic conditions in or around the Parks.

3.3. Site-Specific Analysis for All Activities

The discussion of site-specific environmental sensitivities is organized by park and subdivided by site. Ecologically sensitive features are identified and mitigations outlined for each sensitive site as appropriate.

3.3.1. Introduction

Sensitive sites are evaluated in this section to identify unique environmental characteristics and issues that may not be adequately addressed through the implementation of standard activity-specific mitigation. Site-specific mitigation measures were identified to mitigate for sensitive environmental features described at each site. In Appendix 2 site-specific mitigation measures were developed into “best management practices” (BMPs) to be used by guides when conducting commercial operations.

Sensitive sites were identified and described in Section 2 by referring to management plans, ecological land classification information, and through consultation with Park Canada Field Unit staff. A landscape level GIS analysis was used to provide an additional, objective verification of vulnerable areas as identified by parks staff, and to identify additional areas of concern. The vulnerability analysis utilized existing data sets and overlaid landscape parameters reflecting human use stress on wildlife, sensitivity of vegetation communities, significant ecological features, management purpose and levels of human use. The geographic output of the analysis identifies areas considered to be vulnerable to the potential impacts of commercial guiding activities when combined with other human uses (Appendix 3).

Site-specific mitigation measures were developed in consultation with Field Unit staff. Mitigating measures for all sensitive sites are included as standard terms and conditions attached to every business licence. Site-specific mitigations were not identified for every sensitive site. For some sites, direction provided in Park management plans was considered adequate to mitigate the potential environmental impacts of commercial guiding activities and no additional mitigation was considered necessary. For other sensitive areas, no site-specific mitigating measures were identified as part of the MCSR, but the site was identified for further evaluation of additional and cumulative environmental effects through the CSPR process.

3.3.2. Banff – Site-Specific Environmental Effects and Mitigation

Clearwater/Siffleur, Flints Park, Bryant Creek Areas

The draft Human Use Strategy for Banff National Park restricts the expansion of commercial use in these sensitive wildlife areas. In addition, each of these areas is located in relatively remote regions of the park. Overall increases in use are expected to be minimal. No additional mitigation beyond direction provided in the draft Human Use

Strategy is considered necessary in order to address potential impacts of commercial activities in these areas.

Skoki/Baker Creek Area

The draft Human Use Strategy for Banff National Park effectively restricts the expansion of commercial use in this sensitive wildlife area by managing overall human use at low to moderate levels. This general area has been identified as one of Banff National Park's primary grizzly bear reproductive "engines" and is identified as an area of concern through the vulnerability analysis conducted for the MCSR. The draft Human Use Strategy identifies a number of management actions aimed at reducing human/bear conflicts in these areas. Management actions are already being implemented to manage for lower levels of human use in the Baker Creek LMU. The Skoki Valley area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-12). While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Cave and Basin Marsh Zone I Area and Vermillion Lake Wetlands

Despite being classified as a Zone I area, the Cave and Basin site often receives in excess of 10 000 visitors monthly in the summer. Guided hiking is limited to the Marsh Loop trail in the Cave and Basin Marsh Zone I area. The trail crosses habitat for the endangered Banff Springs snail and other aquatic life that flourishes in the warm spring water of the marsh. The snail has very specific habitat requirements and small changes in habitat parameters may have unknown or disastrous results for snail populations.

When operating in the Vermillion Lake Wetlands or the Cave and Basin Marsh areas guides shall:

- ⌘ Restrict all activities to established trails, boardwalks, viewpoints and rest areas.
- ⌘ Ensure that clients do not place hands and feet into the water or disturb aquatic vegetation and wildlife in any manner
- ⌘ Ensure that clients do not introduce foreign substances or chemicals to the water as small changes may negatively affect habitat parameters.

Castleguard Cave and Meadows

Access to Castleguard Cave is by special permit only. The Castleguard area is remote and receives low use. No additional mitigation has been identified or is considered necessary to address potential impacts of commercial activities in the Castleguard area.

Middle Springs

Middle Springs and the Middle Springs wildlife corridor is closed to all public and commercial access. No additional mitigation is considered necessary to address potential impacts of commercial activities in the Middle Springs area.

Fairholme/Carrot Creek ESS

The Fairholme/Carrot Creek area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-7). Trails and facilities in this

area have been decommissioned by Parks Canada and a voluntary closure is in place. Mountaineering access to Mt Peechee via Carrot Creek is expected to be limited.

- ⚡ Operators shall refrain from promoting or booking any regularly scheduled excursions into this area.
- ⚡ Mountain guides are discouraged from using the Carrot Creek rockclimbing area.

Johnson Lake

Johnson Lake is a very popular day use area for hiking, sunbathing, swimming, canoeing and fishing. Commercial day use activity has increased in this area over the last several years. There are several sensitive sites in and around Johnson Lake that require additional mitigation. Muskrat Bay is a sensitive area for spawning rainbow trout and nesting waterfowl, particularly loons. The Beaver Pond wetlands to the north of the lake are also a sensitive site for nesting waterfowl. A wolf den is located not far from the east end of the lake. A historic cabin site is located off the main trail off the south shore of the lake. Heavy human use has resulted in damage to vegetation and the establishment of many informal trails especially along the south shoreline.

Operators and guides operating in the Johnson Lake area shall:

- ⚡ Avoid approaching the shoreline of Muskrat Bay, the adjacent inflow stream, or the beaver pond wetlands during waterfowl nesting season May 1 – June 30.
- ⚡ Avoid all off-trail travel along the north and northeast shoreline
- ⚡ Avoid the wolf denning site at all seasons and times.

The Johnson Lake area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-7). Although specific mitigations are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Lake Louise Area

Most travel in the Lake Louise area is on well-established trails with hardened surfaces and the area is managed by Parks Canada for high levels of visitor use. Operators are asked to use van shuttles, organize car pools or utilize public transportation where available to reduce vehicle congestion at parking lots.

The “back of the lake” rockclimbing area has become increasingly popular over the last several years and impacts from climbers in this area include the establishment of informal trails, the placement of permanent anchors, and an increase in human waste. Guides using the back of the lake should take great care to minimize their impacts through diligent application of the standard best management practices as well as:

- ⚡ Guides shall encourage clients to use washroom facilities before leaving the parking areas to reduce pressure on facilities at the back of the lake.
- ⚡ Guides shall ensure that clients use outhouse facilities provided at the back of the lake. The use of catholes or other waste disposal methods are not appropriate or acceptable at this site.

Paradise Valley/ Moraine Lake Valley

The Paradise Valley and Moraine Lake Valley (including the Consolation Lakes, Larch Valley and Eiffel Lake areas) located within the Lake Louise LMU function as important grizzly bear habitat. Bears in this area grow up in relatively close contact with humans and preventing habituation of bears is a continual management challenge. Additional mitigation in these areas for commercial guides is consistent with that applied to other users and is focused on minimising habituation and the potential for bear/human encounters.

Operators and Guides are expected to:

- ⚡ Comply with minimum group size restrictions as applicable.
- ⚡ Use the existing backcountry campground in Paradise valley and adjust climbing or hiking schedules as appropriate as opposed to utilizing bivouacs.
- ⚡ Use van shuttles, organize car pools or utilize public transportation where available to reduce vehicle congestion at parking lots.

The Paradise Valley/ Moraine Lake Valley area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-12). New and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Tunnel Mountain

The most significant ecological features in the Tunnel Mountain area subject to the impacts of commercial use are the hoodoos. These features are not durable and are prone to erosion. Guides using the Tunnel Mountain area should take great care to minimize their impacts to vegetation and soils through diligent application of the standard best management practices as well as:

- ⚡ Guides shall restrict their groups to established trails and viewpoints in the hoodoos area. Off trail travel or activity is not appropriate or acceptable at the hoodoo sites.

Pipestone/Upper Bow LMUs

The Pipestone LMU and the upper reaches of the Bow River drainage within the Upper Bow LMU are important habitat areas for grizzly bear and woodland caribou. The draft Human Use Strategy for Banff National Park restricts the expansion of commercial use in designated wildland areas within these LMUs. Overall increases in human use within the wildland areas are expected to be minimal. No additional mitigation beyond direction provided in the draft Human Use Strategy is considered necessary in order to address potential impacts of commercial activities on wildland areas within these LMUs.

Helen Lake, Dolomite Pass and North Molar Pass areas in the Pipestone and Upper Bow LMUs are designated as primitive under the draft Human Use Strategy for Banff National Park but feature relatively easy access to expansive alpine and subalpine environments and are popular destinations for both day and overnight users. High in elevation, the spring is late and summer season is short at these sites, with the result that vegetation and soils are often wet and prone to damage. Grizzly bear populations in these areas along with the adjacent Bow Summit area appear to be on the rise and bear/human encounters have recently become more frequent. Mosquito Creek and South Molar pass are also

easily accessible and have been the locations of recent caribou observations. When using these areas:

- š Guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
- š Operators shall schedule trips to these areas so as to avoid wet spring and early summer seasons and conditions.
- š Where feasible operators should plan excursions for a minimum group size of six or more to reduce the potential for an aggressive bear encounter. Guides shall ensure that clients travel as a group for the same reason.

The areas of the Pipestone LMU designated as “primitive” under the draft Human Use Strategy for Banff National Park including Helen Lake, Dolomite Pass, North and South Molar Pass, and Mosquito Creek areas are identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-13). While specific mitigations are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Wildlife Corridors

A number of mountain passes have been identified as important wildlife corridors. Low elevation passes including Vermillion, Howse, Kicking Horse and Thompson passes have been identified as being important for the movement of wildlife in general; especially for large, wide ranging carnivores. Other mountain passes have been identified as potentially important corridors for caribou immigration as well as mountain goat habitat including Sunset and Nigel passes. Wildlife corridors around the Town of Banff and the Village at Lake Louise are particularly important for the movement of grizzly bears and wolves as well as other wildlife species.

Area management plans for the Town of Banff and Lake Louise Village address concerns with respect to the management of wildlife corridors around these highly used areas. The draft Human Use Strategy for Banff National Park restricts the expansion of commercial use through Howse and Thompson passes through the wildland designation. In addition, each of these passes is located in relatively remote regions of the park and overall increases in use are expected to be minimal. No additional mitigation beyond direction provided in the draft Human Use Strategy or in the management plans for the Town of Banff and Lake Louise is considered necessary in order to address potential impacts of commercial activities on these wildlife corridors.

Sunset and Nigel passes are designated as Primitive under the draft Human Use strategy for Banff National Park, effectively restricting overall use to low levels. Vermillion and Kicking Horse passes fall into both semi-primitive and front-country designations allowing for moderate to high levels of use. New and expanded business licence applications for Vermillion and Kicking Horse passes will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Other Sensitive Sites

Commercial activity related to use of the Sunshine Meadows area is not included within the scope of the Model Class Screening. Operation of the vehicle shuttle using the Sunshine ski hill road and summer hiking activities, including commercial activities, will be addressed in the long range management plans and associated environmental assessment for the ski hill operation.

No unique site-specific concerns that would require the implementation of mitigation measures beyond the standard best management practices were identified for other sensitive ecological or cultural sites in Banff National Park. It is expected that the implementation of best management practices by guides and outfitters, in combination with overall human use management objectives implemented by Parks Canada, will effectively address the potential environmental impacts associated with commercial operations at other sites and in other areas of the park

3.3.3. Jasper – Site-Specific Environmental Effects and Mitigation

Edith Cavell Meadows ESS

Parks Canada is actively involved in managing human use impacts in this popular day hiking area. Management actions include: closing the meadow as required to protect caribou rutting grounds in the fall and to reduce damage to vegetation from human use in the wet conditions of early spring; re-routeing trails as necessary to help protect the area's rare plant population; detailed rare plant surveys to determine the location, extent, and status of these populations; and closure of informal trails and paths (Parks Canada 2000a). These measures are expected to address the main issues related to human use impacts in the meadows. Guides and operators should contribute to minimizing impacts in the meadows area.

- ⚡ Operators should avoid promoting or scheduling trips for wet spring and early summer seasons or similar conditions.
- ⚡ Guides shall limit travel in the meadows (i.e., all areas at and below the upper loop) to established formal trails and established rest stops.
- ⚡ Guides shall restrict off trail travel and rest stops above the upper loop to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
- ⚡ Guides shall encourage clients to use washroom facilities before leaving the parking lot. The use of catholes or other waste disposal methods are not appropriate or acceptable in Cavell Meadows. Guides shall ensure that all solid human waste is packed out.
- ⚡ Mountain guides accessing the East Ridge of Mt Edith Cavell from Cavell Meadows trail shall use the same established route for each trip and limit the number of different paths or trails used.

The Edith Cavell Meadows area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-17). While specific mitigations are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Maligne Lake Outlet ESS

Parks Canada is actively involved in management of human use impacts to preserve this sensitive site. Management actions include; closing the outlet to all use during May and June to protect the harlequin duck “club site”; closing the mid-Maligne River to in-stream use; rehabilitating the riparian willow and upland vegetation communities in the outlet area; restricting access to specific locations until restoration is complete; and improving the presentation of the site’s significance (Parks Canada 2000a). No additional mitigation has been identified in order to manage the potential impacts of commercial guiding use. While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Tonquin Valley Area

Parks Canada is actively involved in the management of human use impacts in the Tonquin Valley and surrounding areas. Management actions include: prohibiting development of designated trails in Moat Pass, Tonquin Pass, Vista Pass and Meadow Creek in recognition of their role as critical movement corridors for grizzly bears, and; determining the impact of horseback day trips in the Clitheroe and Majestic areas and the need for additional standards, monitoring, designated trails, or possible closures. In the interim operators and guides should attempt to minimize potential environmental impacts through diligent application of the standard best management practices. In addition to the best management practices, guides and operators using the Tonquin Valley area should implement the following practices to minimize impacts to vegetation and wildlife:

- ⌘ Guides should minimize human disturbance of caribou during calving and rutting periods and avoid caribou during the winter season.
- ⌘ Operators should avoid promoting or scheduling trips for wet spring and early summer seasons or similar conditions.
- ⌘ In the Amethyst Lakes area guides shall limit travel in the meadows wherever possible to established formal or informal trails and previously disturbed sites.
- ⌘ In the Amethyst Lakes area guides should endeavour to use the same established routes for each trip and limit the number of different paths or trails used.

The Tonquin Valley area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-17). New and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process. This will enable Parks staff to consider potential impacts to grizzly bear, caribou, lynx and wolverine on the basis of specific proposals.

Wilcox Pass

Mitigation for the Wilcox Pass area focuses on preventing impacts to sensitive alpine vegetation. In addition to standard best management practices commercial operators should implement the following procedures:

- ⌘ Operators should avoid promoting or scheduling trips for the wet spring and early summer seasons or similar conditions.
- ⌘ Where feasible, guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.

- ⚡ Guides should endeavour to use the same established routes for each trip and limit the number of different paths or trails used.

Due to the uncertainty associated with the level of commercial use, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Opal Hills/ Bald Hills

Mitigation for the Opal Hills and Bald Hills areas focuses on preventing impacts to sensitive alpine vegetation and reducing aesthetic impacts at trail summits and viewpoints. In addition to standard best management practices commercial operators should implement the following procedures:

- ⚡ Operators should avoid promoting or scheduling trips for the wet spring and early summer seasons.
- ⚡ Guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
- ⚡ Guides should endeavour to use the same established routes for each trip and limit the number of different paths or trails used.
- ⚡ Guides shall schedule bathroom breaks prior to arriving at trail summits or viewpoints.
- ⚡ Guides shall ensure that toilet paper and other human waste products are packed out and removed from trail summit areas.

While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Skyline Area

The Skyline area is a high area of extensive alpine and subalpine meadows popular with backpackers and is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-17). Although no specific environmental issues have been identified by Parks Canada, due to the uncertainty associated with the level of commercial use, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Surprise Valley Zone 1 Area

No horse use is allowed in this area because the karst landforms are sensitive to impacts from trampling.

Other Sensitive Sites

No unique site-specific concerns that would require the implementation of mitigation measures beyond the standard best management practices were identified for other sensitive ecological or cultural sites in Jasper National Park (Pocahontas Ponds ESS, Ancient Forest Zone I Area, Surprise Valley Zone I Area, Three Valley confluence, montane Ecoregion, cultural sites). It is expected that the implementation of best management practices by guides and outfitters, in combination with overall human use

management objectives implemented by Parks Canada, will effectively address the potential environmental impacts associated with commercial operations at other sites and in other areas of the park

3.3.4. Kootenay – Site-Specific Environmental Effects and Mitigation

Burgess Shale Outcrops Zone 1 Areas

The Burgess Shales Outcrops Zone 1 areas in Kootenay are relatively remote and for the most part have very low levels of incidental human use at this time. The following mitigation will apply to guides working in the Burgess Shales area:

- ⌘ Commercial guides shall avoid taking trips through remote Zone 1 Special Preservation areas
- ⌘ Commercial guides shall educate clients on the palaeontological values of the Burgess Shale and why some areas have been designated as Special Preservation areas
- ⌘ Commercial guides shall report any incidental fossil finds
- ⌘ Commercial guides must not permit any removal of fossils from these sites.
- ⌘ Commercial guides should respect any fossil conservation zones designated by Parks Canada (Parks Canada 2000b).

Ice River Zone 1 Areas

This site contains a significant intrusive igneous complex that is exceedingly rare in the Canadian Rocky Mountains. Collection of igneous rock samples would constitute an unacceptable negative impact to the area. The Ice River Zone 1 area in Kootenay is relatively remote and sees only low levels of incidental human use at this time.

- ⌘ Commercial guides shall educate clients on the cultural and historic values of this Special Preservation area.
- ⌘ Commercial guides must not permit the collection of rocks or other materials from the site.

Wolverine Pass ESS/Tumbling Creek Valley

The Wolverine Pass ESS/Tumbling Creek Valley area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-3). While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process. This will enable Parks staff to consider potential impacts to grizzly bear, lynx and wolverine habitat on the basis of specific proposals.

Kindersley Summit

The Kindersley summit area is important spring and summer habitat for Bighorn sheep and for Grizzly Bears. Mitigation for this area focuses on reducing disturbance to Bighorn Sheep and on reducing the potential for human/bear encounters.

- ⌘ Operators shall avoid promoting or scheduling trips until after June 15 to avoid the sensitive lambing season
- ⌘ Guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.

- ⚡ Guides shall schedule bathroom breaks prior to arriving at trail summits or viewpoints.
- ⚡ Guides shall ensure that toilet paper and other human waste products are packed out and removed from trail summit areas
- ⚡ Where feasible operators should plan excursions for a minimum group size of six or more to reduce the potential for an aggressive bear encounter. Guides shall ensure that clients travel as a group for the same reason.

Although specific mitigations are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process. This will enable Parks staff to consider potential impacts to vegetation, wildlife and wildlife habitat on the basis of specific proposals.

Kootenay River Valley Bottom

Populations of mule deer, elk, and wolves in this important valley bottom montane habitat are currently low. These populations may be stressed by increased human use, especially during the winter season. While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process. This will enable Parks staff to consider potential impacts elk, deer and wolf habitat on the basis of specific proposals.

Kaufmann Lake Archaeological Sites

Parks Canada cultural resource specialists have recommended that the trail approaching Kaufmann Lake be hard surfaced with gravel/clay, from the summit of the switchbacks to the tent area, and that the tent areas be hard surfaced to cap the archaeological materials in this area. This management action will reduce the potential effects of erosion at this sensitive site. No additional mitigation for commercial operators beyond the implementation of best management practices with respect to cultural and historical resources is considered necessary to protect resources at this site.

Other Sensitive Sites

No unique site-specific concerns that would require the implementation of mitigation measures beyond the standard best management practices were identified for other sensitive ecological or cultural sites in Kootenay National Park (Mt. Wardle and Mt. Verendrye Zone I Area, Sora and Sundew Pond ESS, Moonwart ESS, Wardle Flats ESS, Dry Gulch ESS, and other cultural sites). It is expected that the implementation of best management practices by guides and outfitters, in combination with overall human use management objectives implemented by Parks Canada, will effectively address the potential environmental impacts associated with commercial operations at other sites and in other areas of the park

3.3.5. Yoho – Site-Specific Environmental Effects and Mitigation

Burgess Shale Zone I Area

Commercial guiding licences for the well-known Burgess Shale sites on Mt. Stephen and Mt. Field are limited to a single licence. Quotas and conditions are set out in the

agreement with the Yoho-Burgess Shale Foundation. In addition to any business licence conditions or stipulations the following mitigation will apply to guides working in the Burgess Shales area:

- ⚡ Commercial guides shall avoid taking trips through remote Zone 1 Special Preservation areas
- ⚡ Commercial guides shall educate clients on the palaeontological values of the Burgess Shale and why some areas have been designated as Special Preservation areas
- ⚡ Commercial guides shall report any incidental fossil finds
- ⚡ Commercial guides must not permit any removal of fossils from these sites.
- ⚡ Commercial guides should respect any fossil conservation zones designated by Parks Canada (Parks Canada 2000b).

Ice River Igneous Complex Zone I Area

This site contains a significant intrusive igneous complex that is exceedingly rare in the Canadian Rocky Mountains. Erosional impacts from trail hikers on the Ice River trail would likely be insignificant, but collection of igneous rock samples would constitute an unacceptable negative impact to the area.

- ⚡ Commercial guides shall educate clients on the cultural and historic values of this Special Preservation area.
- ⚡ Commercial guides must not permit the collection of rocks or other materials from the site.

The Ice River Igneous Complex is identified as an area of concern through the vulnerability analysis conducted for the MCSR. While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process. This will enable Parks staff to consider potential impacts to geologic resources on the basis of specific proposals.

Ottertail River Flats ESS

- ⚡ Commercial guides must follow Parks Canada directions in focusing use on the existing Otterhead Trail and discontinuing use of the Van Horne trail beyond Otterhead Bridge (Parks Canada 2000b).

Kicking Horse Pass

Sherbrooke Lake and Paget Lookout transect the west side of the Kicking Horse Pass north of the Trans Canada Highway. Kicking Horse Pass serves as an important wildlife corridor for grizzlies, wolves and wolverine.

While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process. This will enable Parks staff to consider potential impacts to wildlife habitat and movement on the basis of specific proposals.

Emerald Lake Vegetation ESS, Hamilton Lake, Otterhead River/Porcupine Creek/, Amiskwi River Valleys

While no specific sensitivities or mitigation are identified as part of the MCSR, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process. This will enable Parks staff to consider potential impacts to vegetation and wildlife habitat on the basis of specific proposals.

Other Sensitive Sites

No unique site-specific concerns that would require the implementation of mitigation measures beyond the standard best management practices were identified for other sensitive ecological or cultural sites in Yoho National Park (Leancoil Marsh ESS, Wapta Marsh ESS, identified wildlife corridors, and other cultural sites). It is expected that the implementation of best management practices by guides and outfitters, in combination with overall human use management objectives implemented by Parks Canada, will effectively address the potential environmental impacts associated with commercial operations at other sites and in other areas of the park.

3.3.6. Waterton – Site-Specific Environmental Effects and Mitigation

Maskinonge Wetlands Zone I Area

≠# Guides shall limit activities to developed areas and not extend activities along the wetland shores or into the back wetland areas.

Festuca/Danthonia Grassland ESS

Parks Canada is actively involved in the management of human use impacts to protect this site including: reducing or eliminating the impact of the trade waste pit; actively managing vegetation and stands of vulnerable species; and actively promoting research into restoration techniques for native fescue grassland. No unique site-specific concerns that would require the implementation of mitigation measures beyond the standard best management practices were identified for this grasslands area.

Upper Crooked Creek (Sofa) wetlands

There are no designated trails in this area. Commercial guiding activities and overnight use is prohibited.

Lower Blakiston Creek wetlands

Few hikers use this area, but a bike and horse trail runs near the wetlands. The area is very heavily used by black bears and grizzly bears. While no specific mitigations are recommended for commercial operators, new and expanded business licence applications for this area will be reviewed in detail through the CSPR process for cumulative effects. This will enable Parks staff to consider potential impacts to vegetation and wildlife habitat on the basis of specific proposals.

Summit Lake-Carthew Lakes

Trail braiding and associated impacts are beginning to occur at various locations along this highly used trail.

- ⚡ Operators should avoid promoting or scheduling trips for wet spring and early summer seasons or similar conditions.
- ⚡ Guides shall limit activities to established formal trails, rest stops and routes.

Lineham Lake

This area is very difficult to access and it will not likely be a day use destination for most guided activity. Lineham Lake is currently managed to control the impacts of human use. The lake area is designated for random camping though the total numbers are strictly controlled within the existing operation guidelines (up to 12 people will be permitted to camp in the basin at any one time with group size limited to 6). These restrictions will also apply to commercial operators. New and expanded business licence applications for the Lineham Lake will be reviewed in detail through the CSPR process for additional site-specific and cumulative effects. This will enable Parks staff to consider potential impacts to geologic resources on the basis of specific proposals.

3.3.7. Mount Revelstoke and Glacier – Site-Specific Environmental Effects and Mitigation

Nakimu Caves-Cougar Valley Zone I Area

The natural features of Nakimu Caves and the premier grizzly habitat in Cougar Valley are protected by limiting access to the caves to a route over Balu Pass. Limiting access to the Balu Pass route also reduces the public safety hazard posed by grizzly bear activity in the Cougar Valley. Access through the lower Cougar Valley is not permitted during the summer season to protect bear habitat and during the winter the area is closed for avalanche control.

- ⚡ Commercial guides must respect closures implemented by Parks Canada.

Glacier House Cultural Site

- ⚡ Commercial guides must ensure clients stay on designated paths and use designated stopping areas to protect archaeological and cultural resources at the site.

3.4. Residual Effects and Significance

This section evaluates the significance of negative environmental effects of a single project under the MCSR. As described in 1.7.4, ecological effects are considered significant if they threaten the continued existence of native species or biological communities. Effects to cultural resources are considered significant if the integrity or use of the resource is compromised by project activities. Effects to visitor experience are considered significant if overall visitor satisfaction would be decreased as a result of project activities.

Positive residual effects from commercial guided activities include the education and increased respect for environmental and cultural resources that clients gain from their guide. As a result of guide influence, clients are more likely to follow practices designed to mitigate negative environmental effects. Clients may also experience new activities in new locations that they would not experience on their own. The influence of professional

guides in many cases is expected to result in improved resource protection and enhanced visitor safety and experience.

The criteria of magnitude, geographic extent, duration, frequency, and reversibility are used to evaluate the significance of potential negative environmental impacts (see Table 1 for definitions). Each VEC is evaluated for the significance of residual effects after mitigation with the results summarized in Table 4. It should be noted that this section of the MCSR evaluates the significance of impacts that are likely to occur as a result of a single commercial operation. The cumulative impacts are evaluated separately through the CSPR and Business Licencing review process (see Section 3.5.).

Wildlife

The impacts of individual commercial guiding operations to wolves and grizzly bears is expected to be limited in geographic extent, duration, and frequency. Human/wildlife encounters are likely to result in disturbance level impacts only. The activities of individual commercial guiding operations are not likely to threaten the continued existence of grizzlies or wolves in any location in the mountain parks.

The direct impacts of individual commercial guiding operations to wolverines, caribou, and lynx in the summer and winter months are expected to be very infrequent and of very limited duration, resulting in minor disturbance level impacts. In the winter, indirect residual impacts caused by increased competition and predation as a result of ski and snowshoe tracks may not be reversed without considerable new snowfall. Low elevation winter activities potentially affecting these species are however limited in number and geographic scope for a single operator. The activities of individual commercial guiding operations are not likely to threaten the continued existence of wolverine, lynx or caribou in any location in the mountain parks.

Wildlife species other than the sensitive species mentioned above may be impacted more frequently by a given commercial guiding operation. Individual operations are not likely to cause significant impacts to other species of wildlife as the geographic extent, magnitude and duration of the impacts are unlikely to threaten the continued existence of a wildlife species in any given area. Most human/wildlife encounters are expected to result in disturbance level impacts. The activities of individual commercial guiding operations are not considered to be likely to threaten the continued existence of wildlife species in any location in the mountain parks.

Soils and Vegetation

The impacts of individual commercial guiding operations to vegetation and soils are expected to be quite localized around areas of high use, and to result in disturbance or damage level impacts that may be considered to be reversible over time with vegetation re-growth. Impacts may occur relatively frequently for companies offering regular trips to the same locations. However, as the impacts of individual commercial guiding operations to vegetation and soils are quite limited in geographic extent, they are not likely to threaten the existence of native vegetation populations and as a result not likely to result in significant impacts to native vegetation.

The potential introduction and spread of new non–native plant species that have not already been introduced to the mountain parks as a result of commercial guiding activities is considered unlikely after implementation of the standard mitigation measures. The activity with the most potential for spreading non-native species, horse outfitting, is restricted in geographic scope through the licencing process to historical trails and sites. Reversing the effects related to the introduction of an invasive species may require active management over a significant period of time and may never be completely successful. Given the implementation of the standard mitigation, and invasive species control measures already put in place by Parks Canada, individual commercial guiding activities are unlikely to result in an introduction, or a further spread, of invasive species that would threaten the existence of native plant communities.

Water Quality

Given the implementation of standard mitigation measures, it is not expected that the impacts of individual commercial guiding operations will have any measurable or residual effects on water quality.

Cultural Resources

Given the implementation of standard mitigation measures it is not expected that the impacts of individual commercial guiding operations will result in residual effects on the integrity or context of cultural resources or sites.

Visitor Experience

Given the implementation of standard mitigation measures, the impacts of individual commercial guiding operations are not likely to cause significant adverse impacts to levels of visitor satisfaction. Interactions between commercial groups and any given independent user are expected to be short in duration, infrequent and relatively minor in nature.

Accidents and Malfunctions

Given the implementation of standard mitigation measures, and management measures already put in place by Parks Canada, it is not likely that individual commercial guiding operations will result in accidents that will have significant effects on ecological or cultural resources or on visitor safety and experience.

Table 4. Evaluation of the significance of adverse residual impacts on VECs before consideration of cumulative effects (Neg. means negligible, N/A means not applicable).

VEC	Aspect	Geographic Extent	Duration	Frequency	Reversibility	Magnitude	Significance
Wildlife	Grizzlies	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant
	Lynx	Neg.	Neg.	Neg.	Minor	Neg.	Not Significant
	Wolverines	Neg.	Neg.	Neg.	Minor	Neg.	Not Significant
	Wolves	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant
	Caribou	Neg.	Neg.	Neg.	Minor	Neg.	Not Significant
	Other Wildlife	Neg.	Neg.	Minor	Neg.	Neg.	Not Significant
Vegetation & Soils	Native Vegetation	Neg.	Neg.	Minor	Minor	Minor	Not Significant
	Non-native Vegetation	Neg.	N/A	Neg.	Considerable	Neg.	Not Significant
	Soils	Neg.	Neg.	Minor	Neg.	Neg.	Not Significant
Water Quality	--	Neg.	Neg.	Minor	Neg.	Neg.	Not Significant
Cultural Resources	--	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant
Visitor Experience	Visitor Satisfaction	Neg.	Neg.	Neg.	N/A	Neg.	Not Significant
Accidents & Malfunctions	--	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant

3.5. Cumulative Environmental Effects

Cumulative impacts can occur when more than one project affects an ecological component. These cumulative stresses can be from multiple projects within the park or from projects around the park or a combination of these. Cumulative impacts can be a concern for the following reasons:

- ⌘ the combined impact of multiple actions on an ecosystem can be greater than the sum of the individual impacts of each action;
- ⌘ activities can occur close together in time and/or space so that effects overlap and/or recovery is more difficult;
- ⌘ the incremental effect of multiple actions can detrimentally affect the ecosystem (also called the “nibbling effect”); and,
- ⌘ ecosystem responses can include time lags, space lags, thresholds of ecosystem tolerance and indirect effects that make predictions difficult.

Park management plans are considered by Parks Canada to be the appropriate mechanism for the identification and management of cumulative environmental effects. Each park management plan establishes the context and vision for the park, guided by the *Canada National Parks Act*. Each management plan identifies major stressors affecting both natural and cultural resources from both inside and outside the park boundaries. Some of the main stressors include mining and oil and gas activities, agriculture, and road developments. Strategic goals, objectives and actions are methodically developed to address the negative effects of identified stressors along with the identification of indicators of change. Each park management plan specifically addresses effective human use management and prescribes strategic goals, objectives and key actions to be implemented including actions to manage or restrict commercial recreation use where necessary. All park management plans are subject to strategic environmental assessment in accordance with the *1999 Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals* before the plan is signed off by the Minister. Strategic environmental assessments also focus on the cumulative effects of the key actions outlined in management plans to determine if the plan moves the state of the park towards, or away from, a state of ecological and cultural integrity.

Cumulative effects assessment (CEA) includes past, present and future projects that may impact the same VECs as identified in this MCSR. The VECs selected for environmental assessment as part of the MCSR were selected from the indicators outlined in the park management plans and as a result already reflect the stressors which may have the potential to cause cumulative environmental effects (see Section 3.1). With the CEA incorporating and focusing on the indicators and stressors identified in the Park Management Plans, further identification or analysis of potential cumulative effects stressors either inside or outside the park is not re-considered within the MCSR.

A two-tiered assessment process has been developed within the CSPR forms for evaluating the cumulative effects of aquatic-based commercial guiding activities focusing on the same VECs as identified from the stressors and indicators identified in the park management plans. The first level of assessment integrates cumulative effects assessment with the annual business licencing process and facilitates Parks Canada’s ability to make

a determination of the significance of cumulative effects on a project specific basis as required by the *Canadian Environmental Assessment Act*. Project specific cumulative effects assessment is facilitated through the class screening project report process.

The second level of assessment integrates cumulative effects assessment with the park management five-year review process and facilitates Parks Canada's ability to ensure that decisions on commercial guiding use are consistent with management plan direction. The integration of CEA with the park management plan review processes provides the focus for follow-up and reporting activities related to commercial guiding operations.

3.5.1. Integration of CEA, Class Screening and Business Licencing Review Process

Figure 4 outlines the annual business licencing and class screening process for proposed new or modified business licence applications. A Parks Canada pre-screening process ensures the activity is considered appropriate for a national park before the application is further evaluated. In the spring of every year applicants fill out the business licence application forms at which time a Parks Canada review team evaluates the applications and completes the CSPR evaluations for potential environmental effects, including cumulative effects. The results of the class screening process conducted by the review team are documented in the CSPR forms.

3.5.1.1. Areas Vulnerable to Cumulative Effects

Vulnerability to cumulative effects varies across the mountain parks depending on ecological and wildlife habitat characteristics, levels and type of independent and commercial visitor use, incidental park use e.g., use of transportation and utility corridors, and the presence of built infrastructure.

Not all sensitive sites identified are considered to be equally vulnerable to cumulative effects for a variety of reasons including management plan direction, restrictive zoning designations and ease of access. In order to assist with the identification of the most relevant areas and issues, a vulnerability analysis was conducted (Appendix 3). The vulnerability analysis was used to confirm existing knowledge and expert opinion of Parks Canada staff and to identify potential areas of concern not previously identified. The CEA focuses on areas considered to be vulnerable to cumulative effects based on all three information sources. These areas are summarized in Table 5.

The CSPR and business licence review process serve as the tools for Parks Canada to identify and evaluate impacts to VECs in each sensitive area. It should be noted that while the CSPR is focused on the areas of special concern listed in Table 5, it is not necessarily restricted to the evaluation of these areas. The CSPR also provides an opportunity for the identification of other cumulative effects issues and areas of concern related to a particular licence application.

3.5.1.2. Cumulative Impacts to Wildlife

Cumulative impacts to wildlife are assessed by focusing on species of concern in both summer and winter seasons. Potential impacts to Grizzly bears serve as the indicator of cumulative effects to wildlife for the summer season. Potential impacts to Wolverine,

Lynx and Caribou serve as the indicator of cumulative effects to wildlife for the winter season. Potential impacts to other sensitive wildlife species serve as the indicator of cumulative effects to wildlife on a site-specific basis. Specific cumulative effects indicators related to the selected components of the wildlife VEC to be assessed through the CSPR and Business Licence Review Process include:

- ⊘ Increase in Human-bear interactions that may lead to habituation or human injury
- ⊘ Increase in Human caused displacement of grizzly bears from prime food sources
- ⊘ Decrease in grizzly bear habitat effectiveness
- ⊘ Decrease in effectiveness of winter Caribou habitat including increased predator access or disruption of calving or rutting seasons
- ⊘ Decrease in effectiveness of winter Wolverine habitat including increased predator access
- ⊘ Decrease in effectiveness of winter Lynx habitat including increased predator access
- ⊘ Disruption of other wildlife during sensitive seasons including nesting, denning, rearing or breeding seasons

Figure 4: Annual Business Licence and Class Screening Review Process

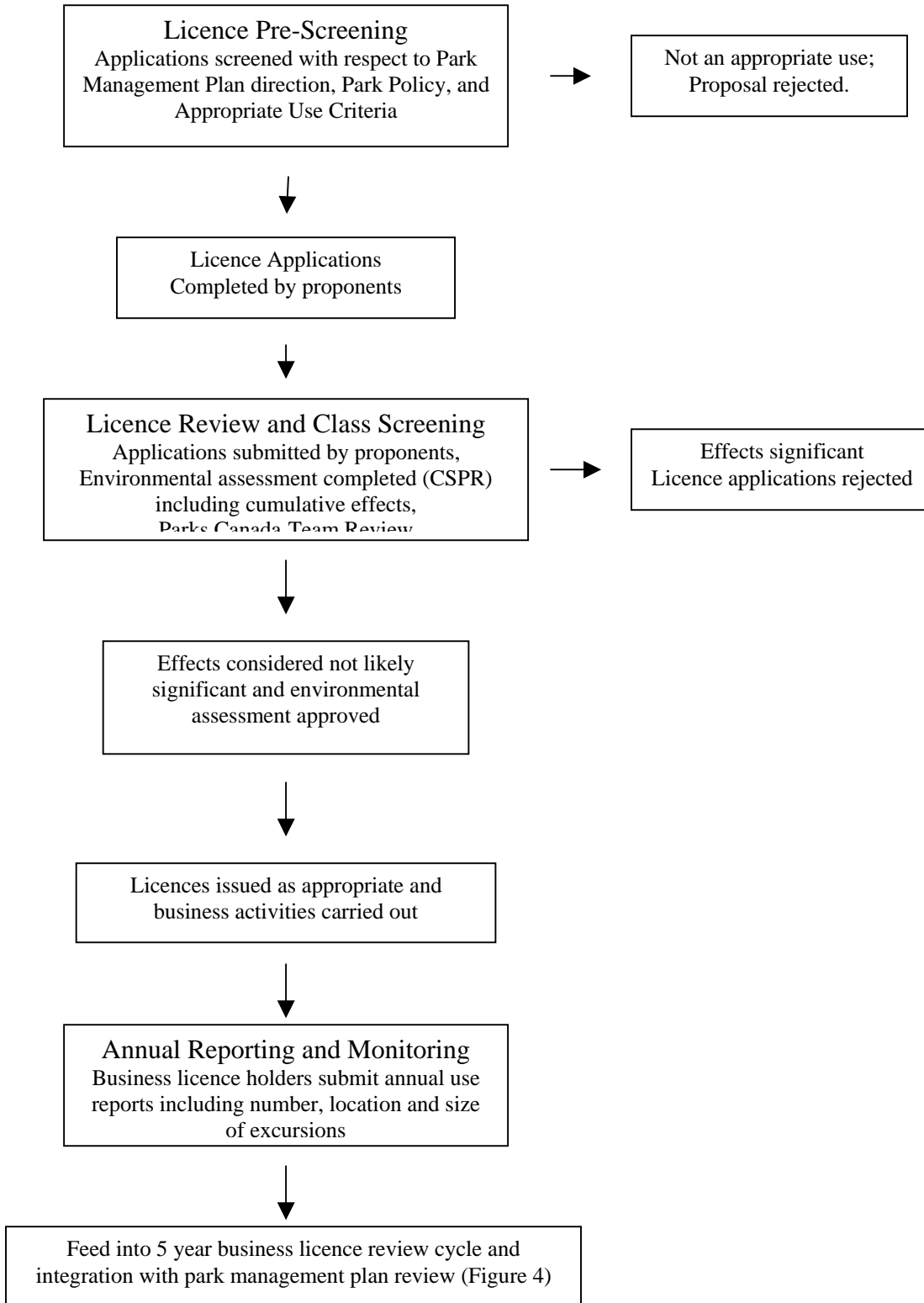


Table 5. Areas of sensitivity for cumulative effects analysis in the CSPR form.

Park	Sensitive Areas
Jasper	Cavell Meadows Wilcox Pass Opal Hills Tonquin Valley Maligne Outlet and Valley Skyline area
Banff	Johnson Lake Skoki/Baker creek LMUs Paradise/Moraine Lake valleys Helen Lake/Dolomite Pass/North Molar Pass
Kootenay	Wolverine Pass/Tumbling Creek Area Kindersley Summit
Yoho	Ice River Valley Otterhead River Valley Sherbrooke Lake Hamilton Lake Emerald Lake Vegetation ESS
Waterton Lakes	Lineham Lake Lower Blakiston Creek wetlands

3.5.1.3. Cumulative Impacts to Vegetation and Soils

Repeated use of a given site will likely result in an increase in the magnitude of environmental effect. Loss of vegetation cover and soil erosion may occur at heavily used sites. However the geographic extent of such impacts is still unlikely to result in significant environmental effects that threaten the existence of species or biological communities at an ecosystem scale.

The extent of non-native vegetation is one of the indicators of ecological integrity identified in park management plans. Despite implementation of the mitigation, non-native species may be introduced into the park or spread further through the park. Non-native species can compete with native species and change natural ecosystems. These impacts would affect the ecological integrity of the parks.

In order to focus the CEA on the issues and areas of greatest concern, cumulative impacts to vegetation and soils are assessed by focusing on sensitive species and seasonal timing, and on the potential for the introduction and spread of non-native vegetation. Specific cumulative effects indicators related to the selected components of the vegetation and soils VEC to be assessed through the CSPR and Business Licence Review Process include:

- ⊘ Introduction or spread of invasive non-native plant species into new areas of the parks
- ⊘ Introduction or spread of new non-native species that are a particular threat

- ⌘ Impacts to known locations of rare or endangered plant species
- ⌘ Impacts to areas of native vegetation at sensitive times.

3.5.1.4. Cumulative Impacts to Water Quality

There are no expected residual environmental effects to water quality as a result of the activities of land-based commercial guiding activities after implementation of standard and site-specific mitigation as outlined in the CSPR. As a result cumulative effects to water quality are not specifically considered in the CSPR or the Business Licence Review Process.

3.5.1.5. Cumulative Impacts to Cultural Resources

Repeated use of a given site will likely result in an increase in the magnitude of environmental effects to cultural resources. Loss of vegetation cover and soil erosion may occur at heavily used sites and in turn result in exposure or inadvertent impacts to buried resources. In order to focus the CEA on the issues and areas of greatest concern, cumulative impacts to cultural resources are assessed by focusing on impacts in areas of repeated use. Specific cumulative effects indicators related to the cultural resources VEC to be assessed through the CSPR and Business Licence Review Process include:

- ⌘ Regular or repetitive use of cultural resource sites
- ⌘ Impacts to the integrity or context of cultural resources.

3.5.1.6. Cumulative Impacts to Visitor Experience

The management plans and human use strategies for the parks identify management approaches for addressing cumulative effects to visitor experience. The dynamic nature of the relationship between independent use, commercial use, and overall human use management objectives and actions means that the potential for cumulative effects will change over time. The cumulative impacts of commercial guiding on the quality of visitor experience should be evaluated based on current surveys and visitor use information.

Cumulative effects indicators related to the Visitor Experience VEC to be assessed through the CSPR and Business Licence Review Process include:

- ⌘ Conflicts between user groups
- ⌘ Decrease in visitor satisfaction.

3.5.2. Integration of CEA, Class Screening and Park Management Plan Review Process

Commercially guided activities make up a low proportion of visitor use and are anticipated to have relatively minor impacts on the selected VECs compared to the influence of other projects and activities including park management activities, transportation and utility corridors, park communities, independent visitor use and activities outside the park boundaries. As a result, the contribution of commercial guiding activities to cumulative effects are most effectively identified and managed at a landscape scale in concert with other projects and activities. The park management planning process is the appropriate tool to facilitate cumulative effects assessment across

the mountain parks. The MCSR for commercial guiding activities establishes the process for integrating consideration of the impacts of commercial guiding activities into the five-year park management planning process.

There are four main steps to the integration of cumulative effects assessment and the Class Screening process with the park management planning process as illustrated in Figure 5:

- Ø Summary reporting on commercial guiding activity
- Ø State of the Parks Report
- Ø Five Year parks management plan review
- Ø Amendments to the Class Screening process.

Summary Reporting on Commercial Guiding Activity

The submission of annual activity reports is a standard stipulation of a business licence for commercial guiding operations. Reports include information on the number, timing and location of trips and the number of participants. Annual report information is stored in an electronic database and can be queried by trail or land management unit. In preparation for the five-year management plan review, report information will be summarized to establish the locations and trends in commercial use. The same Parks Canada review team that reviews the annual business licence applications will be responsible for reviewing this information and identifying trends and issues of relevance to the management planning process.

State of the Parks Report

The summary and evaluation of commercial guiding activity is one piece of information that will be used by Parks Canada to write the State of the Parks Report every five years. Other information contributing to the State of the Parks Report includes ecological integrity indicator monitoring, implementation of park management activities and other ecological or social research. The State of the Parks report will provide an evaluation of ecological integrity and cumulative effects at the park scale. This information is then used to guide changes in the five year park management plan review.

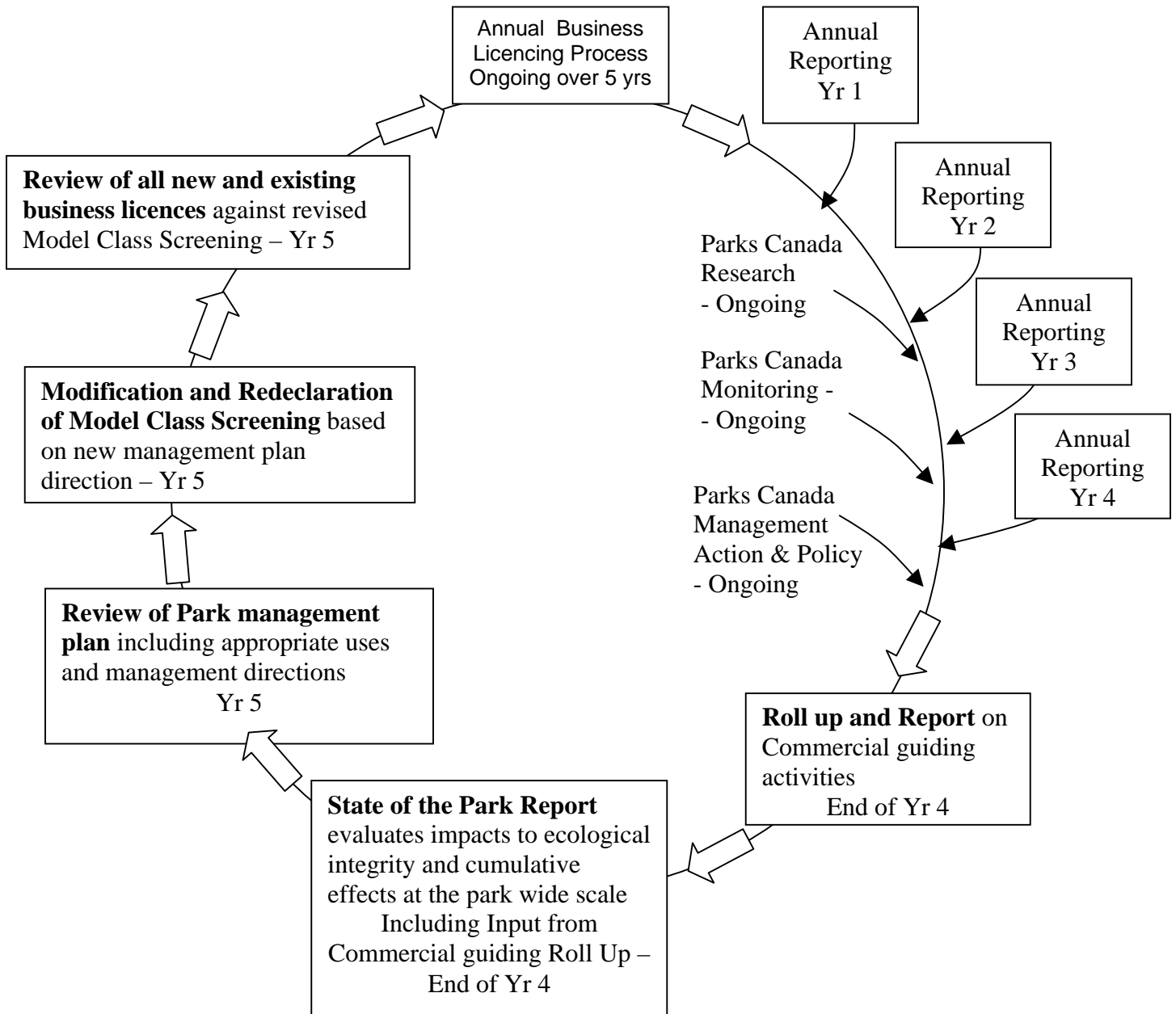
Five Year Park Management Plan Review

In order to address cumulative impacts, management plans for the parks identify indicators of ecological integrity that are responsive to change and reflect overall ecosystem health. The cumulative effect of all activities on indicators is monitored over the 5-year term of the management plan and the results of monitoring and information gained through the model class screening process are used as input into the state of the parks report. The five year management plan review re-evaluates the state of ecological integrity indicators and updates management actions in response to the state of the parks report (Parks Canada 2000a; Parks Canada 2000b; Parks Canada 2000c; Parks Canada 2000d). Management plan actions related to commercial guided activities would be prescribed for areas where the level of overall human use impacts are considered unacceptable and where limitations to commercial use would have a discernable benefit. Potential actions could include a wide range of measures including: trail closures, timing restrictions, allocation limits or restrictions on new licences.

Amendments to the Class Screening Process

The updated park management plans are expected to provide direction as necessary related to the management of cumulative effects with respect to commercial guiding activities. Direction provided in the management plan will be used to update and modify the Class Screening and business licence processes. All business licences will then be reviewed using the new model class screening to ensure that mitigation and licence stipulations are appropriate and up-to-date.

Figure 5: Five-Year Business Licence Review Process



3.6. Surveillance

Surveillance of commercial guiding activities is on going and ensures that required mitigation is implemented and restrictions or stipulations are complied with. Surveillance also provides the opportunity to react to unpredicted environmental effects in a timely manner. Park wardens routinely monitor conditions in the backcountry and will be able to evaluate whether commercial operators are implementing required mitigation. Park Wardens, in cooperation with Park managers, are also able to identify and enforce any site-specific or short-term mitigation to respond to unpredicted environmental effects. Commercial guides need to stay informed about park policies and management directions to ensure they are in compliance.

3.7. Follow-Up

According to the *Act*, follow-up is “a program to confirm the accuracy of the environmental assessment of the project and to determine the effectiveness of mitigation measures”. Follow-up monitoring is designed to verify the accuracy of the environmental assessment and the proposed mitigation. Follow-up monitoring is also used to identify and record potential cumulative impacts.

The end-of-season reports and monitoring by Parks Canada are part of an adaptive management and cumulative effects assessment process. Reporting requirements are part of the business licensing and review process and are adapted into the park management planning process as outlined in Section 3.5. Parks Canada is responsible for on going monitoring of ecological integrity indicators, trail conditions, visitor experience and trailhead facility conditions. Therefore, the appropriate follow-up monitoring programs are identified through the management planning and business planning processes. Examples of ongoing monitoring programs include: numbers and distribution of wildlife populations, number of interactions between wildlife and people, area and distribution of vegetation burned, water quality and the indicators chosen for the cumulative effects analysis in the CSPR (Sections 3.5.1.2, 3.5.1.3, 3.5.1.4, 3.5.1.5, and 3.5.2.6). No specific monitoring of commercial guiding activities is required as a result of this assessment.

4. Consultation

4.1. Public Consultation Process

Public consultation took place at two stages during the development of the Class Screening process; consultation conducted by Parks Canada as part of the development of the MCSR, and consultation at the declaration stage conducted by the CEAA. The intent of consultation during the development of the MCSR was to create awareness of the proposed Model Class Screening process, to offer the opportunity to review both the draft MCSR and draft CSPR forms, and to provide comments and suggestions to Parks Canada prior to their submission to the CEAA for declaration. Subsequently, the Canadian Environmental Assessment Agency offered the public the opportunity to review the proposed Model Class Screening as part of the declaration process.

Three stakeholder groups were considered most likely to have an interest in the class screening process: guiding business operators, guiding and tourism organizations and environmental groups. Commercial operators and tourism organizations could be concerned with the potential for additional restrictions and operational requirements that may be applied as mitigation. In the past some environmental groups have expressed concern over the approach used for assessing guided hiking. As a result of these concerns, additional opportunities for consultation were offered through the MCSR development process to allow for early identification of issues.

The initial stage of the consultation process identified potential stakeholder concerns and issues with the environmental assessment process and determined the level of interest among stakeholder groups as well as the need for, and requirements of, any further consultation.

4.1.1. Objectives of Consultations During MCSR Development

The proposed objectives for consultations with identified stakeholders were to:

- ☞ Inform stakeholders of Parks Canada's intention to create a Model Class Screening, including the intended outcome, the benefits and how it will affect business licence proponents
- ☞ Identify the opportunities to be involved in the process of developing the Model Class Screening
- ☞ Explain how to obtain additional information and who to contact
- ☞ Offer interested individuals and organizations the chance to review and comment on the draft Model Class Screening Report and the Class Screening Project Report Form prior to submission of the documents to the CEAA for declaration.

4.1.2. MCSR Development Consultation Approach

A cover letter and information backgrounder was developed and mailed out to all identified stakeholders through the respective Superintendents offices. The information provided the background and objectives of the proposed Model Class Screening for Guided Activities in the Mountain Parks. This package outlined the key elements of the

Model Class Screening; the process leading to the formal declaration of a Model Class Screening; how additional information could be obtained; opportunities to review the proposed Model Class Screening documents; and all relevant Parks Canada contacts.

Parks Canada staff followed up directly with a representative group of key stakeholders to assess the preliminary reaction to the Class Screening proposal and determine if there was interest in reviewing the draft proposal and providing feedback. Follow-up was carried out over the phone or through one-on-one meetings. Written feedback from business groups and environmental groups was coordinated through the Parks Canada Western Canada Service Centre office. Parks staff coordinated one-on-one feedback from individual operators. Comments and suggestions were considered or incorporated into the environmental assessment process where appropriate. Responses to comments or suggestions not incorporated were recorded. The need for further consultation or stakeholder review and the process for further review were determined. Opportunity to review the draft Screening documents was offered to interested stakeholders.

The draft Class Screening was distributed for review and comment to interested stakeholders. Comments received were recorded, considered and incorporated into the Model Class Screening as appropriate. Public comments received on the Draft Model Class Screening Report for Land-based Commercial Guiding Activities were summarized focusing on the identification and discussion of main themes and issues. The majority of comments have resulted in changes to the format and content of the Model Class Screening Report, or in changes to the Class Screening process itself. The summary of public comments is found in Appendix 4.

4.2. CEEA Consultation

Following the submission of the MCSR to the Canadian Environmental Assessment Agency, it underwent a formal 30-day public review prior to declaration. As with the consultation on the development of the MCSR, comments received were recorded, considered and incorporated into the Model Class Screening Report as appropriate.

4.3. Federal Coordination Regulations

Class screenings are not subject to the Federal Coordination Regulations. However, as part of due diligence, Parks Canada has reviewed whether there are other federal authorities that may (a) exercise a power in respect of the project; or (b) be in possession of specialist or expert information necessary to conduct the environmental assessment of the project.

No Federal Authorities were identified that would exercise a power in respect of the project or act as a Responsible Authority under the *Act*. Federal Authorities with specialist or expert information that may contribute to the environmental assessment were identified through consultation with regional CEEA representatives in Alberta and British Columbia.

4.3.1. Federal Departments

Parks Canada has sole authority over all lands affected by land-based commercial guiding in the National Parks of Canada and is the sole authority for enforcement of the *Canada National Parks Act*. Under the *Species at Risk Act* (SARA) the Minister of Canadian Heritage is responsible for all species at risk in national protected heritage areas administered by Parks Canada including national parks and national historic sites. Issues related to land-based commercial guiding activities are not expected to affect other environmental issues such as water quality or fish habitat that may involve the jurisdiction or interest of other Federal departments.

4.3.2. Provincial Departments

No provincial departments were identified that would have an interest in the Model Class Screening. Commercial guiding business licences issues by Parks Canada are expected to have negligible impacts on lands or resources within provincial jurisdiction.

4.3.3. Other Expert Consultations

Appropriate experts within Parks Canada including environmental assessment specialists, wildlife and conservation biology specialists, cultural resource specialists, planners and the warden service reviewed the Model Class Screening Report.

The inclusion of guiding and tourism associations and environmental groups in the consultation process was felt to have addressed the need for additional expert consultation related to business and environmental issues. No other experts with an interest or expertise related to the Class Screening process were identified.

4.4. Canadian Environmental Assessment Registry

The purpose of the Canadian Environmental Assessment Registry (the Registry) is to facilitate public access to records relating to environmental assessments and to provide notice in a timely manner of assessments. The Registry consists of two components – an Internet site and a project file.

The Internet site is administered by the Agency. The responsible authority and the Agency are required to post specific records to the Internet site in relation to a class screening report and any related class screening project reports.

Upon declaration of the class screening report, the Act requires responsible authorities to post on the Internet site of the Registry, at least every three months, a statement of projects for which a model class screening report was used. The statement should be in the form of a list of projects, and will include:

- the title of each project for which the model class screening report was used;
- the location of each project; and

- the date of the environmental assessment decision for each project and;
- a contact name.

The project file component is a file maintained by the responsible authority during an environmental assessment. The project file must include all records produced, collected or submitted with respect to the environmental assessment of projects, including class screening project reports and all records included on the Internet site. The responsible authority must maintain the file, ensure convenient public access, and respond to information requests in a timely manner.

Further information regarding the Registry can be found in “The Canadian Environmental Assessment Registry”, prepared by the Agency.

4.5. Amending the Model Class Screening Report

4.5.1. Amendment Procedures

The purpose of an amending procedure is to allow the modification of the MCSR after experience has been gained with its operation and effectiveness. The reasons for such modification may include:

- clarification of ambiguous areas of document and procedures;
- streamlining or modifying the planning process in areas where problems may have arisen;
- minor modifications and revisions to the scope of assessment to reflect new or changed regulatory requirements, policies or standards; and
- new procedures and environmental mitigation practices that have been developed over time.

The responsible authority will notify the Agency in writing of its interest to amend the MCSR. It will discuss the proposed amendments with the Agency and affected federal government departments and may invite comment from stakeholders and the public on the proposed changes. The responsible authority will then submit the amended MCSR to the Agency, along with a request that the Agency amend the MCSR and a statement providing a rationale for the amendment.

The Agency may amend the MCSR without changing the declaration period if the changes:

- are minor;
- represent editorial changes intended to clarify or improve the screening process;
- do not materially alter either the scope of the projects subject to the MCSR or the scope of the assessment required for these projects; and
- do not reflect new or changed regulatory requirements, policies or standards.

The Agency may initiate a new declaration for the MCSR for the remaining balance of the original declaration period or for a new declaration period if the changes:

- ∄# are considered to be substantial; or
- ∄# represent modifications to the scope of the projects subject to the class or the scope of the assessment required for these projects.

4.5.2. Term of Application

The term of the Class Screening will be coordinated with the five year Mountain Park Management Plan review, scheduled currently for 2008. As part of the management plan review the Class Screening process will be reviewed and amended as required. The coordination of the park management plan review and the review of the Class Screening process will provide the policy and human use strategy context for managing commercial guiding activities over the subsequent five-year period.

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Appendices

Appendix 1 - Class Screening Project Report

Appendix 2 - Best Management Practices

Appendix 3 – Vulnerability Analysis

Appendix 4 - Summary of Public Comments

Appendix 1

Class Screening Project Report for Land-based Commercial Guiding Activities in the Mountain National Parks of Canada

Class Screening Project Report for Land-based Commercial Guiding Activities in the Mountain National Parks of Canada

Introduction

This Class Screening Project Report is based on information provided in the *Model Class Screening Report for Land-based Commercial Guiding Activities in the Mountain National Parks of Canada*.

The Class Screening Project Report is to be completed in its entirety by Parks Canada staff and is to be based on information provided by the applicant through the approved Business Licence Application Process.

Section 1 – Applicant Information

Company Name		
Business License Application Reference #		
Purpose of Application Check One	<input type="checkbox"/>	New Business licence – environmental assessment required
	<input type="checkbox"/>	Change or Expansion of Existing Business License – environmental assessment required
	<input type="checkbox"/>	Renewal of Existing Business License – no environmental assessment required – Do Not Continue with the CSPR

Section 2 – Application of the Class Screening

This section determines whether the Model Class Screening process applies to the proposed project.

Part A	Yes	No
Does the proposed activity require a business licence from Parks Canada under Section 3 of the <i>National Parks Businesses Regulations 1998</i> ?		
Is the business licence for operation in Banff, Kootenay, Yoho, Jasper, Glacier, Mount Revelstoke or Waterton Lakes National Parks of Canada?		
Is the business licence for guided hiking, guided mountaineering, guided horse outfitting, guided winter trips, or guided overnight trips activities as described in the subclasses of the MCSR?		

If “yes” to all of the above continue on.

If “no” to any of the above

Do Not Continue with the CSPR

Contact Parks Canada Environmental Assessment Specialist
for information about environmental assessment requirements.

Part B	Yes	No
Is the business licence for operating a one-time, occasional or annual special event such as military exercise, sporting event, or festival?		
Is the business licence associated with the physical operation of ski hill or golf course?		
Does the business require or currently hold a lease and licence of occupation?		
Does the business proposal involve the establishment of a permanent or semi-permanent backcountry camp for the season?		

If “no” to all continue on.

If “yes” to any of the above.

Do Not Continue with the CSPR

Contact Parks Canada Environmental Assessment Specialist
for information about environmental assessment requirements.

Section 3 – Standard Environmental Effects and Mitigation

This section identifies three levels of standard mitigation measures to be applied to the proposed commercial guiding operation as a condition of the business licence.

Generic Commercial Guiding Mitigation

The generic commercial guiding mitigations apply to all commercial guiding operations and must be attached as a condition of all business licences.

Activity Specific Mitigation

Activity specific mitigation applies for all parks included as part of the proposed business operation. Please check all activity specific mitigation categories that apply.

Activity Specific Mitigation	Hiking Includes interpretive hiking and day hiking on established trails and other approved non-technical terrain	<input type="checkbox"/>
	Mountaineering Includes general mountaineering, rock climbing, and alpine climbing	<input type="checkbox"/>
	Winter Sports Includes ice climbing, snowshoeing, cross country skiing, backcountry skiing	<input type="checkbox"/>
	Horse packing Includes day trips, and multi-day horse packing trips	<input type="checkbox"/>
	Overnight Includes camping at established sites or non-established sites	<input type="checkbox"/>

Sensitive Sites Mitigation

Sensitive Sites mitigation applies for all parks included as part of the proposed business operation. Please check all sensitive sites mitigation categories that apply.

Sensitive Sites Mitigation	Jasper	<input type="checkbox"/>
	Banff, Yoho, Kootenay	<input type="checkbox"/>
	Waterton	<input type="checkbox"/>
	Mount Revelstoke/Glacier	<input type="checkbox"/>

**The generic commercial guiding mitigations as well as the activity specific and site specific mitigation measures that have been checked off above are to be attached as conditions of the business licence under;
Business Licence Schedule A) Section 3) “Environmental Stewardship”.**

Section 4 – Additional Environmental Effects

This section evaluates additional project activities and site-specific environmental effects that may not be addressed through the application of standard mitigation measures identified in Section 3.

Part A: Check all areas of concern proposed for use as part of the business licence application. For each area checked off, also indicate if there are potential environmental effects that are not adequately addressed through the application of the three levels of standard mitigation as identified in Section 3. For assistance please refer to section 3 in the MCSR for site sensitivities and predicted environmental effects related to the following areas of concern.

Table 4A

Additional Potential Environmental Effects Areas Affected by proposed operations			Additional Potential Environmental Effects Areas Affected by proposed operations		
	↓	↓		↓	↓
Banff			Yoho		
Johnson Lake			Ice River Valley		
Skoki Valley			Otterhead River Valley		
Flints Park			Ottertail River Flats ESS		
Middle Spray			Kicking Horse Pass		
Bryant Creek			Sherbrooke Lake		
Paradise Valley			Paget Lookout		
Moraine Valley			Emerald Lake Vegetation ESS		
Cave & Basin Marsh			Porcupine Creek Valley		
Vermillion Lake Wetlands			Amiskwi River Valley		
Middle Springs			Hamilton Lake		
Fairholme/Carrot Creek ESS			Emerald Basin		
Tunnel Mountain			Lenchoil Marsh ESS		
Castleguard Cave & Meadows			Wapta Marsh ESS		
Pipestone/Upper Bow LMUs					
Vermillion Pass			Kootenay		
Kicking Horse Pass			Burgess Shales Outcrops		
Howse Pass			Ice River Complex		
Sunset Pass			Kaufmann Lake Archaeological		
Thompson Pass			Mt Wardle Zone 1		
Nigel Pass			Mt Verendrye Zone 1		
			Wardle Flats ESS		
Jasper			Dry Gulch ESS		
Cavell Meadows			Sora and Sundew Ponds ESS		
Wilcox Pass			Moonwart ESS		
Opal Hills					
Tonquin Valley			Mt Revelstoke/Glacier		
Maligne Outlet Area and Valley			Cougar Valley		
Skyline Area			Nakimu Caves		
Surprise Valley			Glacier House		

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Additional Potential Environmental Effects			Additional Potential Environmental Effects		
Areas Affected by proposed operations		↓	Areas Affected by proposed operations		↓
Waterton Lakes			Other:		
Crandell Lake and trail					
Alderson Carthew					
Crypt Lake					
Bertha Lake and trail					
Lower Blakiston trail					

Part B: With respect to additional potential environmental effects as described above, is additional information required in order to assess these effects or to make an environmental assessment determination? If yes, specify and attach required information.

Table 4B

Describe information requirements and list attachments: Enter NA if not applicable
1.
2.
3.

Part C: Using Table 4C:

- Ø only enter the areas of concern identified in Part A that are indicated to have additional potential environmental effects
- Ø describe any additional environmental effects related to the proposed project, that may not be addressed through the application of the three levels of standard mitigation.
- Ø identify any additional mitigation measures required to address additional environmental effects.

**Additional mitigation measures as described in Part C are to be attached as conditions of the business licence under;
Business Licence Schedule A) Section 3) “Environmental Stewardship”.**

Table 4C

Area of Concern:	
Environmental Effects	Mitigation
Area of Concern:	
Environmental Effects	Mitigation
Area of Concern:	
Environmental Effects	Mitigation
Area of Concern:	
Environmental Effects	Mitigation

Part D: For each area of concern identified in Table 4C, indicate the level of residual adverse environmental effects following mitigation using Table 4D. Choose one of the following levels of effects based on Table 1 of the MCSR:

- Ø Negligible Effects – not likely to affect ecological or cultural integrity
- Ø Minor Adverse Effects – insignificant impacts to ecological or cultural integrity
- Ø Considerable Adverse Effects – there is potential for significant impacts to ecological or cultural integrity
- Ø The effects of the proposed licenced activities are not adequately assessed through the CSPR process

Table 4D

Area of Concern	Level of Effects

If the level of effect is rated as considerable, or if the environmental effects of the proposed activities are not adequately addressed through the CSPR process;

DO NOT proceed with the Class Screening.

Contact Parks Canada Environmental Assessment Specialist
for advice on environmental assessment requirements.

Section 5 – Cumulative Effects Assessment

This section is used to evaluate the cumulative impacts of the proposed commercial operation.

Factors to be considered in the cumulative effects assessment should include:

- Ø The nature of the proposed operation including the type of activity and the intensity and timing of use;
- Ø The sensitivity of the areas of concern affected by the proposed operation;
- Ø Direction provided in park management plans, state of the parks reports and other monitoring information;
- Ø Spatial and temporal overlap of activities, additive or repetitive impacts, and synergistic effects
- Ø The relative contribution of the proposed operation to cumulative visitor use impacts

In addition to the factors above, cumulative environmental effects on areas of concern affected by the proposed operation are assessed against established indicators of ecological integrity for each area of concern (Table 5A), as identified in the Model Class Screening Report. Note: if any species at risk are affected, the MCSR is not applicable (see Section 6 below).

Table 5A

VEC	Cumulative Effects Indicators
Wildlife	Increase in human-bear interactions that may lead to habituation or human injury
Wildlife	Increase in human caused displacement of grizzly bears from prime food sources
Wildlife	Decrease in grizzly bear habitat effectiveness
Wildlife	Decrease in effectiveness of winter caribou habitat including increased predator access or disruption of calving or rutting seasons
Wildlife	Decrease in effectiveness of winter wolverine habitat including increased predator access
Wildlife	Decrease in effectiveness of winter lynx habitat including increased predator access
Wildlife	Disruption of other wildlife during sensitive seasons including nesting, denning, rearing or breeding seasons
Vegetation	Introduction or spread of invasive non-native plant species into new areas of the parks
Vegetation	Introduction or spread of new non-native species that are a particular threat
Vegetation	Impacts to known locations of rare or endangered plant species
Vegetation	Impacts to areas of native vegetation at sensitive times.
Cultural R	Regular or repetitive use of cultural resource sites
Cultural R	Impacts to the integrity or context of cultural resources
Visitor exp	Increased conflicts between user groups
Visitor exp	Decrease in visitor satisfaction

Part A: Consistent with Section 4, Part A, check all areas of concern proposed for use as part of the business licence application. For each area checked off, also indicate if the proposed project has the potential to contribute to adverse effects on any of the cumulative effects indicators identified in Table 5A (after taking into account the implementation of standard and additional mitigation measures outlined in Sections 3 and 4 of the CSPR).

Table 5B

Potential Adverse Effects on CE Indicators		Potential Adverse Effects on CE Indicators	
Areas Affected by proposed operations		Areas Affected by proposed operations	
	▼		▼
Banff		Yoho	
Johnson Lake		Ice River Valley	
Skoki Valley		Otterhead River Valley	
Flints Park		Ottertail River Flats ESS	
Middle Spray		Kicking Horse Pass	
Bryant Creek		Sherbrooke Lake	
Paradise Valley		Paget Lookout	
Moraine Valley		Emerald Lake Vegetation ESS	
Cave & Basin Marsh		Porcupine Creek Valley	
Vermillion Lake Wetlands		Amiskwi River Valley	
Middle Springs		Hamilton Lake	
Fairholme/Carrot Creek ESS		Emerald Basin	
Tunnel Mountain		Lenchoil Marsh ESS	
Castleguard Cave & Meadows		Wapta Marsh ESS	
Pipestone/Upper Bow LMUs			
Vermillion Pass		Kootenay	
Kicking Horse Pass		Burgess Shales Outcrops	
Howse Pass		Ice River Complex	
Sunset Pass		Kaufmann Lake Archaeological	
Thompson Pass		Mt Wardle Zone 1	
Nigel Pass		Mt Verendrye Zone 1	
		Wardle Flats ESS	
Jasper		Dry Gulch ESS	
Cavell Meadows		Sora and Sundew Ponds ESS	
Wilcox Pass		Moonwart ESS	
Opal Hills			
Tonquin Valley		Mt Revelstoke/Glacier	
Maligne Outlet Area and Valley		Cougar Valley	
Skyline Area		Nakimu Caves	
Surprise Valley		Glacier House	
Waterton Lakes		Other:	
Crandell Lake and trail			
Alderson Carthew			

Potential Adverse Effects on CE Indicators		Potential Adverse Effects on CE Indicators	
Areas Affected by proposed operations		Areas Affected by proposed operations	
	▼		▼
Crypt Lake			
Bertha Lake and trail			
Lower Blakiston trail			

Part B: Using Table 5C

- Ø only enter the areas of concern identified in Table 5B that are indicated to have the potential to contribute to adverse effects on the cumulative effects indicators
- Ø identify the cumulative effects indicators that may be affected by the proposed project
- Ø identify any additional operator-specific cumulative effects mitigation measures required to address cumulative environmental effects.

Additional operator-specific cumulative effects mitigation measures, restrictions or conditions as described above are to be attached as conditions of the business licence under;

Business Licence Schedule A) Section 3) “Environmental Stewardship”.

Table 5C

Area of Concern:	
Cumulative Effects Indicators	Mitigation
Area of Concern:	
Cumulative Effects Indicators	Mitigation
Area of Concern:	
Cumulative Effects Indicators	Mitigation
Area of Concern:	
Cumulative Effects Indicators	Mitigation

Part C: For each area of concern identified in Table 5C, indicate the level of residual cumulative adverse environmental effects following mitigation using Table 5D. Choose one of the following levels of effects based on Table 1 of the MCSR:

- Negligible Effects – not likely to affect ecological or cultural integrity
- Ø Minor Adverse Effects – insignificant impacts to ecological or cultural integrity
- Ø Considerable Adverse Effects – there is potential for significant impacts to ecological or cultural integrity
- Ø The effects of the proposed licenced activities are not adequately assessed through the CSPR process.

Table 5D

Area of Concern for Cumulative Effects	Level of Effects

If the level of effect is rated as considerable, or if the environmental effects of the proposed activities are not adequately addressed through the CSPR process;

DO NOT proceed with the Class Screening.

Contact Parks Canada Environmental Assessment Specialist
for advice on environmental assessment requirements.

Section 6 – Species at Risk Act

Is the proposed project likely to adversely affect a species at risk which includes:

- ≠ species identified on the List of Wildlife Species at Risk set out in Schedule 1 of the *Species at Risk Act (SARA)*, and including the critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*.
- ≠ species that have been recognized as "at risk" by COSEWIC or by provincial or territorial authorities.

Yes ___

No ___

If Yes, Do Not Continue with the CSPR

Contact Parks Canada Environmental Assessment Specialist
for information about environmental assessment requirements.

Section 7 – Monitoring and Follow-up

Compliance monitoring, monitoring of impacts and follow-up activities related to most commercial guiding operations will be generally carried out as part of the regular duties of the warden service and as indicated in Sections 3.6 and 3.7 of the Model Class Screening Report.

If considered necessary, describe any special requirements for compliance or environmental impact monitoring in relation to the proposed commercial guiding operation. Attach additional information as required.

Section 8 – Decision Statement

- Business License may be issued as the proposed activities are not likely to cause significant adverse environmental effects.
- Business License should not be issued because the proposed activities are likely to cause significant adverse environmental effects.

Applicant

Date

Environmental Assessment Reviewer

Date

Field Unit Superintendent

Date

Appendix 2

Standard Activity-Specific and Site-Specific Best Management Practices

Generic Best Management Practices for All Guiding Activities

The following best management practices apply to all guiding operations included in the scope of the Model Class Screening. “Operator” refers to the company offering the service. “Guide” refers to the individuals actually in the park leading the visitors.

General

In addition to the measures outlined in the Model Class Screening, business operators and guides are expected to comply with any local park regulations, policies, guidelines, travel restrictions, area closures, established reservation systems or other directives issued by Parks Canada for the purpose of mitigating environmental effects or ensuring public safety. Posted voluntary restrictions on trails should be considered as mandatory restrictions by commercial operators and remain in effect until acceptable trail conditions exist and closures/restrictions are lifted unless, through consultation with Parks Canada, special permission is granted.

Guides are expected to act as stewards, set proper examples for trail etiquette, and educate guests on the importance of keeping areas pristine. Guides are expected to monitor client actions and ensure that minimal impact practices are implemented.

Wildlife

1. As part of a pretrip briefing, operators and guides shall ensure that all clients are aware of wildlife sensitivities and potential hazards, understand wildlife viewing and safety procedures and are aware of National Parks regulations on feeding, enticing or disturbing wildlife.
2. Wildlife viewing and safety procedures should be based upon the guidelines presented in Parks Canada brochure “Keep the Wild in Wildlife”. The brochure describes appropriate behaviour when encountering habituated wildlife, safe distances for viewing and photographing wildlife, avoiding encounters and limiting attractants while travelling in the backcountry, and specific precautions for bears, elk and cougars. This brochure can be found on the Banff National Park of Canada internet site (<http://www.worldweb.com/parkscanada-banff/visinfo.html>). Other safety information regarding wildlife in the mountain parks is available on the internet at <http://www.worldweb.com/parkscanada-banff/pubsafe.html>. Where practical, operators should recommend these websites to clients during the time of booking.
3. Guides shall manage groups during wildlife viewing opportunities such that the animal’s normal behaviour is not disturbed by not approaching wildlife, keeping lines of escape open for the animal and clients, and keeping groups close together. Use binoculars in situations where it is desirable to enhance viewing opportunities.
4. Guides shall maintain a distance of at least 100 metres from bears and a distance of at least 30 metres from elk and other large wildlife species.
5. Guides shall maintain a distance of at least 300 metres from known wildlife den sites and minimise close contact with nesting birds or young animals.

6. Guides shall leave the area immediately in the event that dens, nests or young animals are accidentally encountered.
7. Operators should discourage clients from bringing dogs on guided excursions. In the event that it is necessary to bring a dog, they are to be kept on leash at all times and must not be left unattended.
8. Guides and operators are asked to report wildlife sightings, unusual wildlife behaviour, encounters with wildlife, injured animals and carcasses to Parks Canada. Marked animals (radio collars, ear tags, leg bands on birds, neck bands on swans) and injured animals should also be reported.
9. Operators and guides and operators shall implement alternate trip or route plans as required in order to avoid close encounters with wildlife.

Operators and guides shall ensure that food and food smells are managed to avoid enticing wildlife:

10. All garbage and food waste must be packed out. Garbage or food waste shall not be burned, buried or otherwise disposed of in the backcountry.
11. All food, including pet food and livestock feed, should be stored in special caches provided, or hung between two trees at least 4 metres above the ground.
12. All dishes and food utensils shall be washed and stored immediately after use. Food particles shall be strained from dish-water and stored with garbage.
13. Guides shall ensure that groups keep trailhead areas and facilities clean to minimise the high percentage of animal mortality that occurs near human infrastructure (Parks Canada 2002a)

Soils and Vegetation

1. As part of a pretrip briefing, operators and guides shall ensure that all clients are aware of National Parks regulations on picking or removing vegetation. Clients should be briefed on travel procedures including potential impacts to vegetation and soils prior to departure from the trailhead.
2. Guides should request that clients check for and remove any bur-like seedpods or mud from boots, clothing and pets at trailheads and dispose in garbage containers to reduce risk of new weed infestations.
3. Operators and guides should make use of existing designated trails and established facilities including parking lots, trailheads, and picnic sites where possible, appropriate and available.
4. Ensure that clients have proper footwear for the trail and trail conditions including boots and gaitors if appropriate. Soft sole shoes should be preferentially selected when trail conditions warrant and for around camp.
5. Avoid using trails that have extensive wet areas or snow patches until later in the season when soils are dry and trails are clear of snow.
6. Groups should stay to the middle of the trail even when conditions are wet to avoid widening or braiding of trails.
7. Pass on wide parts of the trails to reduce trampling and trail widening.
8. Where a maze of multiple trails exist travel on those trails most heavily used, with the most durable surface and the least potential for erosion.

9. Do not use shortcuts or cut switchbacks and inform clients of the associated environmental impacts including vegetation damage, soil erosion, and damage to trail infrastructure.
10. Avoid the use of markers or cairns except where they would encourage proper use; never blaze trees or otherwise damage vegetation to mark a route.
11. Use hiking poles as pointers, binoculars or spotting scopes, or other aids to assist in heritage interpretation from the trail and avoid having to move off of hardened surfaces.
12. Concentrate traffic routes and rest stops in areas that are established for these purposes or that are already impacted.
13. Guides and operators are asked to report adverse trail and facility conditions, vandalism, and user group conflicts to Parks Canada.

Wherever feasible commercial guides and operators are expected to limit their activities to designated trails, rest stops and other established facilities. While off-trail travel by commercially guided groups is not encouraged, it is recognized that off-trail travel is permitted in the mountain parks and is integral to certain types of activities e.g., mountaineering. Off-trail travel allows other guided groups to access and explore remote areas, improve opportunities for wildlife and natural heritage presentation, and experience group solitude. Off-trail travel can be an appropriate means of reducing the intensity of environmental impacts in and around heavily used areas, and may be used to enhance visitor experience and reduce visitor conflicts for both commercial and private users. Where off-trail travel does occur, care and discretion is required in order to ensure that the benefits of off-trail travel are realized without causing additional environmental damage. The following mitigation must be followed:

1. Guides should choose routes or locations that follow or utilise the most durable surfaces whenever possible. Rock, talus, gravel and sand are considered to be the most durable surfaces. Snow is also a durable preferred travel surface provided that groups are equipped for comfort and safety.
2. Guides should choose routes or locations that minimise impacts to vegetation and soils. Areas of naturally sparse vegetation are preferred routes as trampling can be easily avoided. Dry vegetation and soils are more durable than wet vegetation or soils.
3. Guides should use discretion in the management of group travel and select the appropriate technique depending on the circumstances. When travelling through areas of undisturbed vegetation groups should spread out laterally to avoid repeated trampling and the creation of informal paths. In circumstances where travel is on durable surfaces it may be preferable to concentrate the group in one area or along one route.
4. In general guides should avoid concentrating use in sensitive areas such as wet alpine meadows, steep slopes and riparian areas or other areas close to water.
5. Select rest stops on durable surfaces.

Campfires are a traditional use that may enhance the visitor experience for many clients; however, unrestricted use of fires should be discouraged by operators and guides.

Operators should use gas stoves and lanterns as the primary sources of heat and light. Operators and guides shall ensure that they are aware of and comply with Park regulations, restrictions and bans pertaining to the use of campfires. Operators and guides should note that updates to restrictions and bans may occur frequently and with little notice. The National Park Fire Regulations limit campfires in the parks to certain types of facilities or equipment:

- 4(1) No person shall start or maintain any fire in a park except
 - a) in a fireplace on private property;
 - b) in a fireplace provided by the supt;
 - c) in a portable stove, hibachi or barbecue; or
 - d) when in possession of a permit issued under subsection (3).

As a result commercial guides and operators are not permitted to build or use informal fire sites.

When using fires guides should educate clients on the environmental effects of campfire use including damage to vegetation and aesthetic impacts and best management practices as outlined below. Guides shall ensure that damage to vegetation, ground cover or soils is minimized when using campfires in permitted locations.

1. Portable stoves, hibachis, or barbeques should be set up on durable, heat resistant surfaces and away from vegetation or litter wherever possible.
2. Supplied wood should be used wherever available
3. Where supplied wood is not available use fallen deadwood found on the ground for firewood; small standing deadwood under 2" in diameter is also suitable firewood.
4. Select wood of a size that may be broken or felled by hand; avoid the use of saws or axes except for splitting supplied wood at established campgrounds.
5. Avoid breaking off the lower dead branches of trees; if required remove the branch at the trunk ensuring that no unsightly or dangerous splinters remain.
6. Guides should ensure that fires are completely extinguished, including all embers and coals and are cool to the touch.

Aquatics Resources

Operators and guides should be aware that riparian areas are often susceptible to damage through trampling due to wet soil conditions. Locations close to natural water bodies are among the most popular and attractive visitor destinations in the mountain parks and contribute significantly to the visitor experience. Aquatic wildlife, groundwater and surface water resources and riparian areas are among the most sensitive ecosystem features that may be impacted by outdoor recreation activities. Environmental management and mitigation is focused on preventing direct damage to sensitive aquatic wildlife and riparian vegetation and preventing chemical contamination of water resources.

1. Guides should advise clients to bring their own water where feasible.

2. When group water resources must be refilled guides should select access points on durable materials or using crossing structures wherever possible.
3. Guides should avoid deviating from established trails and rest stops adjacent to streams and lakes unless durable surfaces or dry surfaces are used. Rest stops and campsites should be placed on high dry ground away from the waters edge.
4. Use bridges where available to minimize damage to stream banks at water crossings.
5. Use alternate travel routes to and from the waters edge to avoid the development of new informal trails.

Operators and guides should ensure that human waste is minimized and handled appropriately in the field to avoid visual and aesthetic impacts as well as to protect water sources from contamination.

1. Encourage outhouse use at trailheads before clients begin hiking.
2. Schedule rest stops where toilet facilities exist.
3. Where rest stop facilities do not exist, guides should carry a small spade, toilet paper, hand wipes, and plastic garbage bags to ensure proper disposal of human waste and garbage.
4. Bury solid human waste when possible at least 50m (165 feet) from watercourses in a cathole covered with between 10-15cm (4-6 inches) of mineral soil.
5. In areas where no active soil exists solid human waste should be covered but left near the surface to facilitate desiccation and dispersal.
6. Pack out toilet paper, hand tissues or any other personal human waste products.
7. Guides should schedule “bathroom breaks” at random locations before arriving at rest stops or scenic viewpoints to reduce visual and aesthetic impacts and to avoid concentration of potential contaminants in one location.

Operators and guides should take measures to prevent and minimize potential water contamination associated with human activities such as washing, bathing, and cooking.

1. Never deposit garbage, food wastes or wastewater refuse in streams or lakes.
2. Use biodegradable soaps for dishwashing and bathing when soap is necessary.
3. Bathe or wash away from water sources and avoid durable surfaces that lead directly to the water so that gray water may be absorbed and filtered by vegetation and soils before reaching any body of water.
4. Dispose of gray water by screening and/or removing all food particles, then dispersing at least 50m (200 feet) away from watercourses and sleeping areas.
5. Treat drinking water by filtering, boiling or use of iodine to prevent disease.
6. Store fuel in leak proof containers and use a funnel when pouring fuel from a container into a stove to reduce spillage.
7. Guides shall not dispose of excess fuel, food or materials anywhere in the backcountry – any excess food fuels or materials must be packed out and disposed of at an approved facility.

Cultural Resources

1. Educate clients about the value of cultural resources when at a cultural site.
2. Guides are responsible to ensure that clients do not remove any items from cultural sites nor vandalize the sites.
3. Guides are responsible to ensure that clients do not deface or write on rocks, outcrops, trees, logs or park infrastructure.
4. Do not rearrange cairns or add rocks to existing cairns.
5. Limit foot traffic to hardened trails in the area, if cultural sites are exposed as a result of trail braiding or the development of informal trails.
6. Report the discovery of an artifact or cultural site to Parks Canada – do not remove or otherwise disturb the site.

Visitor Experience

If commercially guided groups are large, they can have a negative effect on the perception of the environment and the visitor experience of other park users. Large group sizes and crowding at rest stops and viewpoints affects the aesthetic experience and feelings of solitude and remoteness that many backcountry visitors seek.

1. Operators shall comply with group size restrictions as per business licence stipulations, zoning and area management restrictions. Multiple groups must be separated by a minimum of 500 metres.
2. Guided groups do not have precedence over other groups. Guides shall act in a courteous manner towards other user groups on the trail and concede the right of way to smaller groups.
3. Where environmental impacts can be mitigated, guides should seek group consolidation, solitude and separation from other park users or groups at rest stops, viewpoints and campsites.
4. Guided groups should travel as a group within calling distance from the front to the back of the group. Guided groups should attempt to keep noise to a minimum.
5. Where feasible operators should try to minimize overcrowding by scheduling departure dates and times that avoid high use times. Guides should minimize overcrowding by managing the amount of time spent at high use sites.
6. Guides should pick up garbage and take reasonable measures to restore impacted sites that are encountered during the course of an excursion.
7. When requested, or when a perceived need arises, guides are expected to pass environmental management or interpretive information on to non-guided groups and to offer emergency or other assistance to non-guided groups when needed.

Campfire use can affect the experience of other visitors:

1. Guides should use dry seasoned wood that burns cleanly to limit the amount of smoke from campfires.

2. Guides shall refrain from burning food or garbage such as plastics that produces odours and harmful emissions. Partially burned items are not to be left in fire pits.
3. Campfires shall be kept small and noise around the campfire shall be minimized in campsites shared with other users.

Vehicle use can negatively affect the visitor experience:

1. Operators shall encourage car-pooling or provide shuttle van pick-ups for clients when possible to reduce pollution and vehicle congestion at trailheads.
2. Operators shall make use of existing shuttle services where they exist.
3. Operator vehicles shall be in good running order.
4. Operators and guides shall minimize idling of vehicles at trailheads and pullouts.

Best Management Practices for Horse Outfitters

In addition to the generic practices as outlined above, operators and guides involved in horse outfitting activities shall take additional measures to minimise the unique impacts of horse use in the backcountry.

Wildlife

1. In base camp situations in core grizzly bear habitat operators should consider the use of 4 strand electric fence to exclude bears from food storage and kitchen areas.

Vegetation

2. Operators should educate clients on the potential impacts of horse use and low-impact travel and camping practices specifically for horse users.
3. Operators and guides are expected to restrict horse use to established park trails at all times unless public safety is at risk.
4. In no circumstance shall operators or guides use existing informal trails or establish new informal trails.
5. Use light restraints or only restrain the “herd boss” in order to minimize concentrated impact on the vegetation.
6. Use solar-powered electric fences or hobbles to control horses while resting or grazing.
7. Follow park procedure with respect to feeding horses.
8. Provide lightweight equipment or require that clients bring their own lightweight equipment, including food, tents, and stoves to help reduce the number of horses needed.
9. Reduce the duration of stay at each site and keep groups as small as possible to disperse impact.
10. Concentrate horse related activities on hardened sites (corrals, hitching rails) and avoid creating new areas of soil compaction.
11. Guides shall instruct riders to stay on established trails and will concentrate horse traffic on one trail rather than contributing to trail braiding.
12. Guides shall control pack stock in areas susceptible to trail braiding.
13. Avoid using trails that have extensive wet areas or snow patches until later in the season when soils are dry and trails are clear of snow.
14. Avoid bringing salt or ensure that it is given to the horses over a tarp.

Aquatic Resources

1. Locate hitching rails and corrals away from surface water sources so that manure and urine do not enter the watercourse either directly or indirectly through runoff.
2. If feasible, water horses away from watercourses and access watercourses only over hardened surfaces, naturally unvegetated or previously disturbed ground.

Visitor Experience

1. Break up and spread manure at staging areas and campsites to facilitate drying and dissipation of smells.
2. Respect trails that are off-limits to horse use.

Best Management Practices for Winter Activities

In addition to the generic practices as outlined above, operators and guides involved in winter activities shall take additional measures to minimise the unique impacts of winter use in the backcountry.

Wildlife

1. Operators shall educate clients on the potential impacts of winter recreation and on minimum impact practices as applied to winter activities.
2. Operators should limit excursions in known areas of important lynx or wolverine habitat or winter caribou habitat.
3. Guides shall minimise the number of individual snowshoe or ski tracks established into an area.
4. Guides shall not follow wildlife tracks in order to ensure or enhance viewing opportunities.
5. Where feasible operators and guides shall avoid early morning or night trips to minimise impacts to nocturnal wildlife.

Visitor Impacts and Aesthetics

1. Guides shall ensure that groups move well off main trails or away from stopping areas for bathroom breaks. Latrine areas should be located in sites not likely to be traveled through by others, well away from water bodies and buried deeply when leaving.

Best Management Practices for Mountaineering

In addition to the generic practices as outlined above, operators and guides involved in mountaineering activities shall take additional measures to minimise impacts to sensitive alpine vegetation and to reduce the aesthetic impact of climbing activities.

Vegetation

1. Guides shall instruct clients on the sensitivity of alpine vegetation to trampling and disturbance.
2. Guides shall select routes and stopping areas on hardened surfaces whenever possible in alpine areas.

Aquatics/Hydrological Resources

1. Guides shall avoid trails that require fording as much as possible.

Visitor Experience and Aesthetics

1. Pack out feces from locations where proper disposal is not possible (e.g. glaciers, snowfields, big walls).
2. Use natural or removable protection equipment whenever possible.
3. Within the bounds of safety, guides shall minimise the amount of gear left behind at anchor or rappel stations.
4. When gear is to be left behind use dull or appropriately coloured bolt hangers, slings, or other gear.
5. Where possible and safe guides should place anchors discretely at the top of routes.
6. Use slings to protect trees used for anchors.

Best Management Practices for Overnight Activities

In addition to the generic practices as outlined above, operators and guides involved in camping and overnight activities shall take additional measures to minimise the unique impacts of overnight use in the backcountry.

Wildlife

1. Cooking, eating and supply areas shall be set up at least 100 metres from tenting areas. Designated backcountry campsites may already be arranged this way.
2. Dispose of dishwater in designated areas, or broadcast at least 100 metres from your sleeping area.

Vegetation and Soils

1. Operators and guides should make use of existing designated campgrounds and tent pads where possible, appropriate and available.
2. Concentrate tents and camp kitchens in areas that are established for these purposes or that are already impacted. Avoid making shortcuts between camps or kitchen areas.
3. Select campsites on durable surfaces. Disperse tents, avoid repetitive traffic routes and concentrate kitchen and tarp sites where possible on rock, sand or gravel or naturally unvegetated sites.
4. Do not “clean” sites of organic litter. Renaturalize campsites and rest stops when leaving by covering scuff marks, replacing sticks or branches, raking matted grasses etc.
5. Guides should monitor the impacts around campsites and move or rearrange camp as necessary to avoid permanent damage to vegetation or soils.

Best Management Practices for Sensitive Sites - Jasper

The following best management practices for sensitive sites apply to all guiding operations included in the scope of the Model Class Screening and operating in Jasper National Park.

Edith Cavell Meadows ESS

Parks Canada is actively involved in managing human use impacts in this popular day hiking area. Management actions include; closing the meadow as required to protect caribou rutting grounds in the fall and to reduce damage to vegetation from human use in the wet conditions of early spring; re-routeing trails as necessary to help protect the area's rare plant population; detailed rare plant surveys to determine the location, extent, and status of these populations; and closure of informal trails and paths (Parks Canada 2000a). These measures are expected to address the main issues related to human use impacts in the meadows. Guides and operators should contribute to minimizing impacts in the meadows area.

1. Operators should avoid promoting or scheduling trips for wet spring and early summer seasons or similar conditions.
2. Guides shall limit travel in the meadows (i.e., all areas at and below the upper loop), to established formal trails and established rest stops.
3. Guides shall restrict off trail travel and rest stops above the upper loop to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
4. Guides shall encourage clients to use washroom facilities before leaving the parking lot. The use of catholes or other waste disposal methods are not appropriate or acceptable in Cavell Meadows. Guides shall ensure that all solid human waste is packed out.
5. Mountain guides accessing the East Ridge of Mt Edith Cavell from Cavell Meadows trail shall use the same established route for each trip and limit the number of different paths or trails used.

Tonquin Valley Area

Parks Canada is actively involved in the management of human use impacts in the Tonquin Valley and surrounding areas. Management actions include: prohibiting development of designated trails in Moat Pass, Tonquin Pass, Vista Pass and Meadow Creek in recognition of their role as critical movement corridors for grizzly bears, and; determining the impact of horseback day trips in the Clitheroe and Majestic areas and the need for additional standards, monitoring, designated trails, or possible closures. In the interim operators and guides should attempt to minimize potential environmental impacts through diligent application of the standard best management practices. In addition to the best management practices, guides and operators using the Tonquin Valley area should implement the following practices to minimize impacts to vegetation and wildlife:

1. Guides should minimize human disturbance of caribou during calving and rutting periods and avoid caribou during the winter season.
2. Operators should avoid promoting or scheduling trips for wet spring and early summer seasons or similar conditions.

3. In the Amethyst Lakes area guides shall limit travel in the meadows wherever possible to established formal or informal trails and previously disturbed sites.
4. In the Amethyst Lakes area guides should endeavour to use the same established routes for each trip and limit the number of different paths or trails used.

Wilcox Pass

Mitigation for the Wilcox Pass area focuses on preventing impacts to sensitive alpine vegetation. In addition to standard best management practices commercial operators should implement the following procedures:

1. Operators should avoid promoting or scheduling trips for the wet spring and early summer seasons or similar conditions.
2. Where feasible, guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
3. Guides should endeavour to use the same established routes for each trip and limit the number of different paths or trails used.

Due to the uncertainty associated with the level of commercial use, new and expanded business licence applications in these areas will be assessed for additional site-specific and cumulative effects through the CSPR forms and business licence process.

Opal Hills/ Bald Hills

Mitigation for the Opal Hills and Bald Hills areas focuses on preventing impacts to sensitive alpine vegetation and reducing aesthetic impacts at trail summits and viewpoints. In addition to standard best management practices commercial operators should implement the following procedures:

1. Operators should avoid promoting or scheduling trips for the wet spring and early summer seasons.
2. Guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
3. Guides should endeavour to use the same established routes for each trip and limit the number of different paths or trails used.
4. Guides shall schedule bathroom breaks prior to arriving at trail summits or viewpoints.
5. Guides shall ensure that toilet paper and other human waste products are packed out and removed from trail summit areas.

Best Management Practices for Sensitive Sites – Banff, Yoho and Kootenay National Parks

The following best management practices for sensitive sites apply to all guiding operations included in the scope of the Model Class Screening and operating in Banff, Yoho, and Kootenay National Parks.

Cave and Basin Marsh Zone I Area and Vermillion Lake Wetlands - Banff

Despite being classified as a Zone I area, the Cave and Basin site often receives in excess of 10 000 visitors monthly in the summer. Guided hiking is limited to the Marsh Loop trail in the Cave and Basin Marsh Zone I area. The trail crosses habitat for the endangered Banff Springs snail and other aquatic life that flourishes in the warm spring water of the marsh. The snail has very specific habitat requirements and small changes in habitat parameters may have unknown or disastrous results for snail populations.

When operating in the Vermillion Lake Wetlands or the Cave and Basin Marsh areas guides shall:

1. Restrict all activities to established trails, boardwalks, viewpoints and rest areas.
2. Ensure that clients do not place hands and feet into the water or disturb aquatic vegetation and wildlife in any manner
3. Ensure that clients do not introduce foreign substances or chemicals to the water as small changes may negatively affect habitat parameters.

Fairholme/Carrot Creek ESS - Banff

The Fairholme/Carrot Creek area is identified as an area of concern through the vulnerability analysis conducted for the MCSR (Figure A3-7). Trails and facilities in this area have been decommissioned by Parks Canada and a voluntary closure is in place. Mountaineering access to Mt Peechee via Carrot Creek is expected to be limited.

1. Operators should refrain from promoting or booking any regularly scheduled excursions into this area.
2. Mountain guides are discouraged from using the Carrot Creek rockclimbing area.

Johnson Lake - Banff

Johnson Lake is a very popular day use area for hiking, sunbathing, swimming, canoeing and fishing. Commercial day use activity has increased in this area over the last several years. There are several sensitive sites in and around Johnson Lake that require additional mitigation. Muskrat Bay is a sensitive area for spawning rainbow trout and nesting waterfowl, particularly loons. The Beaver Pond wetlands to the north of the lake are also a sensitive site for nesting waterfowl. A wolf den is located not far from the east end of the lake. A historic cabin site is located off the main trail off the south shore of the lake. Heavy human use has resulted in damage to vegetation and the establishment of many informal trails especially along the south shoreline.

Operators and guides operating in the Johnson Lake area shall:

1. Avoid approaching the shoreline of Muskrat Bay, the adjacent inflow stream, or the beaver pond wetlands during waterfowl nesting season May 1 – June 30.
2. Avoid all off-trail travel along the north and northeast shoreline
3. Avoid the wolf denning site at all seasons and times.

Lake Louise Area - Banff

Most travel in the Lake Louise area is on well established trails with hardened surfaces and the area is managed by Parks Canada for high levels of visitor use. Operators are asked to use van shuttles, organize car pools or utilize public transportation where available to reduce vehicle congestion at parking lots.

The “back of the lake” rockclimbing area has become increasingly popular over the last several years and impacts from climbers in this area include the establishment of informal trails, the placement of permanent anchors, and an increase in human waste. Guides using the back of the lake should take great care to minimize their impacts through diligent application of the standard best management practices as well as:

1. Guides shall encourage clients to use washroom facilities before leaving the parking areas to reduce pressure on facilities at the back of the lake.
2. Guides shall ensure that clients use outhouse facilities provided at the back of the lake. The use of catholes or other waste disposal methods are not appropriate or acceptable at this site.

Paradise Valley/ Moraine Lake Valley - Banff

The Paradise Valley and Moraine Lake Valley (including the Consolation Lakes, Larch Valley and Eiffel Lake areas) located within the Lake Louise LMU function as important grizzly bear habitat. Bears in this area grow up in relatively close contact with humans and preventing habituation of bears is a continual management challenge. Additional mitigation in these areas for commercial guides is consistent with that applied to other users and is focused on minimising habituation and the potential for bear/human encounters.

Operators and Guides are expected to:

1. Comply with minimum group size restrictions as applicable.
2. Use the existing backcountry campground in Paradise valley and adjust climbing or hiking schedules as appropriate as opposed to utilizing bivouacs.
3. Use van shuttles, organize car pools or utilize public transportation where available to reduce vehicle congestion at parking lots.

Tunnel Mountain - Banff

The most significant ecological features in the Tunnel Mountain area subject to the impacts of commercial use are the hoodoos. These features are not durable and are prone to erosion. Guides using the Tunnel Mountain area should take great care to minimize

their impacts to vegetation and soils through diligent application of the standard best management practices as well as:

- Ø Guides shall restrict their groups to established trails and viewpoints in the hoodoos area. Off trail travel or activity is not appropriate or acceptable at the hoodoo sites.

Pipestone LMU – primitive designation - Banff

Helen Lake, Dolomite Pass and North Molar Pass areas in the Pipestone and Upper Bow LMUs are designated as primitive under the draft document titled “Human Use Strategy for Banff National Park” but feature relatively easy access to expansive alpine and subalpine environments and are popular destinations for both day and overnight users. High in elevation, the spring is late and summer season is short at these sites, with the result that vegetation and soils are often wet and prone to damage. Grizzly bear populations in these areas along with the adjacent Bow Summit area appear to be on the rise and bear/human encounters have recently become more frequent. Mosquito Creek and South Molar pass are also easily accessible and have been the locations of recent caribou observations. When using these areas:

1. Guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
2. Operators shall schedule trips to these areas so as to avoid wet spring and early summer seasons and conditions.
3. Where feasible operators should plan excursions for a minimum group size of six or more to reduce the potential for an aggressive bear encounter. Guides shall ensure that clients travel as a group for the same reason.

Burgess Shale Outcrops Zone I Area - Kootenay

The Burgess Shales Outcrops Zone 1 areas are relatively remote and for the most part see very low levels of human use at this time. The following mitigation will apply to guides working in the Burgess Shales area:

1. Commercial guides shall educate clients on the palaeontological values of the Burgess Shale and why some areas have been designated as Special Preservation areas
2. Commercial guides shall avoid taking trips through remote Zone 1 Special Preservation areas
3. Commercial guides shall report any incidental fossil finds
4. Commercial guides must not permit any removal of fossils from these sites.
5. Commercial guides should respect any fossil conservation zones designated by Parks Canada (Parks Canada 2000b).

Ice River Zone 1 Areas - Kootenay

This site contains a significant intrusive igneous complex that is exceedingly rare in the Canadian Rocky Mountains. Collection of igneous rock samples would constitute an unacceptable negative impact to the area. The Ice River Zone 1 area is relatively remote and sees only low levels of human use at this time.

1. Commercial guides shall educate clients on the cultural and historic values of this Special Preservation area.
2. Commercial guides must not permit the collection of rocks or other materials from the site.

Kindersley Summit

The Kindersley summit area is important spring and summer habitat for Bighorn sheep and for Grizzly Bears. Mitigation for this area focuses on reducing disturbance to Bighorn Sheep and on reducing the potential for human/bear encounters.

1. Operators shall avoid promoting or scheduling trips until after June 15 to avoid the sensitive lambing season
2. Guides shall restrict off trail travel and rest stops to existing designated sites or to hardened or durable surfaces on dry, well-drained ground.
3. Guides shall schedule bathroom breaks prior to arriving at trail summits or viewpoints.
4. Guides shall ensure that toilet paper and other human waste products are packed out and removed from trail summit areas
5. Where feasible operators should plan excursions for a minimum group size of six or more to reduce the potential for an aggressive bear encounter. Guides shall ensure that clients travel as a group for the same reason.

Burgess Shale Zone 1 Area - Yoho

Availability of commercial guiding licences for the well known Burgess Shale sites on Mt. Stephen and Mt. Field is limited to a single licence. Quotas and conditions are set out in the agreement with the Yoho-Burgess Shale Foundation. In addition to any business licence conditions or stipulations the following mitigation will apply to guides working in the Burgess Shales area:

1. Commercial guides shall educate clients on the palaeontological values of the Burgess Shale and why some areas have been designated as Special Preservation areas
2. Commercial guides shall avoid taking trips through remote Zone 1 Special Preservation areas
3. Commercial guides shall report any incidental fossil finds
4. Commercial guides must not permit any removal of fossils from these sites.
5. Commercial guides should respect any fossil conservation zones designated by Parks Canada (Parks Canada 2000b).

Ice River Igneous Complex Zone I Area - Yoho

This site contains a significant intrusive igneous complex that is exceedingly rare in the Canadian Rocky Mountains. Erosional impacts from trail hikers on the Ice River trail would likely be insignificant, but collection of igneous rock samples would constitute an unacceptable negative impact to the area.

1. Commercial guides shall educate clients on the cultural and historic values of this Special Preservation area.
2. Commercial guides must not permit the collection of rocks or other materials from the site.

Ottertail River Flats ESS - Yoho

1. Commercial guides must follow Parks Canada directions in focusing use on the existing Otterhead Trail and discontinuing use of the Van Horne trail beyond Otterhead Bridge (Parks Canada 2000b).

Best Management Practices for Sensitive Sites – Waterton Lakes National Park

The following best management practices for sensitive sites apply to all guiding operations included in the scope of the Model Class Screening and operating in Waterton Lakes National Park.

Maskinonge Wetlands Zone I Area

1. Guides shall limit activities to developed areas and not extend activities along the wetland shores or into the back wetland areas.

Upper Crooked Creek (Sofa) wetlands

There are no designated trails in this area. Commercial guiding activities and overnight use is prohibited.

Summit Lake-Carthew Lakes

Trail braiding and associated impacts are beginning to occur at various locations along this highly used trail.

1. Operators should avoid promoting or scheduling trips for wet spring and early summer seasons or similar conditions.
2. Guides shall limit activities to established formal trails, rest stops and routes.

Best Management Practices for Sensitive Sites – Mount Revelstoke and Glacier National Parks

The following best management practices for sensitive sites apply to all guiding operations included in the scope of the Model Class Screening and operating in Mount Revelstoke and Glacier National Parks.

Nakimu Caves-Cougar Valley Zone I Area

The natural features of Nakimu Caves and the premier grizzly habitat in Cougar Valley are protected by limiting access to the caves to a route over Balu Pass. Limiting access to the Balu Pass route also reduces the public safety hazard posed by grizzly bear activity in the Cougar Valley. Access through the lower Cougar Valley is not permitted during the summer season to protect bear habitat and during the winter the area is closed for avalanche control.

1. Commercial guides must respect closures implemented by Parks Canada.

Glacier House Cultural Site

1. Commercial guides must ensure clients stay on designated paths and use designated stopping areas to protect archaeological and cultural resources at the site.

Appendix 3:

Vulnerability Analysis

GIS Vulnerability Analysis

A landscape level GIS ‘vulnerability analysis’ was initiated as part of the identification of sensitive sites to provide an additional, objective verification of vulnerable areas as identified by parks staff, and to identify additional areas of concern. The vulnerability analysis utilized existing data sets and overlaid landscape parameters reflecting human use stress on wildlife, sensitivity of vegetation communities, significant ecological features, management purpose and levels of human use. The geographic output of the analysis identifies areas considered to be vulnerable to the potential impacts of commercial guiding activities when combined with other human uses.

The vulnerability analysis utilized existing park zoning information and analyses including Land Management Units, Park Management Plans Zoning, Ecoregions and Environmentally Sensitive Sites (ESS). Each of these layers were subjectively evaluated and ranked using a numerical scale related to the sensitivity to damage from human use.

Land Management Units (LMU’s) were rated numerically between 1 and 3 based on the effectiveness rating from the last park management plan. All LMU’s one standard deviation below their target rating were given a rank of 3, within 1 standard deviation as rating of 2 and exceeding by one standard deviation a rating of 1.

The Park Management Plans divide the parks into five land use zones, the ratings for each zone were applied as follows:

Park Service	0
Outdoor Recreation	1
Natural Environment	2
Wilderness	3
Special Preservation	4

Park management plans and the Report on Ecological Integrity both identify the importance of the montane ecoregion and the stresses this ecoregion is under. Ecoregions were classified on the relative level of vulnerability to human use; the greater the vulnerability the higher the numeric value. The ecoregions were classed as follows:

Roc, ice and water	0
Lower Subalpine	1
Upper Subalpine	2
Alpine	3
Montane	4

All environmentally sensitive areas (ESS) were given a ranking of 1.

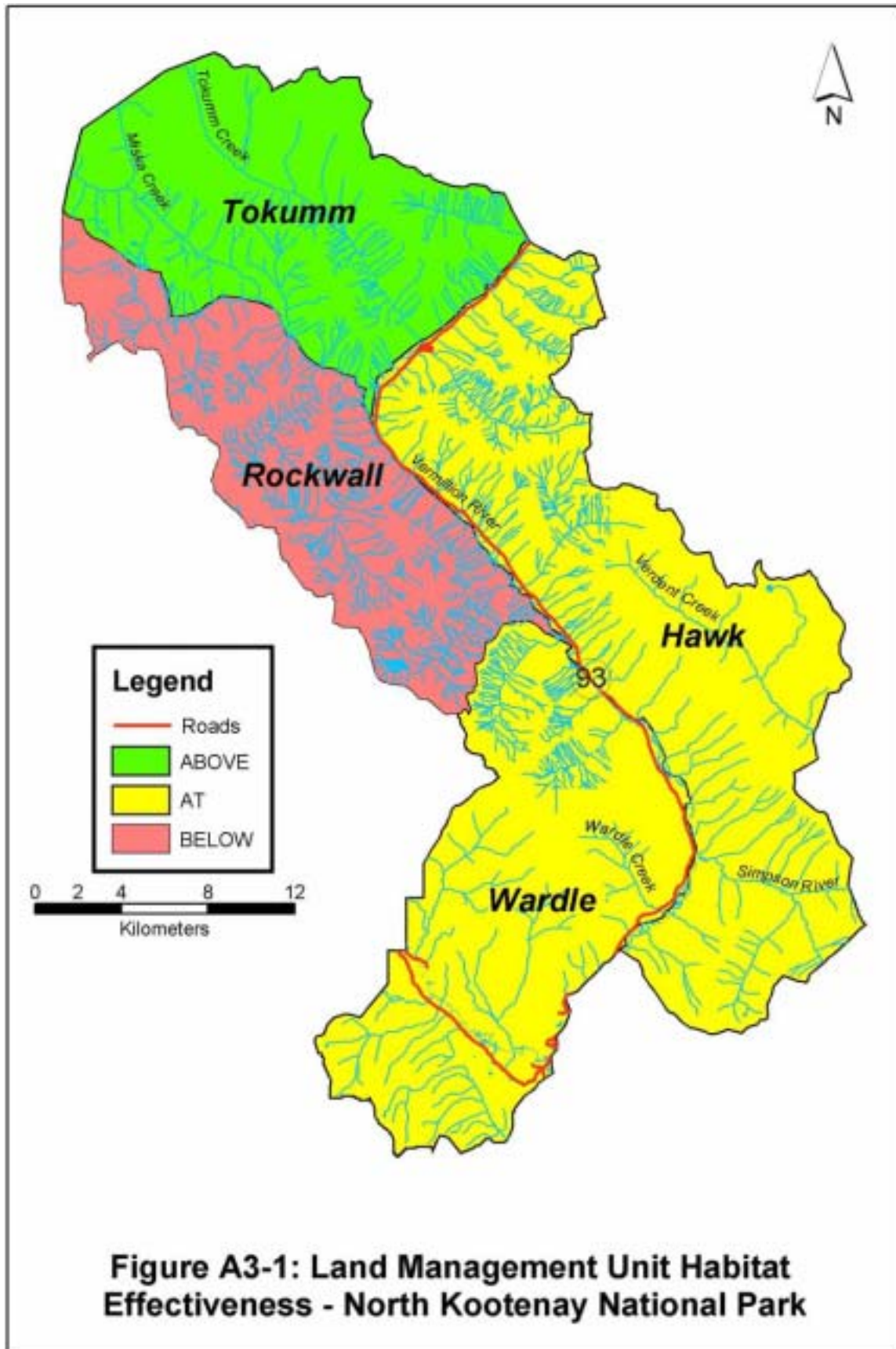
Each of the layers identified above are in polygonal coverages and were classified according to the above values. The polygons were then additively overlaid resulting in a new polygonal coverage with a value between 1 and 10. The numeric value of each

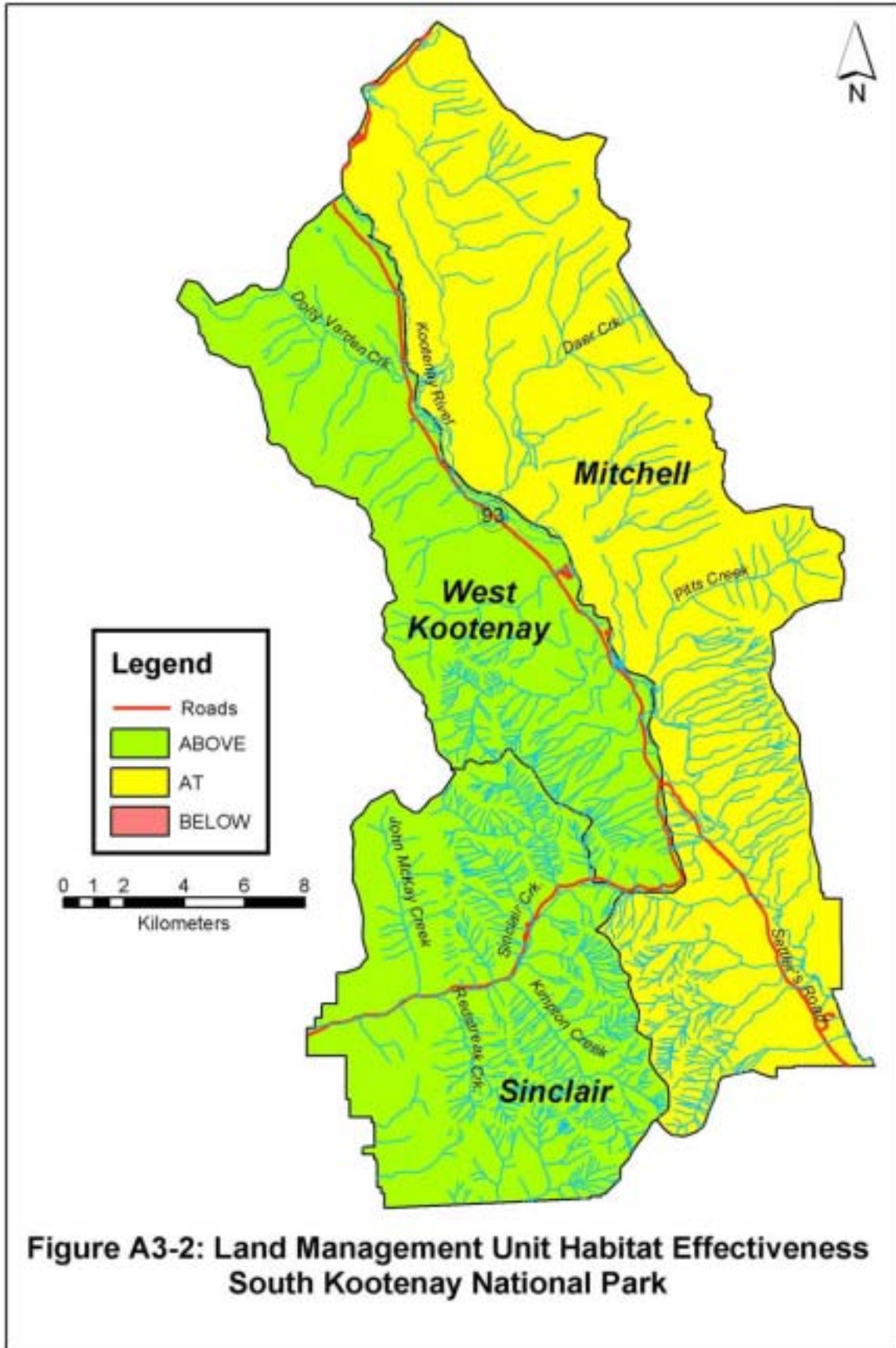
polygon signifies the relative importance of each polygon. Higher values indicate areas that may be considered to be the most sensitive to the effects of human use.

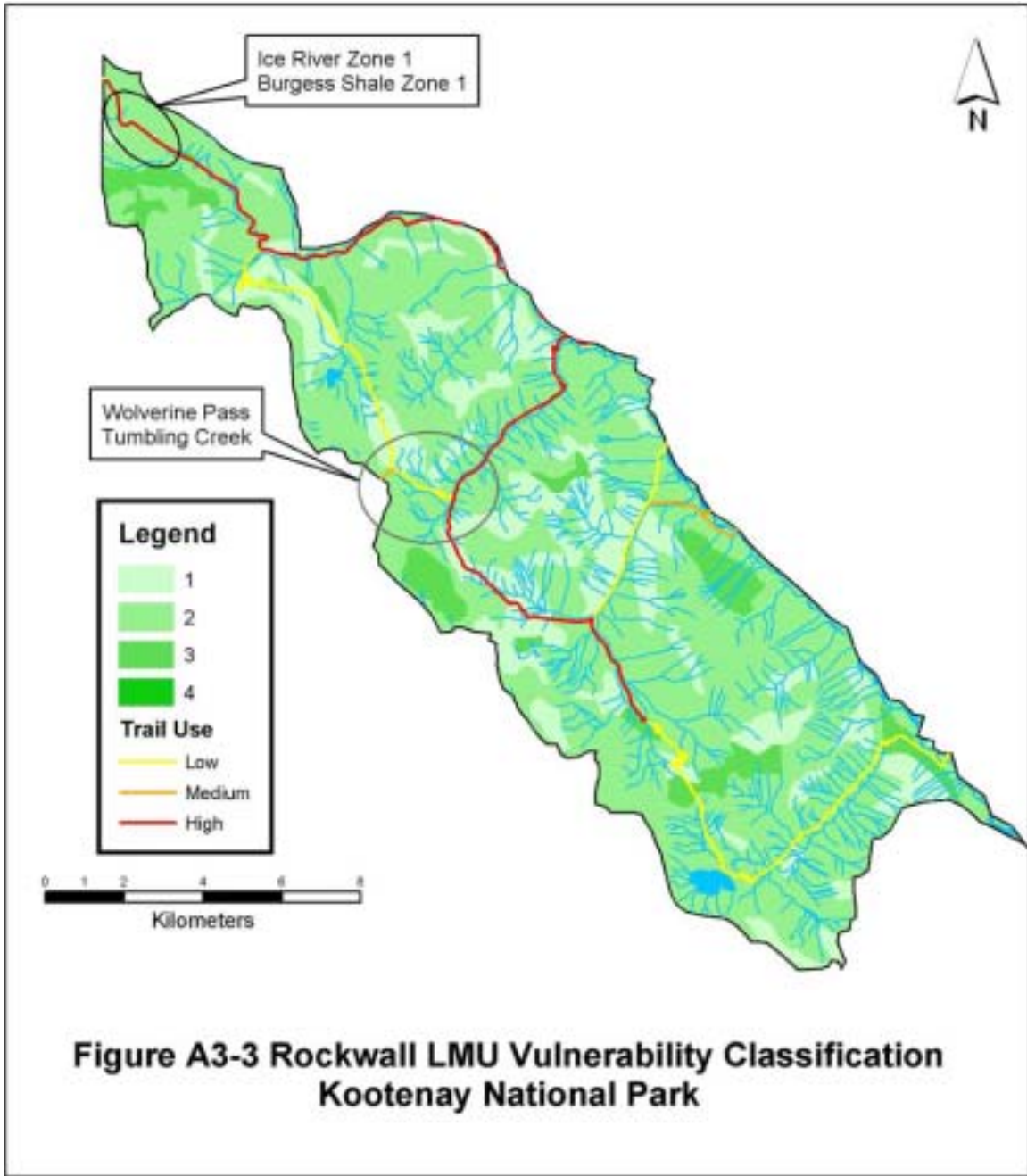
Trail use information for Banff, Yoho and Kootenay was also mapped and assigned a ranking of low, medium or high. Trail use data was not available for Jasper. Trail use was not numerically ranked but was simply overlaid to identify areas of high sensitivity and high human use.

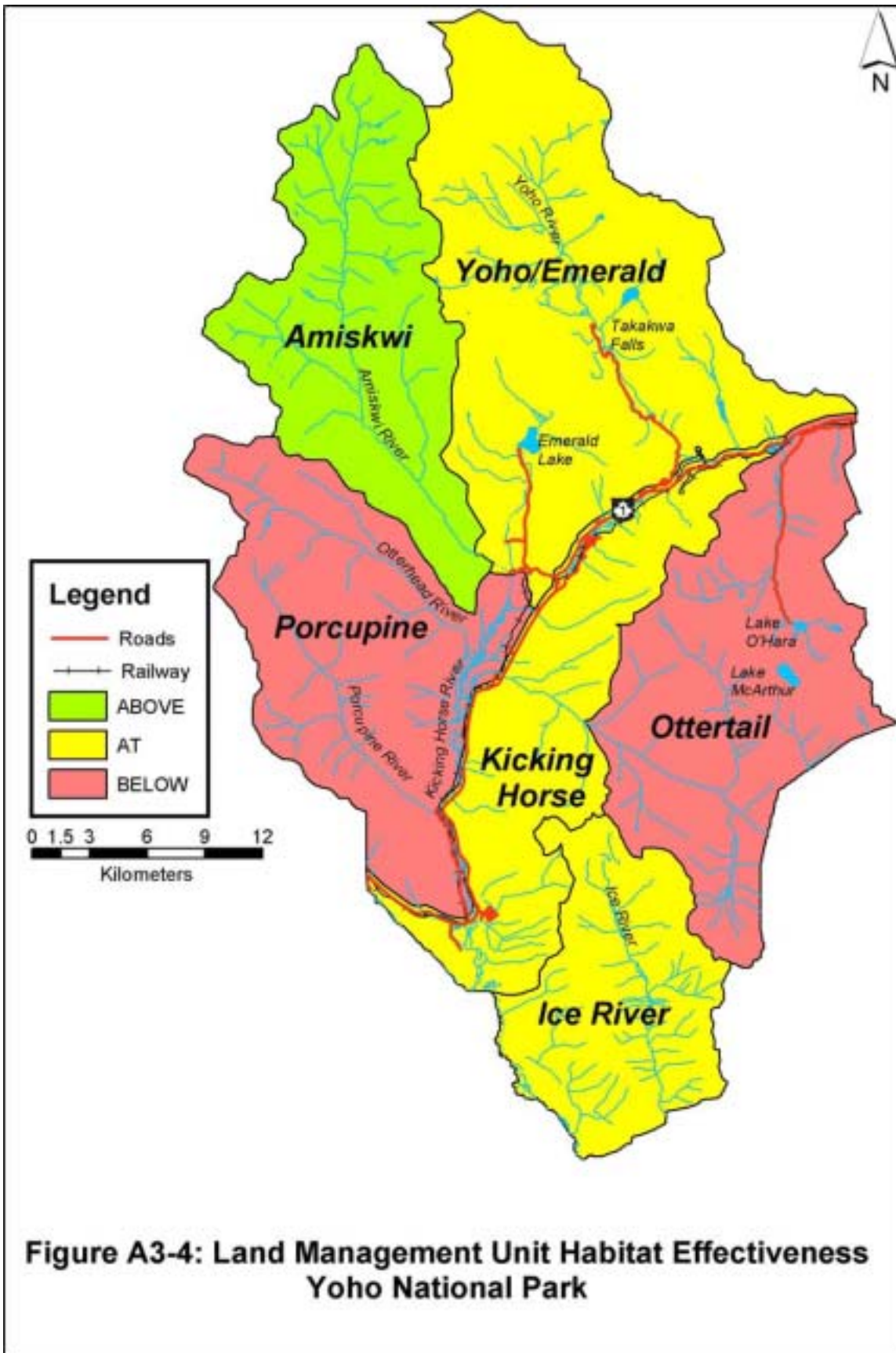
The vulnerability analysis is used in combination with information taken from park management plans, ecological land classifications, and consultation with park staff to identify areas that may be considered to be vulnerable to the impacts of commercial guiding activities. A vulnerable area is considered to be an area of environmental sensitivity combined with high levels of human use. Some areas of the parks are considered to be sensitive and yet are not identified as being vulnerable due to the low potential for human access or use. Some areas that are not that environmentally sensitive have been identified as vulnerable due to a high or growing potential for human use. The identification of vulnerable areas is used to flag areas for further consideration and assessment through the class screening project report and business licencing process. (Translators, please note the deletion in the paragraph above)

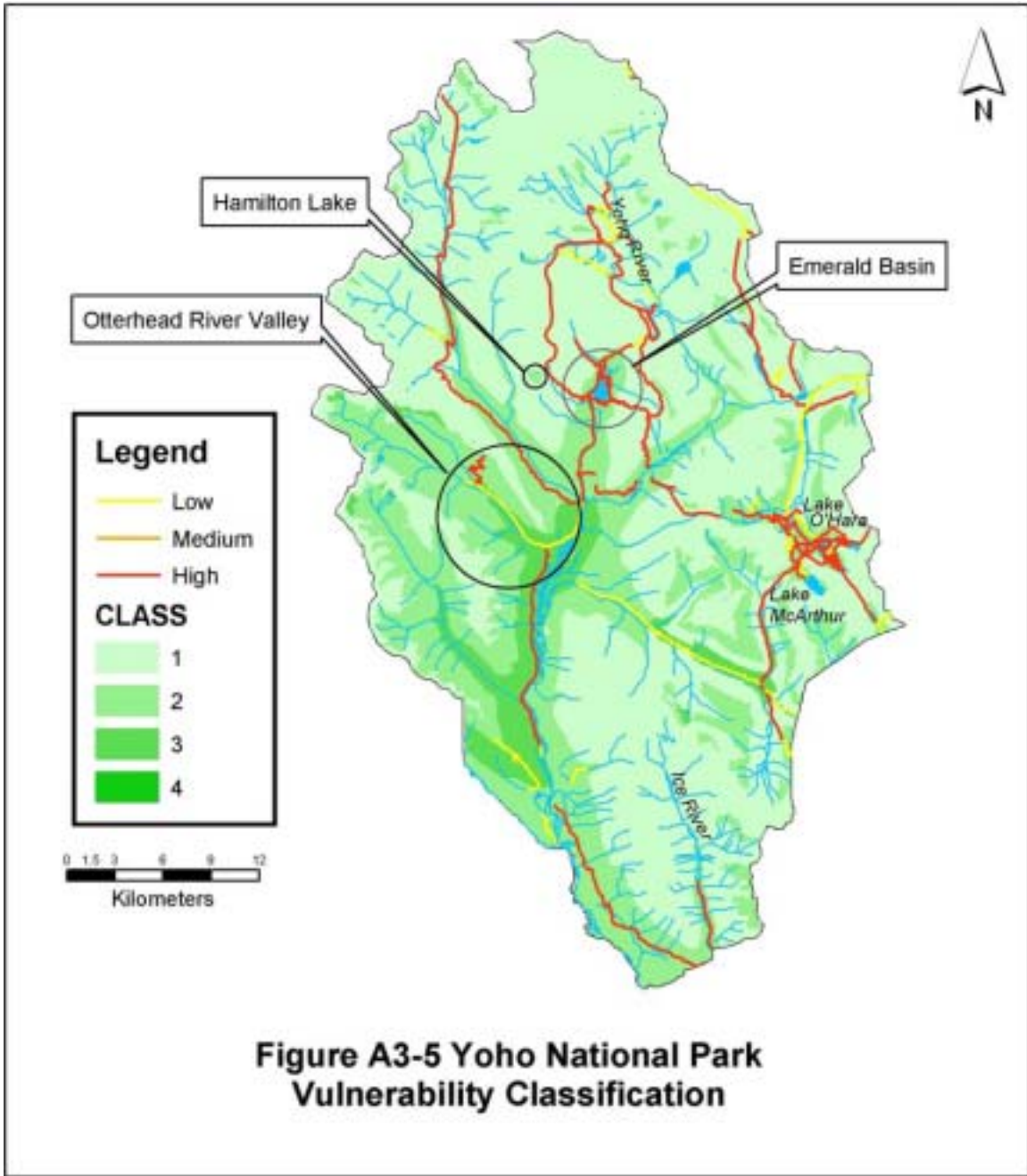
Preliminary checking of area rankings suggests a good relationship to known areas of concern. The inclusion of specific species habitat models within this model can be used to indicate the suitability of areas for use during different seasons.



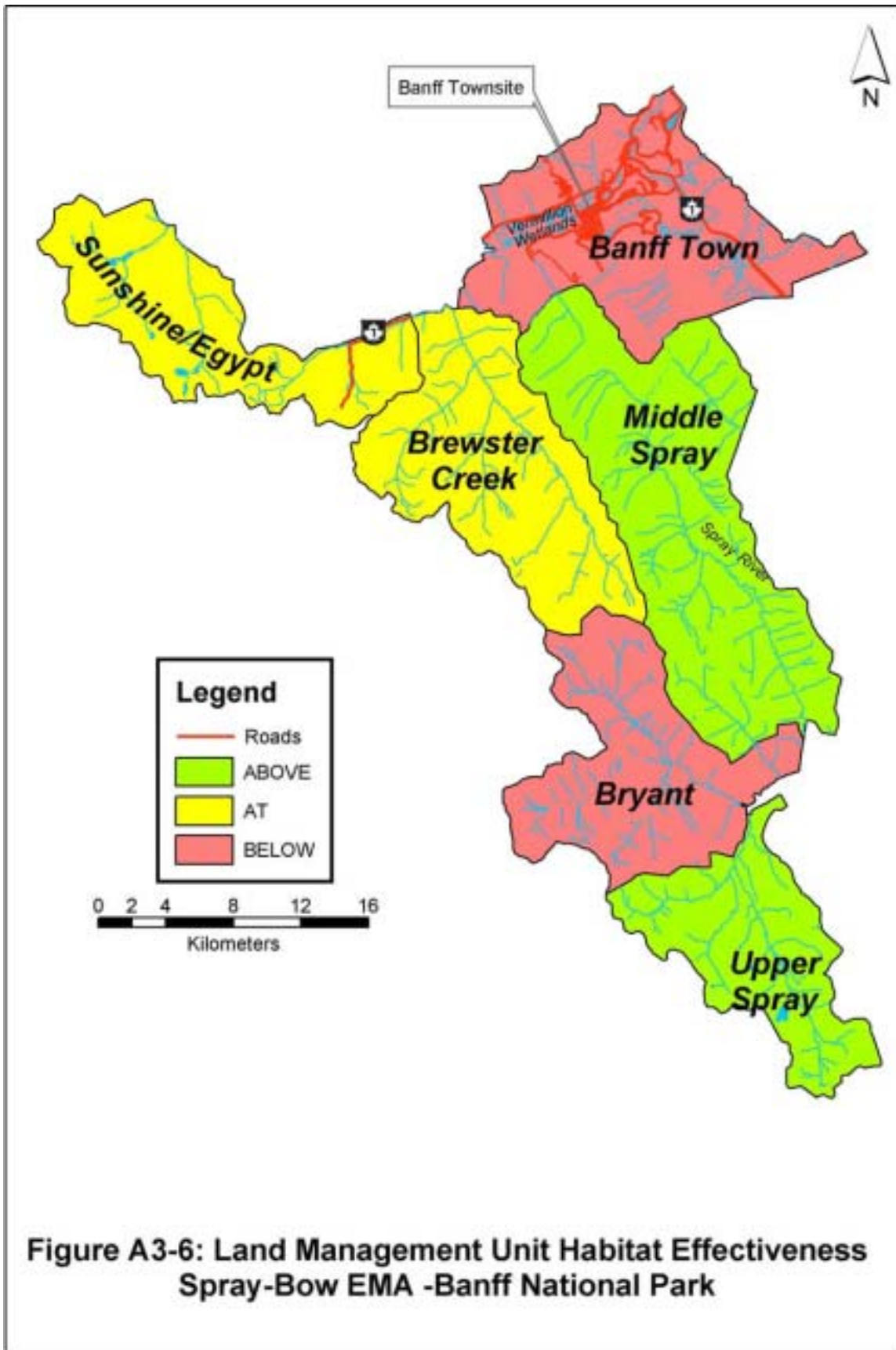




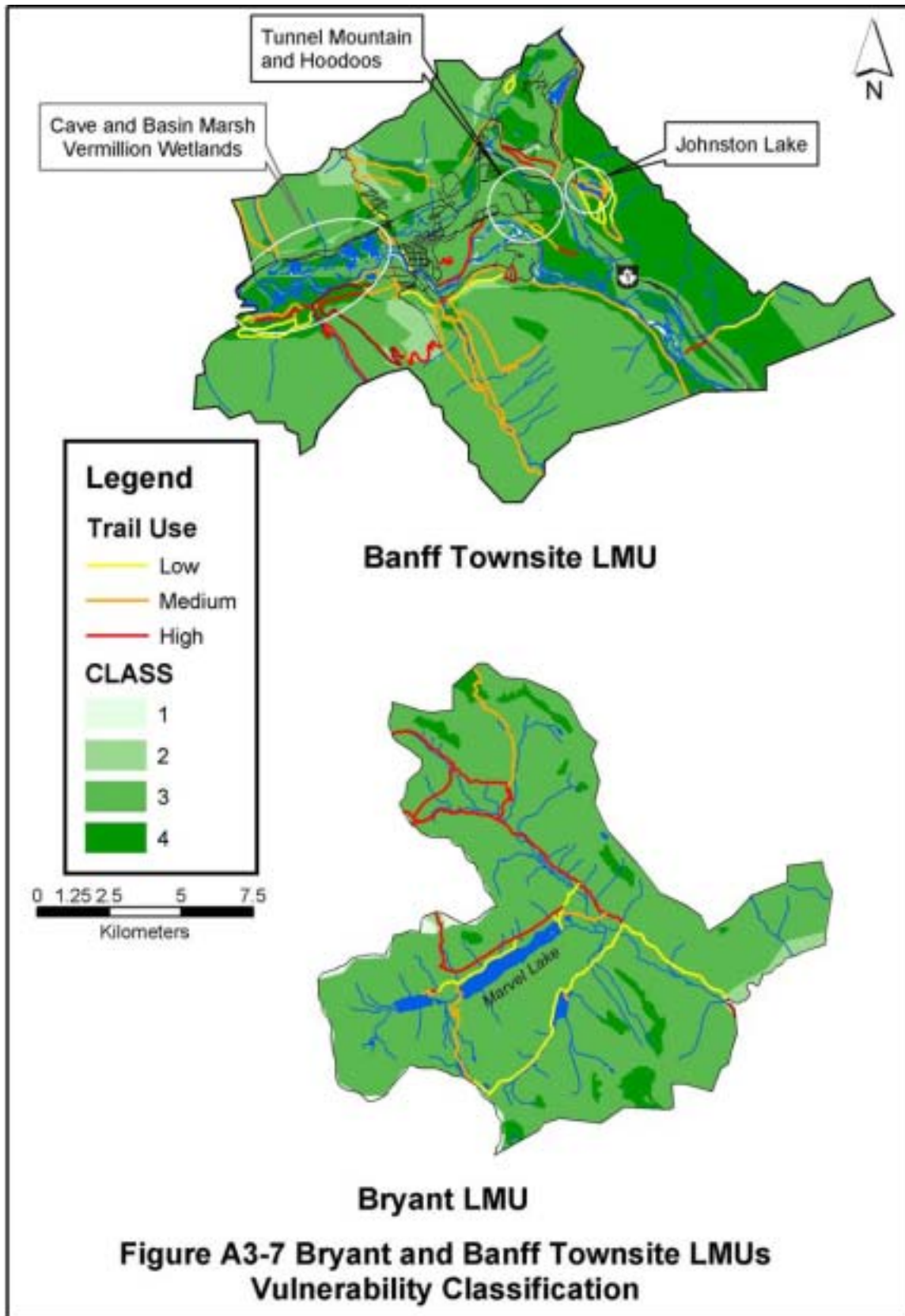


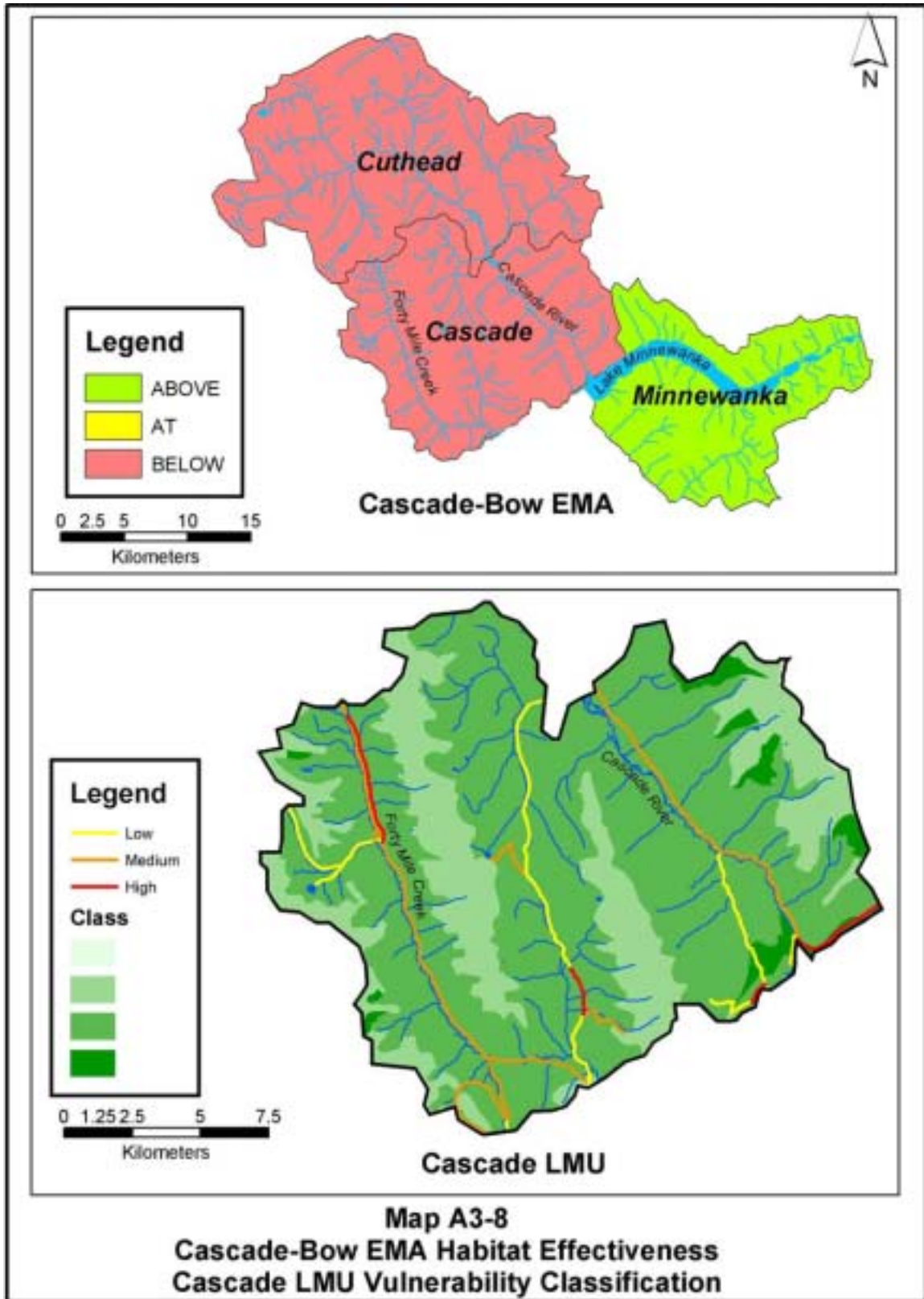


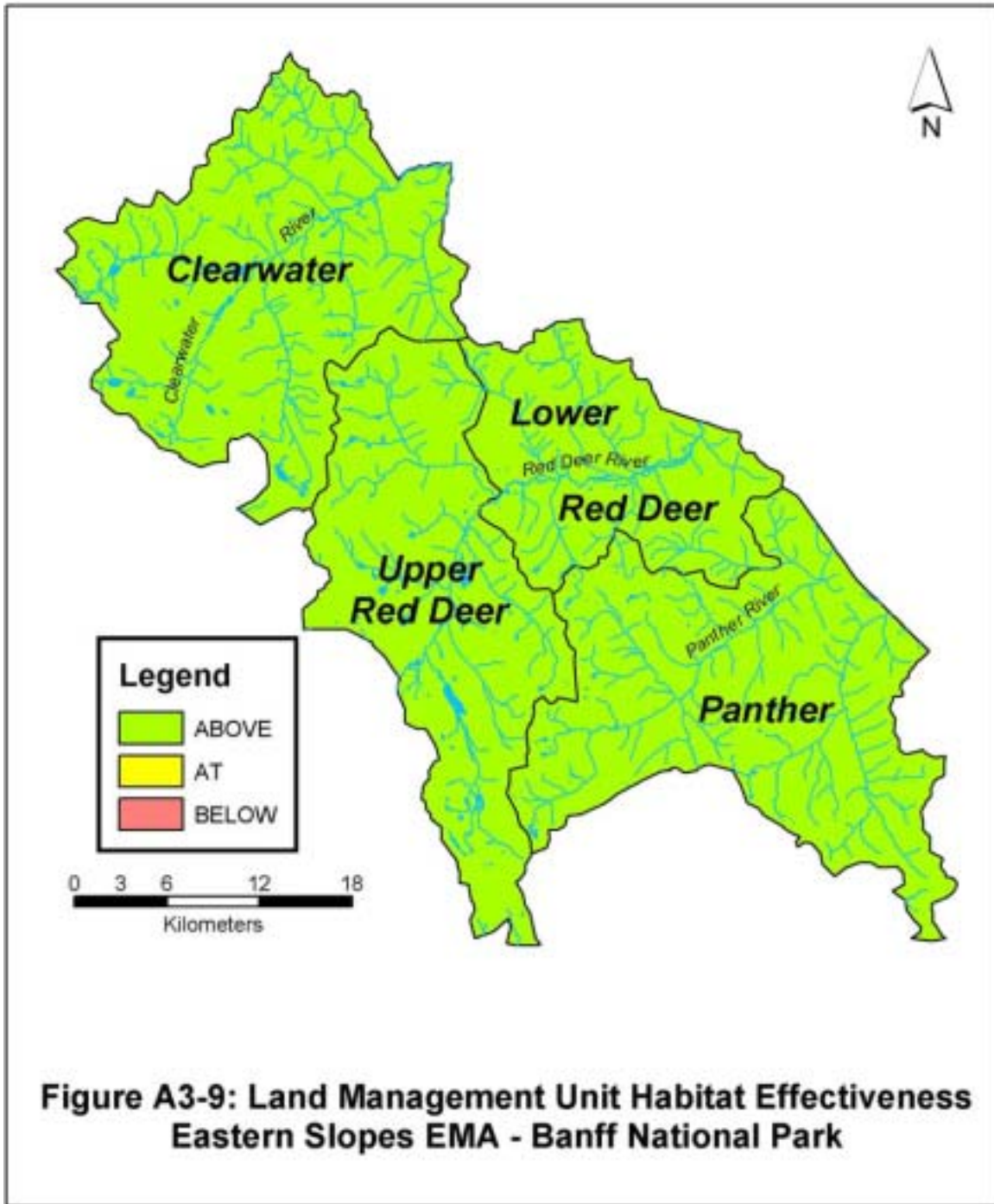
**Figure A3-5 Yoho National Park
Vulnerability Classification**

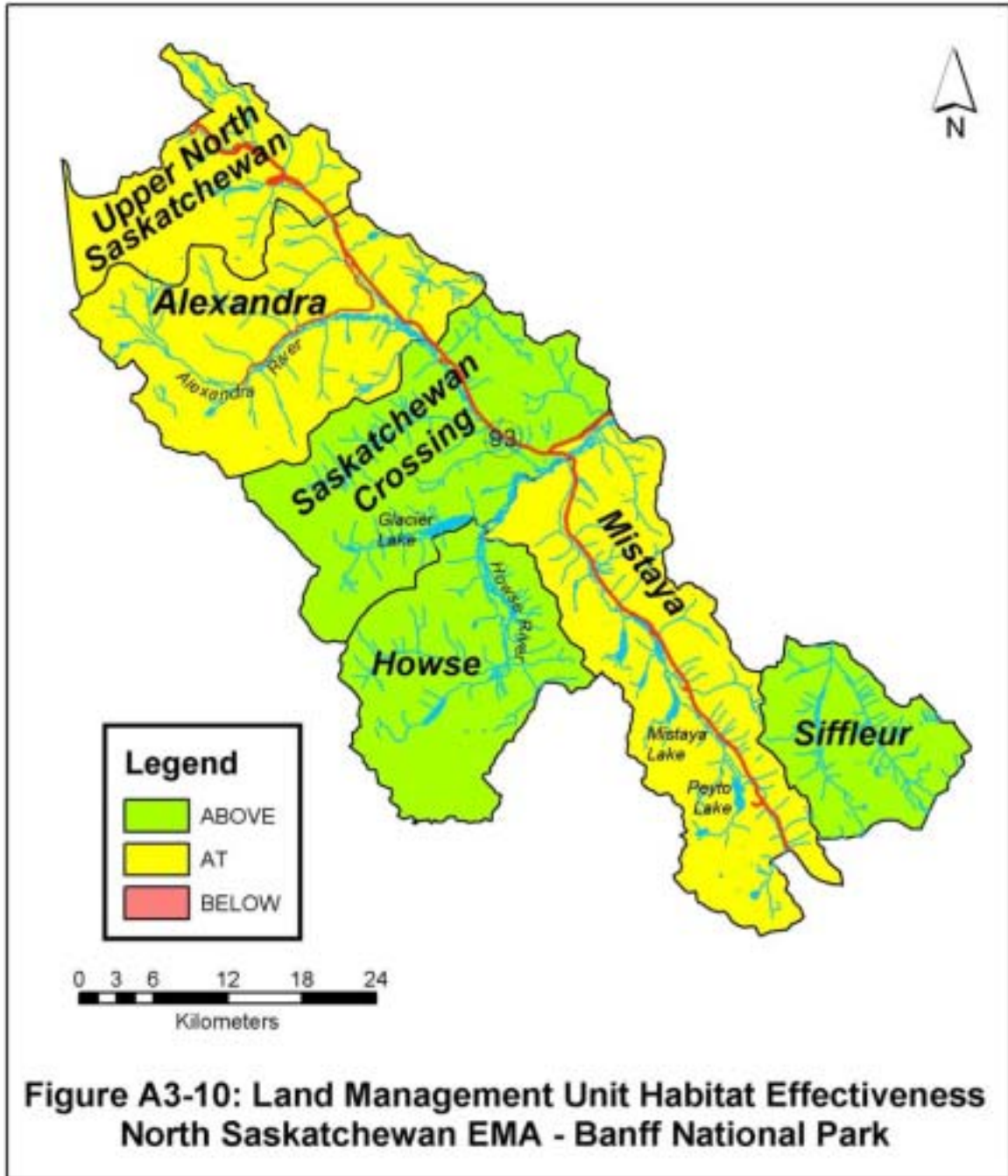


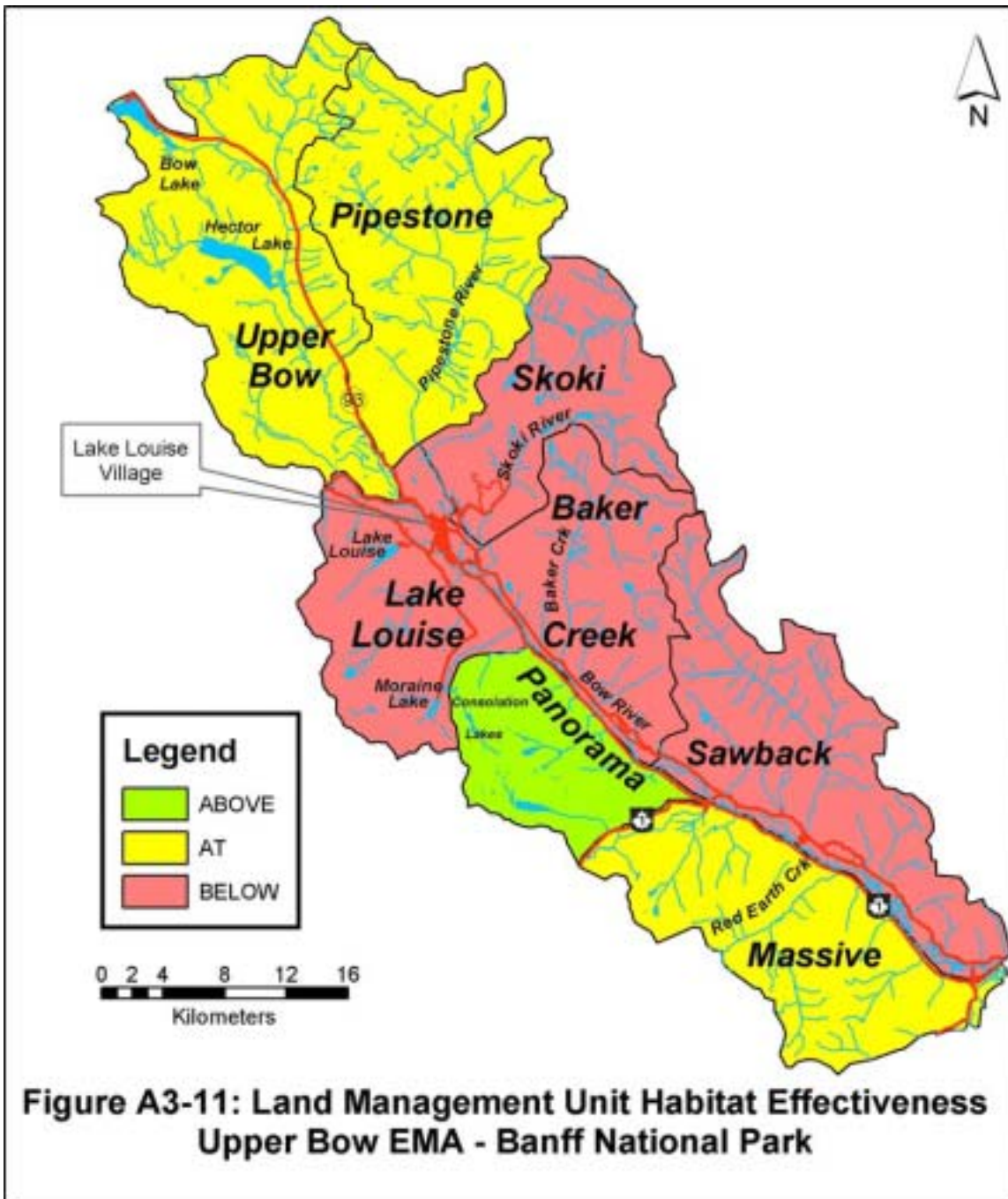
**Figure A3-6: Land Management Unit Habitat Effectiveness
Spray-Bow EMA -Banff National Park**

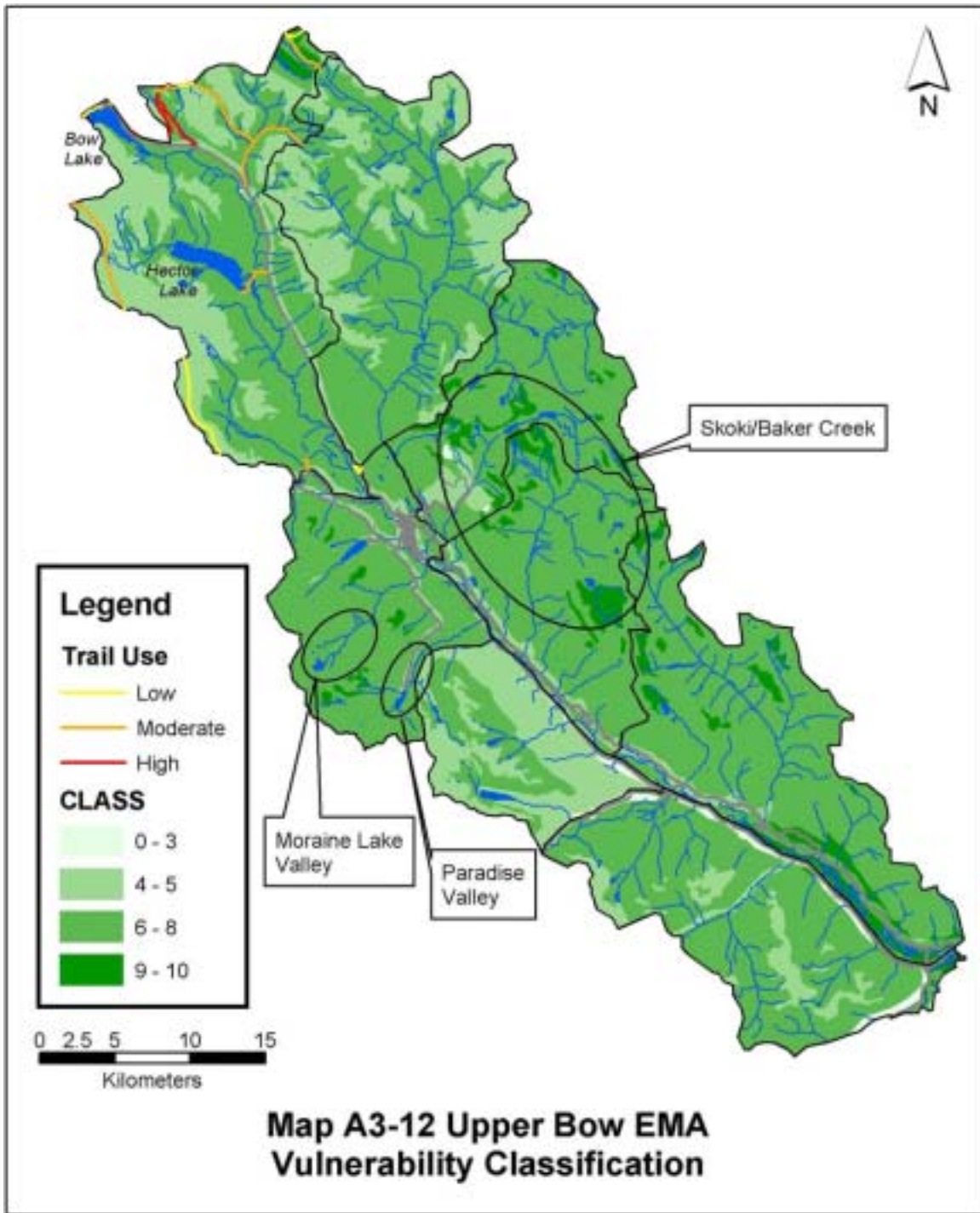


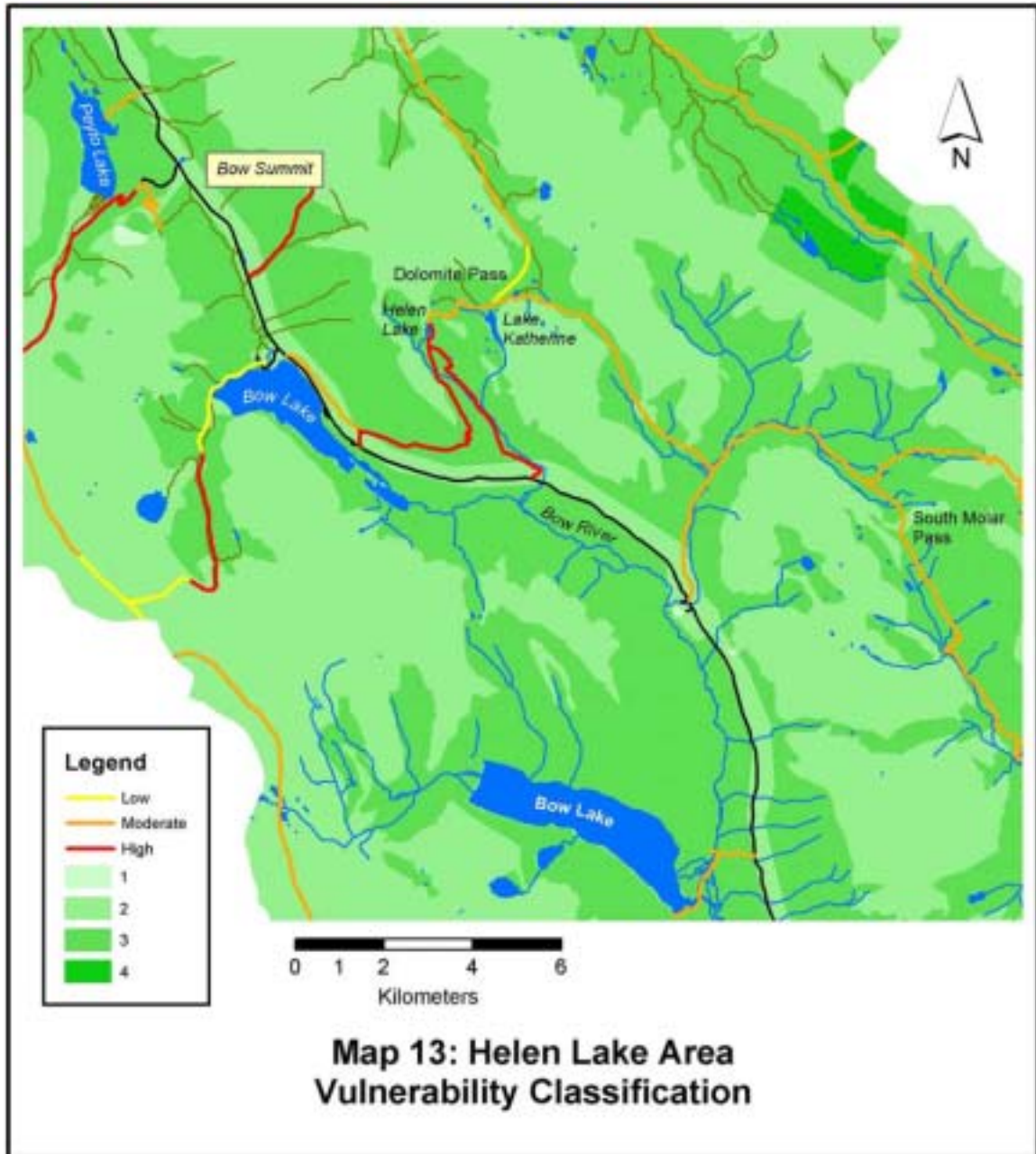


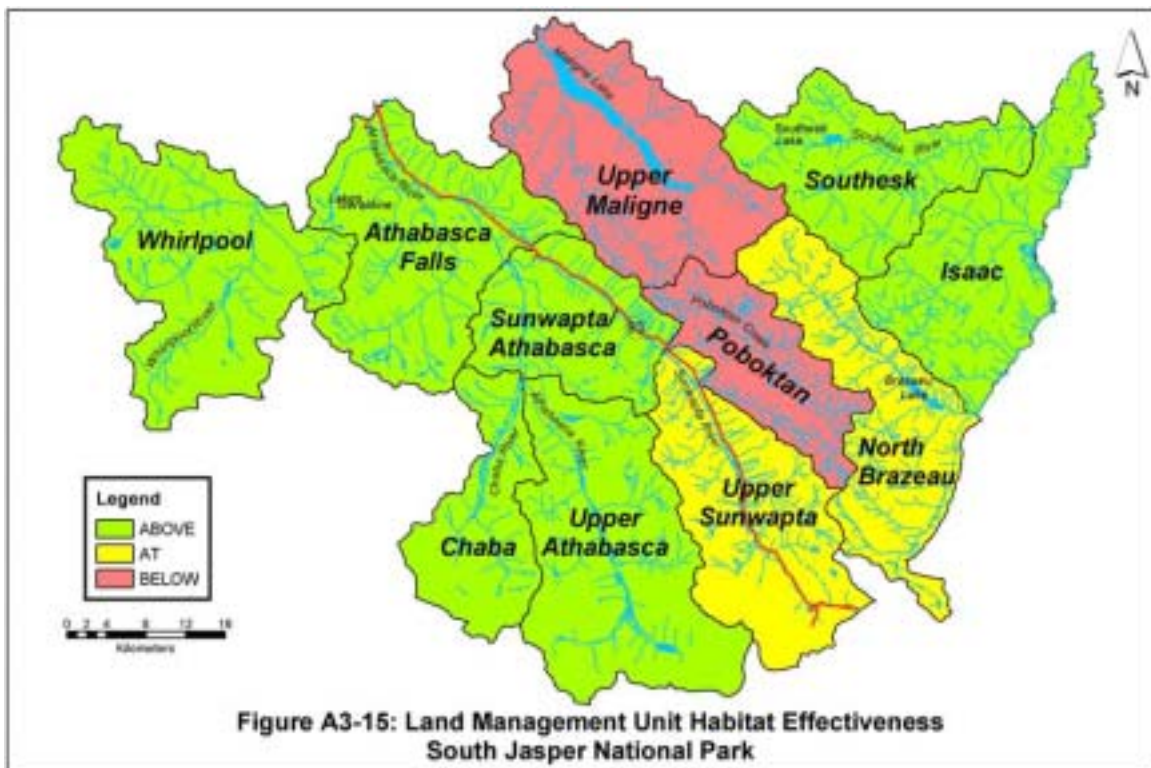
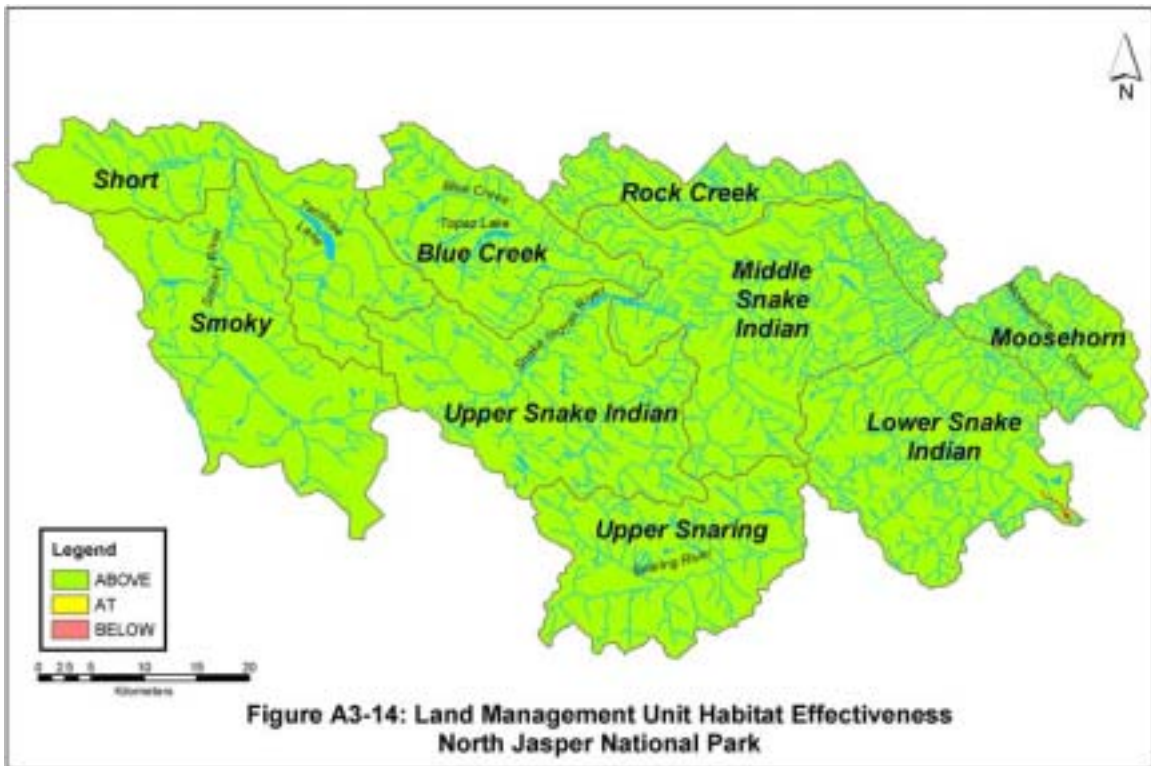


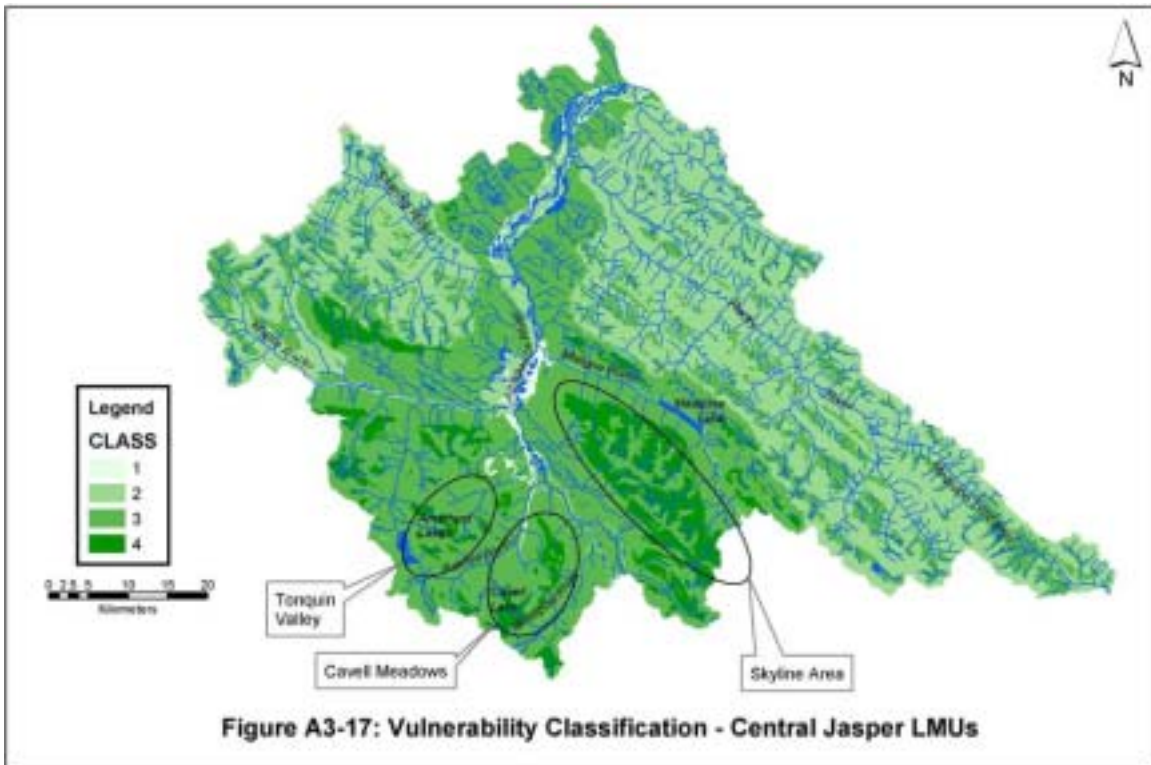
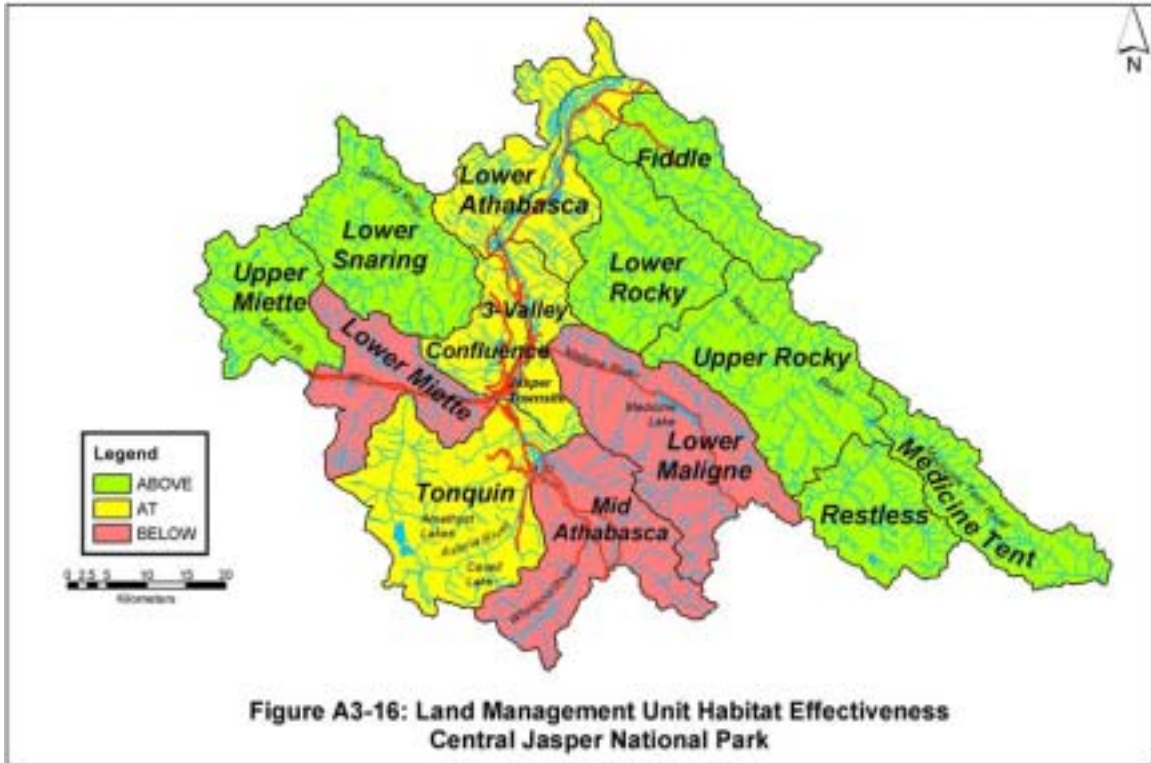


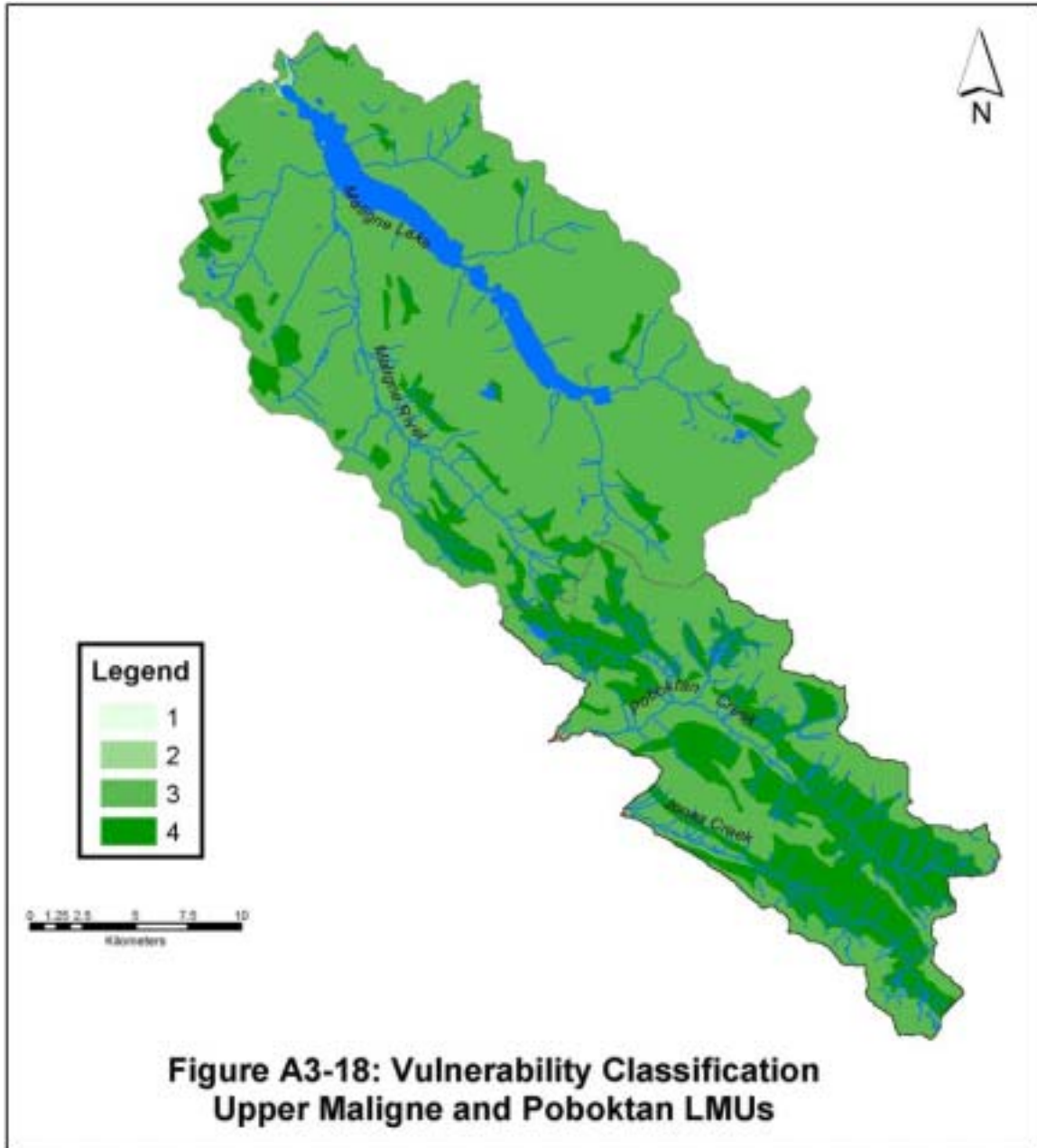












Appendix 4:

**Summary of Comments Received
Parks Canada Public Consultations**

27-Jun-03

Summary of Public Comments on the Draft Model Class Screening Report for Land-Based Commercial Guiding Activities

This summary of public comments received on the Draft Model Class Screening Report for Land-based Commercial Guiding Activities focuses on the identification and discussion of main themes and issues. The summary does not attempt to address all comments through a point-by-point discussion. The majority of comments have resulted in changes to the format and content of the Model Class Screening Report, or in changes to the Class Screening process itself.

Key issues and challenges related to the environmental assessment were identified appropriately

Several reviewers commented positively on the appropriate identification of key issues and challenges. An additional issue related to a lack of data on wildlife and wildlife habitat was added to the list. Some points were consolidated and clarified.

Standard mitigation measures were considered reasonable and effective

Most reviewers felt that the standard mitigation measures as outlined were reasonable and would be effective. Changes to mitigation measures were made in several instances that more effectively aligned mitigation with current environmental conditions e.g., Cavell Meadows, clarified the expected practices, or made some mitigation measures more enforceable.

The relationship between the Class Screening and business licence process was unclear

It became clear from reviewing a number of comments and questions received that the relationship between, and integration of, the business licencing and the Class Screening environmental assessment process was not communicated clearly in the Model Class Screening Report. This resulted in considerable organizational changes to the report that explain the process earlier in the document, add descriptive detail, and add flowcharts directed at more clearly communicating the integration of the two processes.

Not all activities have the same type or magnitude of impacts

Some concern was expressed by reviewers related to lumping the impacts of all land-based commercial guiding activities together in one environmental assessment. Mountain guiding operations for example, typically involve smaller group sizes than hiking or horse outfitting, and as a result the environmental impacts of mountain guiding activities may be less intensive. Parks Canada recognizes the potential difference in magnitude of the environmental impacts of individual activities, and changes were made to the text of the Model Class Screening Report to reflect this observation. Nevertheless, the types of impacts incurred by land-based commercial guiding activities are similar and are appropriately assessed together, particularly with respect to cumulative effects. The Class Screening process addresses activity-specific differences through the application of best management practices tailored to specific guiding activities.

Use and implication of vulnerability analysis is unclear

Some reviewers expressed concern or confusion over the use of the vulnerability analysis conducted for the Model Class Screening Report. The vulnerability analysis is used in combination with information taken from park management plans, ecological land classifications, and consultation with park staff to identify areas that may be considered to be vulnerable to the impacts of commercial guiding activities. A vulnerable area is considered to be an area of environmental sensitivity combined with high levels of human use. Some areas of the parks are considered to be sensitive and are yet not identified as being vulnerable due to the low potential for human access or use. Some areas that are not that environmentally sensitive have been identified as vulnerable due to a high or growing potential for human use. The identification of vulnerable areas is used to flag areas for further consideration and assessment through the Class Screening Project Report and business licencing process. Changes have been made to clarify the description and use of the vulnerability analysis in the text of the Model Class Screening Report.

Discussion of public safety issues should not be part of the Class Screening

The *Canadian Environmental Assessment Act* requires that Responsible Authorities consider the potential impacts of the environment on proposed projects as well as the potential impacts of accidents and malfunctions. In the case of commercial guiding activities, both these requirements are related to public safety issues. The draft Model Class Screening Report began to address these issues in the absence of clear direction provided through the business licencing process. However a review of the business licencing process was initiated and has been concurrently developed in conjunction with the Class Screening process. Requirements for best management practices related to public safety, including business plans, emergency plans, group size limitations, required certifications, and guide/client ratios have been removed from the Model Class Screening Report and will be more appropriately addressed through the business licence process approved by park managers.

The approach to Cumulative effects assessment is not appropriate and the cumulative effects assessment process is unclear

A concern was raised with respect to assessing cumulative effects at the individual project level and that cumulative effects should be addressed through larger scale assessments.

The *Canadian Environmental Assessment Act* requires that Responsible Authorities make a determination on the significance of cumulative effects on a project-by-project basis. In a Class Screening process, the Class Screening Project Report is used to assess and record the decision on project-specific and cumulative effects related to an individual project. The approach taken is consistent with that used in all other Class Screenings and consistent with advice provided by CEAA.

The park management planning process is the appropriate venue for consideration of large-scale cumulative effects. It was felt that the cumulative effects assessment process should be documented in greater detail in order to clarify how the assessment at the

individual project level links to the annual business licencing process, and how the annual business licencing process links to the parks management planning process. Changes made to the Model Class Screening Report include a more detailed explanation of the business licence process including the assessment of project specific and cumulative effects, a detailed explanation of follow-up monitoring and reporting requirements, and a detailed explanation of how the follow-up and monitoring results feed into the park management plan review process. The integration of management plan direction into the amendment and review process for the Model Class Screening Report is also documented

The integration of the Class Screening process, business licence monitoring, and park management planning processes will result in the ability to consider and assess cumulative effects related to commercial guiding activities at an appropriate scale and over appropriate periods of time.

Site-specific environmental descriptions are not detailed enough

A concern was expressed with respect to the level of detail provided in site-specific environmental descriptions. A greater level of detail is expected to result in additional site-specific mitigations that are tied to observable effects at sites where commercial activities are occurring. A number of examples were provided to illustrate these points.

Parks Canada maintains that the level of detail provided in site-specific environmental descriptions is appropriate considering the limited geographic extent of project impacts, the relatively low magnitude of individual project impacts, and the relative contribution of commercial guiding activities to overall human use impacts. Site-specific impacts occurring in the Parks are the result of combined commercial and independent visitor use. The separation of the impacts of commercial users from those of independent users is not possible. Through implementation of standard mitigation measures, commercial operators are already expected to operate at a higher standard than independent visitors.

The Class Screening focuses on the most relevant environmental issues by focusing on the sites of greatest concern in terms of potential impacts to ecological or cultural integrity. Providing more detailed environmental descriptions is not expected to result in information on impacts that can be attributed to commercial outfitters, or to result in the development of site-specific commercial guiding management practices that would effectively further mitigate impacts at sites where commercial activities are occurring.

Parks Canada expects that the standard activity-specific and site-specific best management practices as outlined in the Model Class Screening Report mitigation will be appropriate and effective in most circumstances. The CSPR process provides an environmental assessment tool for the identification and evaluation of additional site-specific environmental effects and mitigation.

The Class Screening does not identify Parks Canada mitigations or actions to address overall human use impacts

Issues were raised concerning expectations related to Parks Canada's obligations to manage the impacts of overall human use. Expectations expressed included mitigations to

control overall visitor use impacts, infrastructure improvements, and ecosystem restoration projects.

The human use strategies and parks management planning are the appropriate venues for addressing the impacts of overall human use. Park management plans address limitations or restrictions on independent visitor and commercial use as well as identify priority areas for ecosystem restoration and facility improvement.

Commercial operators need flexibility and should not be restricted to specified trails or areas

A number of comments were related to the need for flexibility in commercial operations. It is often difficult for operators to accurately predict the exact location and timing of tours in advance. Commercial operators need flexibility to adjust tour locations and schedules in response to weather and trail conditions, public safety issues and client demand.

Certain restrictions on commercial and recreational use of the mountain parks are currently set out and regularly updated in the various park management plans. Few areas of the parks are totally restricted to commercial use. Limits to commercial use are stipulated for some areas and may include restrictions on new licence approvals or limitations on total levels of commercial use. Restrictions on commercial use are generally associated with other park management activities designed to limit the overall impacts of human use.

The activity-specific and site-specific mitigation, which applies to all operators is expected to effectively mitigate the impacts of commercial guiding use in areas where unrestricted commercial activity is currently permitted. Any restrictions to commercial operator use arising from management plan direction or from environmental assessment considerations will be stipulated as a condition of the business licence. Otherwise, operators will have the flexibility to adjust their operations within their predicted range of activity.

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