Model Class Screening Report For Commercial Guiding Activities

In

Aulavik National Park of Canada,
Auyuittuq National Park of Canada,
Ivvavik National Park of Canada,
Kluane National Park and Reserve of Canada,
Quttinirpaaq National Park of Canada,
Sirmilik National Park of Canada,
Tuktut Nogait National Park of Canada, and
Ukkusiksalik National Park of Canada

Parks Canada Agency
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Canada

Model Class Screening Report for Commercial Guiding Activities in the Northern National Parks of Canada

Aulavik National Park of Canada, Auyuittuq National Park of Canada, Ivvavik National Park of Canada, Kluane National Park and Reserve of Canada, Quttinirpaaq National Park of Canada, Sirmilik National Park of Canada, Tuktut Nogait National Park of Canada, and Ukkusiksalik National Park of Canada

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Acronyms

CEA – Cumulative Effects Assessment

CEAA – *Canadian Environmental Assessment Act*

CEAR – Canadian Environmental Assessment Registry

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

LMU – Land Management Units

RA – Responsible Authority as defined under the *Canadian Environmental Assessment Act*

MCSR – Model Class Screening Report

The Agency – The Canadian Environmental Assessment Agency

WCSC – Western Canada Service Centre

1. Introduction

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 parks or areas of 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.

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 that would otherwise see lower use. Some, although not all, 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* (*CEAA*) of their current and projected future guiding activities. The class screening process under *CEAA* provides an efficient, effective, 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 commercial guiding activities for Aulavik National Park of Canada (hereafter Aulavik), Auyuittuq National Park of Canada (hereafter Auyuittuq), Ivvavik National Park of Canada (hereafter Ivvavik), Kluane National Park and Reserve of Canada (hereafter Kluane), Quttinirpaaq National Park of Canada (hereafter Quttinirpaaq), Sirmilik National Park of Canada (hereafter Sirmilik), Tuktut Nogait National Park of Canada (hereafter Tuktut Nogait) and Ukkusiksalik National Park of Canada (hereafter Ukkusiksalik).

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 to the environmental assessment of commercial guiding activities recognizes the benchmarks of ecological and commemorative integrity that are mandated to the Parks Canada Agency (Parks Canada) 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 policies 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".

Operationally, ecosystems can be characterized in terms of composition, structure and processes. 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 on 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 commemorative integrity which occurs when the resources that represent a site's importance are not impaired or under threat. 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 Parks Canada policies 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.

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*. Commercial guiding activities provide a number of benefits to park visitors, park staff and park residents including:

- Safe access for unskilled or inexperienced visitors;
- Visitor education on the physical, biological, and cultural resources and ecological integrity of the national parks;
- Outdoor skills development and safety training;
- Skilled resource pool for dealing with emergencies and rescues; and
- 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:

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

1.1.5. Cooperative management

All of the parks covered by this environmental assessment have a cooperative management agreement in place. These agreements provide formal mechanisms for Aboriginal involvement in park management. Usually a cooperative management board of Aboriginal and/or community representatives provides advice and guidance for management direction. The agreements also provide for access for Aboriginal people participating in traditional activities and subsistence harvesting (see individual agreements for details). As a result of these provisions, the use of "visitor" in this report does not refer to Aboriginal people covered by the land claim for that park. Another provision that is common in the agreements is for business opportunities in the park to be offered to Aboriginal people first or to have a certain percentage of licences reserved for Aboriginal people (provisions vary, please check the individual agreements for details).

1.2. Class screening and the *Canadian Environmental Assessment Act*

The *Canadian Environmental Assessment Act* (*CEAA*) and its regulations set out the legislative basis for federal environmental assessments. The legislation ensures that the environmental effects of projects involving the federal government are carefully considered early in project planning. *CEAA* applies to projects which require a federal authority (FA) to make a decision or take an action, whether as a proponent, land administrator, source of funding or regulator (issuance of a permit or licence). The FA then becomes a responsible authority (RA) and is required to ensure that an environmental assessment of the project is carried out under CEAA prior to making its decision or taking action.

Most projects are assessed under a screening type of assessment. A screening systematically documents the anticipated environmental effects of a proposed project, and determines the need to modify the project plan or recommend further mitigation to eliminate or minimize these effects. Screenings are conducted for projects which are not on the *Exclusion List Regulations* or the *Comprehensive Study List Regulations* and have not been identified as requiring mediation or an assessment by a review panel.

The screening of some routine projects may be streamlined through the use of a class screening report. This kind of report presents the accumulated knowledge of the environmental effects of a given type of project and identifies measures that are known to reduce or eliminate the likely adverse environmental effects. The Agency may declare such a report appropriate for use as a class screening after taking into account comments received during a period of public consultation.

A model class screening consists of two reports:

- A model class screening report (MCSR) that defines the class of projects and describes the associated environmental effects, design standards and mitigation measures; and
- A class screening project report (CSPR) that describes any additional information (e.g. environmental effects, design standards and mitigation measures) needed for each project assessed under the MCSR, and concludes on the significance of environmental effects of that project.

The commercial guiding activities addressed through this class screening have many common characteristics. 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. Model class screening and the project class

Guided activities are a well-defined class of project. They are all similar in that the business licence involves an authorization to operate a business offering guided activities in a national park. Although covering many different activities, the activities all involve guiding visitors on an experience in a northern national park.

Guided activities take place in well-understood environmental settings, that of national parks. Guided activities often follow similar routes and rivers, making the environmental setting more predictable on a local scale.

Guided activities are unlikely to cause significant adverse environmental effects, taking into account mitigation measures. These activities have the potential to only impact the environment in small ways. Given the common characteristics of these activities and minimal impacts after mitigation is implemented, the adverse environmental effects are not likely to be significant.

Guided activities do not require follow-up because there is no new/unproven mitigation measures, the setting is familiar, and no new technology is being used.

Guided activities are subject to the management planning process as established by the *Canada National Parks Act*. This process is used to provide management direction for all activities within a national park and address cumulative effects at the park scale. The management plan can set limits or restrictions on commercial guiding activities if they

are necessary to protect ecological integrity or visitor experience. All projects are required to comply with management plan directions and restrictions.

Public concerns are unlikely because the management planning process includes an extensive public consultation program and provides the management context for this activity.

Furthermore, these activities take place on federal land administered by Parks Canada and do not require any other authorization from another federal department. As a result, federal referrals will not be necessary. As demonstrated in the sections that follow, no listed species in the *Species at Risk Act* will be negatively affected by the activities assessed by this MCSR.

1.4. 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 mitigation. However site-specific environmental concerns exist that may not be mitigated through standardized mitigation. 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 a portion of the activities taking place within the 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 patterns of visitor use in some 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. However, ongoing patrolling by wardens and interaction between Parks Canada staff and visitors provides sufficient qualitative information to make this assessment.
- There is a lack of information on the ecology of many of these parks because of their relatively recent designation. There is also a lack of information on the effects of human disturbance on the sensitive arctic ecosystems. Relatively little research on recreational impacts has been conducted in the arctic environment; therefore, typical impacts in other ecosystems need to be extrapolated to this environment. However, the formal research and information about these parks is still greater than most other northern locations. In addition, extensive experience of Parks Canada staff in these parks provides sufficient informal qualitative knowledge to conduct the assessment.
- 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. This challenge will be addressed through the integration of the management planning process with the cumulative effects analysis.

- 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. This challenge is addressed through the use of the CSPR to identify any recent or site-specific concerns and through the adaptive management approach to cumulative effects identification and management.

The class screening process for commercial guiding activities has been developed to address the requirements of the *Canadian Environmental Assessment 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 northern 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; and,
- Is consistent with *CEAA* and with management direction provided by the *Canada National Parks Act*, Parks Canada's policies and park management plans.

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 licensing 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 *CEAA.* 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 licensing 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 licensing process can be divided into three stages as illustrated in Figure 1:

- licence pre-screening
- licence application and review
- monitoring and annual reporting

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

1.5.1.1. 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.

1.5.1.2. 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 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 licensing 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 *CEAA*. Both the licence application and the environmental assessment must be completed and reviewed by business administration, public safety and environmental assessment staff of Parks Canada prior to proceeding to the next stage. Licence applications are received and reviewed by Parks Canada staff in the spring of every year. The review includes the identification of additional site-specific issues and mitigation, the identification of cumulative effects issues and mitigation, and potential impacts to park facilities, budgets and public safety. 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.

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 by the park superintendent. Additional stipulations and mitigations may be attached to the business licence for an individual operation to deal with site-specific or cumulative effects, or other operational concerns as required. A recommendation will be made to the park superintendent with respect to licence approvals.

1.5.1.3. Annual reporting and monitoring

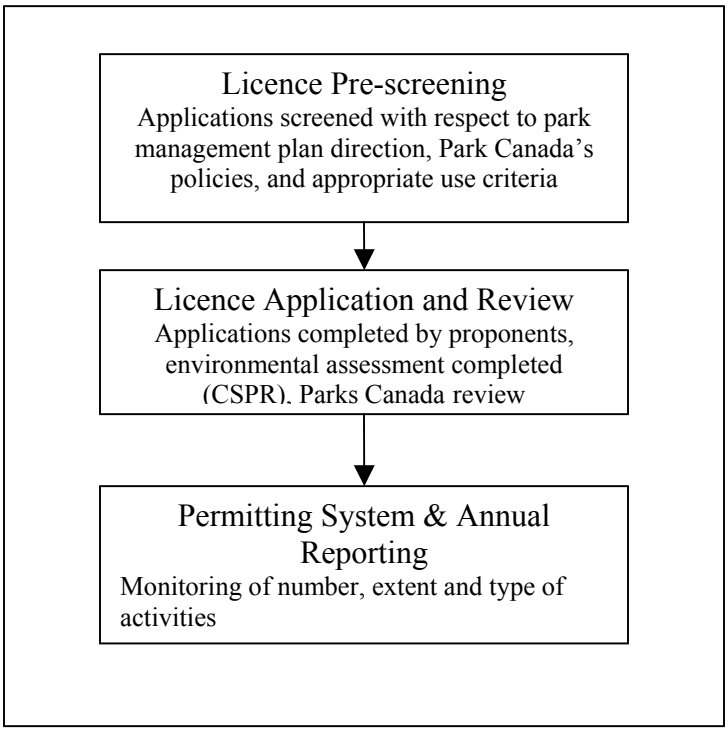
Annual monitoring of multi-day use in Aulavik, Ivvavik and Tuktut Nogait occurs through a permitting system that tracks all parties. As a result, business licence holders offering multi-day trips in these parks are not required to submit annual reports. However in the other parks, annual reports are used to collect information on the number, location and size of excursions.

For all parks, business licence holders who fish during their trip must report the catch (species and approximate size) of fish after each trip. Bear sightings must also be reported after each trip. 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 Parks Canada 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 Regulations*, 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 would not require a new or updated environmental assessment until the scheduled five-year management plan review. Every five years following the completion of the park management plan review in each park, all commercial guiding operations would be re-evaluated and notified with respect to the need for a new or updated environmental assessment.

Figure 1: Business licence process overview



1.5.3. Class Screening Project Report

The Class Screening Project Report (CSPR) functions as the environmental assessment documentation for business licence applications that are assessed using the class screening process. Sections of the CSPR that document the proposed business activities are completed by the applicant. Sections of the CSPR 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 identifies the potential for effects to species at risk.
- Section 7 describes any monitoring or follow-up that is required.
- Section 8 records the decision statement and signature of the Responsible Authority.

1.5.4. Roles and responsibilities

Parks Canada is the sole responsible authority under *CEAA* as well as the sole business licensing authority in 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 appropriately 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.

1.5.5. Other environmental assessment regimes

As a result of land claim agreements, additional environmental assessment regimes have been put in place in all of the parks included in this MCSR. Tuktut Nogait, Aulavik and Ivvavik are within the Inuvialuit Settlement Area. Therefore *The Western Arctic Claim: The Inuvialuit Final Agreement (*IFA) (Indian and Northern Affairs Canada 1984) requires an environmental assessment in Aulavik and Tuktut Nogait for “every proposed development or consequence to the Inuvialuit Settlement Region that is likely to cause a

negative environmental impact" Section 13(7). Any "development activity" proposed within the Ivvavik must undergo an environmental impact screening under the IFA. Business licences covered by this MCSR are required to undergo an environmental assessment through the IFA process as well.

Kluane is within the jurisdiction of the *Yukon Environmental And Socio-economic Assessment Act* (YESAA) which was given Royal Assent May 13, 2003 and came into force on November 13, 2004; however, the YESAA environmental assessment process will not be applied in the Yukon until the regulations are in place. Therefore, prior to the YESAA regulations the Canadian Environmental Assessment Act (the Act) will apply and following implementation of the regulations YESAA will apply in Kluane.

Auyuittuq, Quttinirpaaq, Ukkusiksalik and Sirmilik are all within the Nunavut Settlement Area. As a result, all project proposals submitted to the Nunavut Planning Commission that are consistent with the land use plan are forwarded to the Nunavut Impact Review Board for review. Business licences covered by this MCSR are required to undergo an environmental assessment through the Nunavut Impact Review Board process as well.

1.6. Projects subject to the model class screening

1.6.1. Projects subject to the *Canadian Environmental Assessment 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 of Canada Businesses Regulations* 1998. Section 13.1 of the *Inclusion List Regulations* under *CEAA* defines recreational activities that take place outdoors in a national park, outside of a town or visitor centre, as projects under *CEAA*. Because a permit is required pursuant to section 4.1 of the *National Parks Businesses Regulations* 1998 (included in section 24.1 (Schedule I, Part II) of the *Law List Regulations* under *CEAA*), the issuance of this authorization triggers *CEAA* and an environmental assessment is required. Subsection 5(1) of the *National Parks Businesses Regulations 1998* requires that a 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.

1.6.2. Projects excluded from the *Canadian Environmental Assessment Act*

The *Exclusion List Regulations* under *CEAA* make no provision for excluding any type of commercial guiding activity from assessment. Proposed commercial guiding activities that have been previously assessed either under *CEAA* 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 guided activities in the following subclasses in areas of Aulavik, Auyuittuq, Ivvavik, Kluane, Quttinirpaaq, Sirmilik, Tuktut Nogait and Ukkusiksalik (Figure 2). Specific activity subclasses include:

- hiking (trails, routes, large tour groups and smaller backcountry groups)
- mountaineering (with and without snow and icefields)
- winter use (skiing on and off established trails, ski mountaineering)
- overnight use (camping, bivouacs, fire, food handling, waste disposal)
- motorized boating
- non-motorized boating (rafting, kayaking)
- horse outfitting
- dog-sledding
- fishing
- over snow vehicles

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 commercial guiding services known to be currently operating in the northern 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. Some commercial guiding activities conducted in the parks do not meet the requirements of being routine, repetitive activities with known, environmental effects that can be easily mitigated. Activities that fall outside these categories are not included within the scope of the MCSR. Specific projects that are not included within the scope of the MCSR include:

- Activities that require a lease or licence of occupation;
- One-time, occasional or annual special events such as military exercises, sporting events, or festivals;
- Activities that require permanent or semi-permanent backcountry camp for the season; and
- Cruise ships and other large scale operations.

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 assessment.

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).

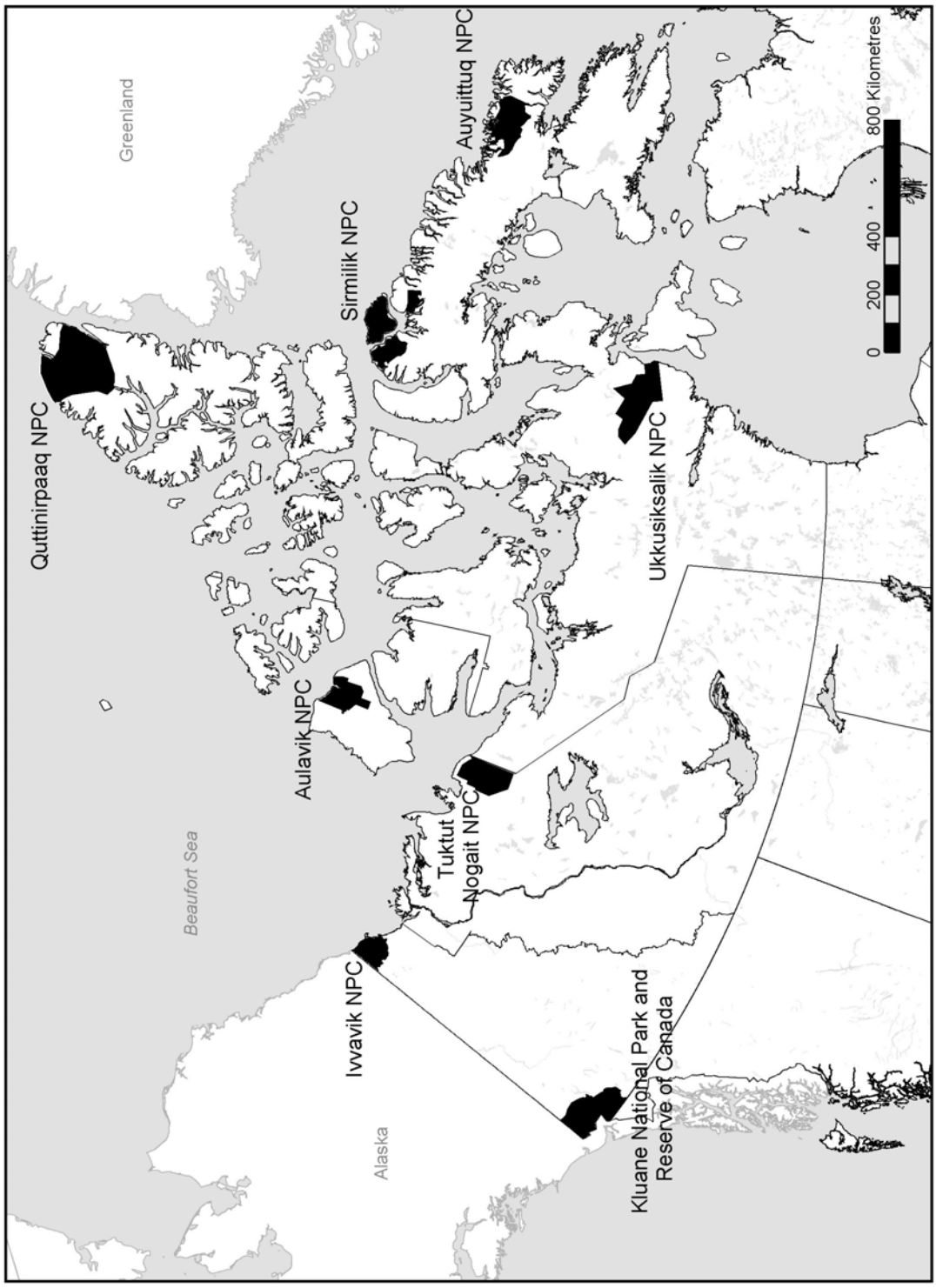


Figure 2: Location map (NPC = National Park of Canada)

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 or are identified on Schedule 2 or 3 of *SARA* (these species have been classified as at risk by COSEWIC, but prohibitions under *SARA* do not apply to them).

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 commemorative 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 *CEAA*. 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:

- Appropriate use of park lands and facilities (e.g. Winter use of specific areas)
- Management and maintenance of park facilities
- Management of overall visitor use levels
- Commercial business licence allocations or restrictions
- 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 that are considered to be primarily aesthetic are addressed under the visitor experience VEC.

1.7.2.1. Vegetation and soils

Native vegetation species, community and genetic diversity could be affected by these activities. Guides and clients could contribute to the introduction and spread of non-native plant species that may in turn affect the functioning of natural ecosystems and integrity of native plant communities. Soil structure could be impacted through compaction or erosion. There are no vegetation species at risk in the areas affected by this class screening.

1.7.2.2. Wildlife

Impacts (disturbance, displacement, and habituation) to all wildlife species will be considered, although special consideration will be given to species highlighted in management plans and species at risk.

1.7.2.3. Aquatic resources

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. Native fish species could be negatively affected by fishing. Guides and clients could contribute to the introduction and spread of exotic aquatic plant and animal species that may in turn affect the functioning of natural ecosystems and integrity of native plant communities. The spread of fish diseases is also a concern. Impacts to species at risk and other aquatic species must also be considered.

1.7.2.4. Cultural resources

Parks Canada Guiding Principles and Operational Policies (Canadian Heritage Parks Canada 1994) 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 *CEAA* and of Parks Canada's policies, direct impacts to cultural resources will be assessed in addition to indirect impacts caused as a result of changes in the environment.

1.7.2.5. Aboriginal land use

Traditional activities are protected by land claims and valued as part of ecological integrity of these national parks. As a result, direct and indirect effects of activities on Aboriginal land use will be considered. Visitors could interfere with the direct use of resources or indirectly affect Aboriginal use by, for example, negatively affecting wildlife populations, thereby decreasing hunting opportunities.

1.7.2.6. 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 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 northern 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: hiking, mountaineering, winter use, overnight use, motorized boating, non-motorized boating, horse outfitting, dog-sledding, fishing and over-snow vehicles. Mitigation measures associated with each activity were researched, reviewed and selected for their application to a northern park setting. The inclusion of mitigation as a condition of a business licence is intended to ensure that operators in the field implement appropriate environmental practices in a consistent fashion. Since more of the activities occur in Kluane than in any other park, Kluane may be referenced more often for explanation or special mitigation. 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 mitigation. The low visitation to many of the parks means few areas have become sensitive due to over use and/or the sensitivity has not become evident. Therefore fewer ecological sites were chosen for site-specific analysis in the parks with fewer visitors compared with Kluane, a higher use park. 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.

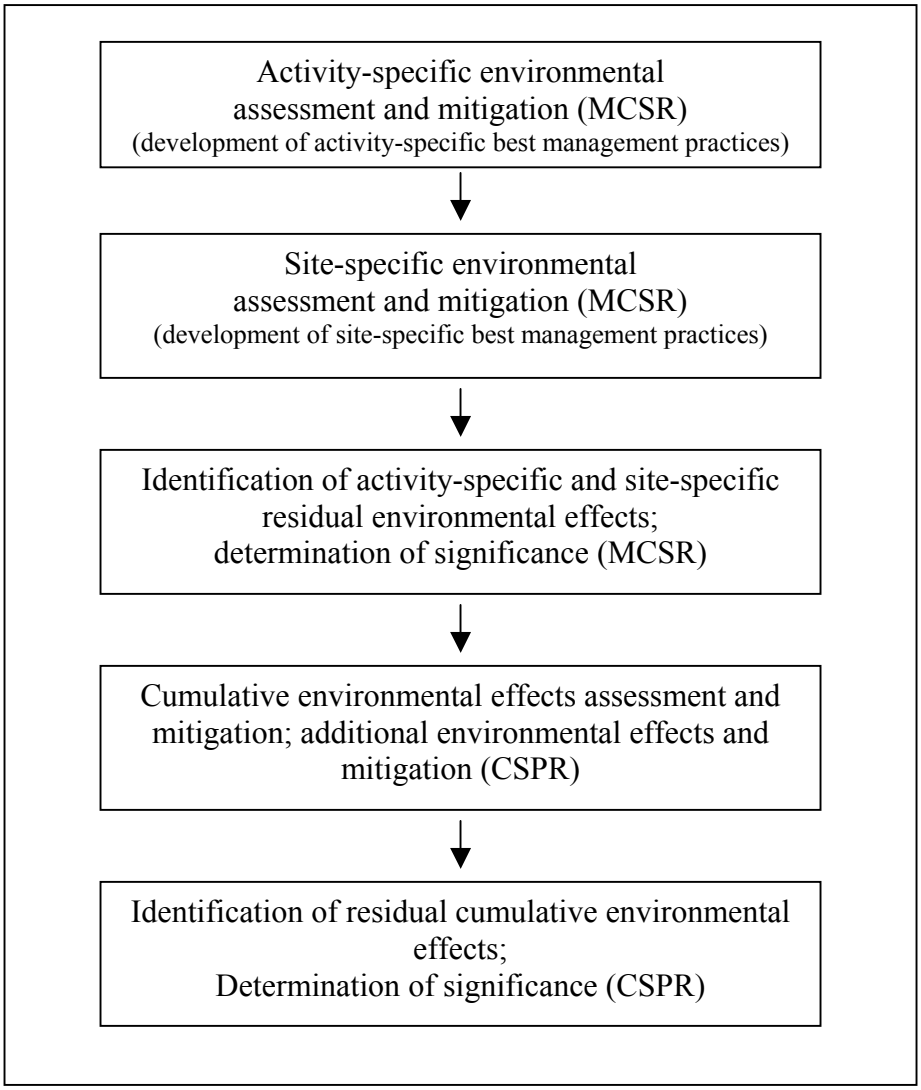


Figure 3: Environmental assessment process

Third, the ***cumulative effects*** assessment (CEA) describes and evaluates the impacts of 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. The CSPR 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 *CEAA*. 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 Aboriginal land use will be evaluated in terms of potential effects to harvest success rates and traditional use experience. 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.

	Level of Effect		
Criterion	**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 within the northern national parks that commercial guiding activities take place in. The section is broken down into two main subsections: a discussion of land use and management within the northern national parks (2.1) and; a description of the natural and cultural resources of the northern national parks broken down by VEC and by park (2.2). 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 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 northern national parks is divided into discussions on Aboriginal land use, the national park zoning system (2.2.1), and visitor use of the parks.

2.1.1. Aboriginal land use

Under the land claim agreements with authority in these parks, Aboriginal people are given access to the parks for traditional activities (see individual agreements for details). Traditional activities can include travel, camping, gathering, hunting and trapping. In some cases these activities take place near areas used by visitors. Informal communication between Aboriginal groups and park staff is used to try to minimize the number of conflicts between visitors and traditional users. References to "visitors" within this environmental assessment do not refer to Aboriginal people.

2.1.2. 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. Four zoning types are applicable in the northern parks.

2.1.2.1. 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.

2.1.2.2. 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, with the possible exception of strictly controlled air access in remote northern parks. Most of the northern parks are zoned as Zone II.

2.1.2.3. 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.

2.1.2.4. 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 campgrounds, visitor centers and day use areas. Of the northern national parks, Zone IV only occurs in Kluane.

2.1.2.5. 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.

2.1.3. Visitor use

Kluane, the most visited northern park, has been known as a premier wilderness destination for the past twenty years, offering hiking and mountaineering opportunities in spectacular locations (Table 2). Water-based activities have included rafting, kayaking and boating. These activities will be further encouraged in the future. Winter activities include cross-country skiing, backcountry ski touring and dogsledding. Recently there has been a greater emphasis on cultural tourism and the park expects this aspect to further

develop over time. Visitors come to the park for a portion of a day or for multi-day trips. The frontcountry areas can be accessed by the Alaska and Haines Road highways on the south and southeastern edge of the park. Visitors enter some backcountry areas by air (Parks Canada 2002b). Access to the designated green belt landing sites in Kluane is limited to one-way access and flights being scheduled every second day in order to preserve the wilderness character of the park.

Auyuittuq visitation is the second highest in the north, with most visitors hiking the Akshayuk Pass (Table 2). In Ivvavik most visitor use is rafting, kayaking and hiking in the Firth River corridor. The other northern parks are beginning to develop hiking and some canoeing visitation. In Nunavut tourism is expected to continue to grow and eventually become the second most important economic sector in the territory. Consequently, an increase in the number of visitors to the national parks in Nunavut is also likely (Vail and Clinton 2002).

Table 2. Total number of visitors to parks

Park	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Ukkusiksalik[c]	-	-	-	-	-
Tuktut Nogait	0	2	21	14	1
Aulavik	55	30	72	88	88
Ivvavik	210	128	155	165	150
Sirmilik[b]	-	-	-		328
Quttinirpaaq	508	192	192	192	435
Auyuittuq	1191	467	364	413	508
Kluane[a] Backcountry	1641	1653	1345	1341	1230
Kluane[a] Visitor Centre	59763	55287	52607	50993	45707

[a] Kluane total for 2001-2002 includes estimated numbers for three months of the year (Parks Canada 2002f)

[b] Sirmilik was designated a national park in 2000.

[c] Ukkusiksalik was designated a national park in 2003.

Commercial guided activities only represent a portion of the visitors to the parks. Table 3 shows that from a 17%-45% of people in these parks are guided. Commercially guided groups can be larger in size and account for a higher proportion of people being taken into the backcountry. The Alsek Valley in Kluane is an example of this where over the last five years, commercial use accounted for an average of 35% of the parties but 60% of the total people and person days spent in the valley. Other parks do not have information about the proportion of use that is guided commercially, but because of the remote location of the parks, many groups chose to use commercial operators.

Table 3. Percentage of groups[a] and visitors that are commercially guided each year.[b]

Park	Activities	% of groups that are commercially guided	% of visitors that are commercially guided
Kluane	hiking, rafting, horseback, skiing, canoeing	11	30
Kluane	mountaineering	8	Not Available
Aulavik	canoeing	29	45
Ivvavik	rafting and 2 hiking groups	27	44
Tuktut Nogait	hiking	5	17

[a] Groups of visitors who travel and participate in the activity together, usually as a result of prior arrangements.

[b] Percentages of visitors is higher because commercially guided groups have larger group sizes. Data from other parks was not available.

2.2. Description of natural and cultural resources

2.2.1. Vegetation and soil

Vegetation in the northern national parks of this class environmental assessment varies from boreal to arctic. The parks will be described individually based on the description of the ecoregion they fall within. The descriptions of ecoregions are taken from *A National Ecological Framework for Canada* (Ecological Stratification Working Group 1996).

2.2.1.1. Aulavik

Aulavik is found in the Banks Island Lowland Ecoregion. Moss with low growing herbs and shrubs such as purple saxifrage, *Dryas spp.*, arctic willow, kobresia, sedge and arctic poppy is the main vegetation cover. Turbic Cryosols soils cover hills of glacial deposits. The permafrost is deep and continuous with high ice content. Wetlands include fens, elevated peat mound bogs and marshes along the coast.

2.2.1.2. Auyuittuq

Auyuittuq is mainly found in the Baffin Mountains Ecoregion. Vegetation is sparse with discontinuous mosses, lichens, sedge and cotton grass. Bare bedrock is common. The permafrost is deep and continuous with low ice content. Turbic Cryosols are found on colluvial, alluvial and morainal deposits.

2.2.1.3. Ivvavik

Ivvavik is mainly found in the British-Richardson Mountain Ecoregion, but also has parts in the Old Crow Basin Ecoregion and the Yukon Coastal Plain Ecoregion. The alpine areas of the British Richardson Mountains have tundra composed of lichens, mountain avens and others. The subalpine areas have woodland vegetation with stunted white

spruce, willow and other shrubs. The Yukon Coastal Plain is covered by shrubby tundra vegetation (dwarf birch, willow, Labrador tea etc.). The Mackenzie Delta has ground cover consisting of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen and moss. Localized impacts on vegetation may be found in the Firth corridor due to trampling by people.

Most of Ivvavik was not covered with glaciers during the last glaciation. As a result the mountains have been shaped by river and stream erosion and soils have been weathered for millions of years. Continuous permafrost covers the area from 50 cm to many hundreds of metres in depth.

2.2.1.4. Kluane

Kluane is mainly found in the St. Elias Mountains Ecoregion, but also has parts in the Mount Logan, Yukon-Strikine Highlands, and Ruby Ranges ecoregions. Kluane is dominated by two major mountain ranges: St. Elias Mountains and the Kluane Ranges. These spectacular mountains include the highest mountain in Canada and one of the youngest mountain ranges in North America. The northern and eastern parts of the park are in the lee of these mountains making the climate more arid. Glaciers and icefields influence ecological processes in the whole area. Continuous permafrost underlies the northern portion of the park, with the majority of the park having discontinuous permafrost (Environment Canada 1987b). Approximately 18% of the park is vegetated. The vegetation can be divided into three major zones: the montane zone, the subalpine zone and the alpine zone. The montane zone covers 7% of the park including the valleys and land up to 1080 or 1100 m in elevation. The vegetation is predominantly white spruce with some marshes, fens, shrubs and herb communities. The subalpine zone is between 1080 and 1370-1400 m in elevation. Tall shrubs, mainly willow, are most common with occasional white spruce. In the alpine zone above 1400 m in elevation, low krummholz shrub communities, dwarf vascular plants and alpine tundra are found (Environment Canada 1987a).

2.2.1.5. Quttinirpaaq

Quttinirpaaq is found in the Eureka Hills, Ellesmere Mountains and Ellesmere Ice Caps ecoregions. Vegetation is sparse. Moss, lichen and cold-hardy vascular plants such as sedge and cottongrass are found in clumps. Occasionally arctic willow, *Dryas spp*., kobresia, sedge and arctic poppy are found. Regosolic static, regosolic turbic cryosols, and orthic turbic crosols are found on colluvial, alluvial and marine deposits. Ice fields and nunataks are common.

2.2.1.6. Sirmilik

Sirmilik is primarily found in the Borden Peninsula Plateau and Baffin Mountain ecoregions. Sparse vegetation includes moss, low-growing herbs and shrubs. Common species include purple saxifrage, *Dryas spp.,* arctic willow, kobresia, sedge and arctic poppy. Other areas have a discontinuous cover of mosses and lichens with some sedges and cottongrass. Deep continuous permafrost covers the area with medium ice content.

The soils are regosolic turbic cryosols with regosolic static cryosols on glacial deposits. Bedrock is also common.

2.2.1.7. Tuktut Nogait

Tuktut Nogait is found in the Coronation Hills and Bluenose Lake Plain ecoregions. Dwarf birch, willow, northern Labrador tea, *Dryas spp*., and *Vaccinium spp.* form an almost continuous vegetation cover. Warmer sites can have tall dwarf birch, willow and alder and wetter sites have willow and sedges. Continuous permafrost with medium ice content underlies the area. Organic Cryosols and Turbic Cryosols cover undulating glacial tills, fluvioglacial and marine deposits.

2.2.1.8. Ukkusiksalik

Ukkusiksalik is located in the Wager Bay Plateau Ecoregion. The vegetation is a discontinuous cover of dwarf birch, willow, northern Labrador tea, *Dryas spp.* and *Vaccinium spp.* Warmer sites have taller shrubs and wet sites mainly are covered by willow and sedges. Permafrost is continuous with low ice content. The soils are turbic and static cryosols on thin, sandy moraine and alluvial deposits. Regosolic static cryosols are found along the coast.

2.2.2. Wildlife

Wildlife in the national parks in this class environmental assessment can be harvested by Aboriginal people for subsistence use. The regulation of this activity and the management of wildlife populations is the responsibility of cooperative management boards established under land claim agreements (except in Kluane). In the Western Arctic, the Wildlife Management Advisory Council and Fisheries Joint Management Committee have these responsibilities for Ivvavik, Aulavik and Tuktut Nogait. In the Eastern Arctic the Nunavut Wildlife Management Board has these responsibilities. In all cases the boards work cooperatively with hunters and trappers committees/associations, the territorial government, other federal departments and Parks Canada. In Kluane, Parks Canada has jurisdiction over the wildlife in the park, but works cooperatively with the cooperative management board and surrounding land management agencies to establish no harvest zones and manage wildlife populations.

The birds and mammals will be described for each park. Marine mammals will be described in Section 2.2.3.1.

2.2.2.1. Aulavik

Aulavik is home to a large population of muskox that has grown exponentially in the latter part of the 20th century. Populations of muskox on Banks Island approach one animal per square kilometre with Aulavik representing the major portion of habitat use. Peary caribou during this same period have shown a sharp decline in population to about 1196 individuals. The Banks Island population of Peary caribou has been listed as endangered on Schedule 2 of *SARA*. Visitors to the Thomsen River corridor commonly see arctic wolves. Other common mammal species include lemmings, arctic fox, and arctic hares. The only mammal species of special concern in Aulavik is the polar bear on Schedule 3 of *SARA*.

As with mammals, bird species in Aulavik may be limited in diversity but high in density. There are a total of 43 known species recorded for Aulavik of which only the raven and the ptarmigan are year-round residents. The most significant bird population is lesser snow geese. The largest concentration of lesser snow geese in the Western Arctic breed and moult in the area. The Thomsen River and Castel Bay area was created as a bird sanctuary for protection in 1961 (Grayhound Information Services 1997). Other common species include: loons, gulls, brant geese, sandhill cranes, ptarmigan, and Lapland longspur. The only bird species of special concern in Aulavik is the peregrine falcon (*Falco peregrinus tundrius*), Schedule 3 of *SARA*.

2.2.2.2. Auyuittuq

Small mammals such as lemmings, arctic foxes, arctic hare and ermine live in Auyuittuq. Barren-ground caribou, polar bears (listed as species of special concern on Schedule 3 of *SARA*) and arctic wolves can also be found in the park. The limited amount of suitable breeding habitat and low biological productivity restrict the number of birds found in Auyuittuq (40 species of birds are found in Auyuittuq) (Canadian Parks Service 1989). The Ivory gull is listed as "special concern" on Schedule 1 of *SARA*, migrates through Auyuittuq.

2.2.2.3. Ivvavik

Four key wildlife species in Ivvavik, Yukon, are given special management: peregrine falcons, grizzly bears, Porcupine caribou, and muskox. The grizzly bear is considered "a species of special concern" on Schedule 3 of *SARA* and is of particular concern because of the potential dangers to visitors. The Porcupine caribou herd contains approximately 123 000 animals using the park on the coast for calving and post-calving. Muskox were extirpated from the Yukon and Alaska North Slope between 1858 and 1865, but reintroduced in 1935, 1936 and 1969. The muskox is considered a specially protected wildlife species under the *Yukon Wildlife Act*. Today approximately 700 live in the Yukon and Alaska North Slope. Approximately 143 bird species, moose, Dall's sheep, and numerous other species of wildlife also live in the area (Weerstra 1997). Short-eared owls, wolverines, peregrine falcons (*Falco peregrinus tundrius*), grizzlies and polar bears are species of special concern according to Schedule 3 of *SARA*.

2.2.2.4. Kluane

A wide variety of wildlife species live in Kluane, Yukon, including: grizzly bears, Dall's sheep, mountain goats, wolves, lynx, wolverines, coyotes, and a small population of woodland caribou. Grizzly bears, wolverines and woodland caribou are considered species of special concern (grizzly bears and wolverines are on Schedule 3 of *SARA*, woodland caribou will be added to Schedule 1 following public consultation). The current status and vulnerabilities of grizzly bears, Dall's sheep, mountain goats, and moose are documented in a recent cumulative effects analysis with the populations considered stable, although in some cases vulnerable to specific disturbances in certain areas (Slocombe et al. 2002). Mule deer, cougars, gyrfalcons, and peregrine falcons are specially protected by the *Yukon Wildlife Act*. Over 180 species of birds are present in

the park, including threatened peregrine falcons (*Falco peregrinus anatum*), (listed on Schedule 1 of *SARA*) and short-eared owls (listed as a species of special concern on Schedule 3 of *SARA*).

2.2.2.5. Quttinirpaaq

Smaller mammals such as lemmings, arctic fox, arctic hare and ermine are found in the park. Endangered Peary caribou (listed on Schedule 2 of *SARA*), muskoxen, and occasionally polar bears (listed as special concern on Schedule 3 of *SARA*) or arctic wolves are found in the park. Quttinirpaaq is north of the typical range for many bird species and has less regularly open sea water than other arctic areas. As a result, only 22 species are regularly observed there. Only the rock ptarmigan and occasionally the black guillemot winter in the park (Parks Canada 1994). The ivory gull, considered of "special concern" on Schedule 1 of *SARA*, is seen in Quttinirpaaq, but has not been seen nesting in the park.

2.2.2.6. Sirmilik

Smaller mammals such as lemmings, arctic fox, arctic hare, and ermine live in Sirmilik. Polar bears (listed as special concern on Schedule 3 of *SARA*) are found in the park, and arctic wolves, red fox and wolverines (listed as special concern on Schedule 3 of *SARA*) may be occasionally found in the park. Large colonies of waterfowl/sea birds are a distinctive feature of this area. More than 70 species of birds can be found in Sirmilik. A large population of greater snow geese nest in Sirmilik. The geese that nest in this area are estimated to be more than 35% of the total breeding population. The largest colony of black-legged kitiwakes is located near Cape Hay, with a second one near by. Similarly Cape Hay has one of the four largest colonies of thick-billed murres in Canada (Zoltai et al. 1983). The most diverse avian community north of 70^{o}N lat. lives in the park and area. Bylot Island, within the park, is a designated bird sanctuary. The ivory gull, considered "special concern" and protected by *SARA*, migrates through Sirmilik.

2.2.2.7. Tuktut Nogait

Tuktut Nogait was created to protect the calving grounds of the Bluenose herd of barren ground caribou. A recent population estimate of the herd is 75 000 adults. Wolverine, grizzly bear, fox, lemming, and voles are also common to the park.
There are 74 known bird species for Tuktut Nogait with a wide variety of waterfowl, shorebirds, raptors, and songbirds. The Park is known for concentrations of raptor nesting habitat along the canyon and cliff walls. Species of special concern on Schedule 3 of *SARA* in Tuktut Nogait include the grizzly bear, wolverine, short-eared owl and peregrine falcon (*Falco peregrinus tundrius*).

2.2.2.8. Ukkusiksalik

Numerous smaller mammals live in the park from arctic hare and lemmings to furbearers such as red fox. Barren ground caribou, polar bears (listed as special concern on Schedule 3 of *SARA*), wolverines (listed as special concern on Schedule 3 of *SARA*) and arctic wolves are also found in the park. Raptors such as peregrine falcons (listed as special concern on Schedule 3 of *SARA*), gyrfalcons and rough legged hawks live in the

areas with a wide range of tundra birds totalling 69 species. Common eider and Black guillemot colonies and numerous other sea birds are found in Wager Bay (Zoltai et al. 1987).

2.2.3. Aquatic resources

2.2.3.1. Marine

The boundaries of Aulavik, Auyuittuq, Ivvavik, Sirmilik, Quttinirpaaq and Ukkusiksalik contain salt-water bays and other marine components. Marine mammals, anadromous fish and marine fish live in these waters. Both the western arctic population of the bowhead whale found in Ivvavik and high arctic population found in Sirmilik, Auyuittuq and Ukkusiksalik are listed as endangered on Schedule 2 of SARA; the eastern high arctic beluga whale population found in Sirmilik is listed as special concern on Schedule 3 of SARA. The northeast pacific transient killer whale population found in Ivvavik are threatened and listed on Schedule 1 of SARA. Several species of seals are found in Aulavik, Auyuittuq, Quttinirpaaq, Sirmilik, and Ukkusiksalik. Walruses are found in Sirmilik and may be found in Auyuittuq.

2.2.3.2. Fresh

Fresh water resources are limited in many of the parks due to low precipitation and permafrost that prevent groundwater storage. Ponding and imperfect drainage are common in areas such as the Arctic Coastal Plain of Ivvavik, Aulavik, Tuktut Nogait and the Hazen Plateau in Quttinirpaaq. Rivers and streams are often fed by glacier melt or snowmelt and therefore have the largest volume in the spring and can vary dramatically in volume. Growth rates and sexual maturity of northern fish populations are often retarded due to short growing season and low nutrient levels. However, seasonal abundance of insects and low metabolic requirements can create an older population of large fish. There is limited diversity of species although there can be large concentrations of resources in specific habitats. Important habitat types include estuaries, aufeis areas, fish holes, and deep lakes. Areas of fish congregation are often also areas of local concern for traditional use and continued success of migratory populations. The fourhorn sculpin found in Aulavik are considered a species of special concern. Kluane also has important populations of landlocked Kokanee salmon (Parks Canada 2002b). Ivvavik has landlocked populations of Dolly Varden in areas which escaped the last period of glaciation and may prove genetically important. The following description focuses on the aquatic resources used or mostly likely to be used for recreation. Sirmilik and Auyuittuq do not have fresh water bodies that are likely to be used for guided aquatic recreational activities and are therefore not further described below.

Aulavik

Thomsen River and Muskox River

The Thomsen River is the northernmost navigable river in Canada. Entering the park near its headwaters at the south end of the park, it flows through the centre of the park and empties into Castel Bay on the Arctic Ocean. Muskox River is the major tributary, draining a wetland area. The watershed provides habitat for at least six species of fish, possibly the most northern example of multi-species freshwater fish ecosystem (Parks

Canada 2002a). All species, except lake trout, are anadromous. The freshwater form of the fourhorn sculpin is sensitive to human disturbance (Grayhound Information Services 1997). The valley around the Thomsen River is broad, gently undulating and relatively lush (Parks Canada 2002a). The Thomsen River area is identified in the Sachs Harbour Community Conservation Plan under site numbers: 602D (Thomsen River Area), 601C (Offshore and Onshore Banks Island, 612C (Banks Island Migratory Bird Sanctuary No. 2), 613E Aulavik National Park, and 614D (Banks Island Rivers). Community concerns related to this assessment include protection of cultural artifacts and sites, protection of char, trout and cisco, protection of wetlands and goose moulting areas.

Ivvavik

Firth River

The Firth River has its headwaters in the Davidson Mountains in Alaska. It then flows through the British Mountains in narrow valleys and canyons until it reaches the flat Arctic Coastal Plain near the mouth (Canadian Parks Service 1993). The Firth River is a proposed Zone 1 area for preservation of cultural resources and is identified as Site 721D in the Aklavik Community Conservation Plan. Community concerns are for anadromous and non-anadromous Dolly Varden charr.

Kluane

Alsek/Dezadeash Rivers

The Alsek River, 90 km of which is designated a Canadian Heritage River, starts at the confluence of the Dezadeash and Kaskawulsh Rivers in Kluane and flows 250 km to the Pacific Ocean. Large glaciated valleys dominate the landscape as the Alsek flows through the St. Elias Mountains (Environment Canada 1987a). A sensitive area, many locations along the river are considered Zone 1 to protect the grizzly bear habitat and other sensitive species in the area.

Kathleen Lake/Louise Lake

Kathleen Lake is the largest lake in Kluane covering an areas of 3 375.8 ha and having a maximum depth of 111.0 m. Formed by glacial scour where bedrock or unconsolidated material was weak, this lake provides habitat for seven fish species (broad whitefish, pygmy whitefish, arctic grayling, kokanee salmon, rainbow trout, Dolly Varden, lake trout, slimy sculpin) (Environment Canada 1987a). In 2002 and 2003 the number of kokanee found in annual surveys declined dramatically. Currently the cause of the decline is unknown, but the need for management action to protect the kokanee will be evaluated before the summer of 2004. A day use area is located on the shore of the lake with a boat ramp and picnic area. Several trails and a campground are also located near the shore.

Mush and Bates Lakes

Mush and Bates Lakes are 1,830.5 ha and 1,815.2 ha in size respectively with maximum depths of 39.2 m and 30.1 m. These lakes were also formed by glacial scour of weak bedrock or unconsolidated material. Bates Lake is very clear and has strong thermal stratification (Environment Canada 1987a). The lakes have broad whitefish, pygmy

whitefish, arctic grayling, Dolly Varden, lake trout, and slimy sculpins. Mush Lake is accessible to four-wheel drive vehicles and motorized boats are permitted on the lake.

Quttinirpaaq
Lake Hazen
Lake Hazen is the largest lake north of the arctic circle, 537.5 km^2, with a maximum depth of 273 m. The ice covering the lake to depths of up to 236 cm does not all melt in the summer (not more than 50-60% clear). With a maximum temperature of 3^oC, the water is very clear and unproductive. Arctic char is the only fish species found in the lake (Parks Canada 1994).

Tuktut Nogait
Hornaday River
The Hornaday River is the largest river in Tuktut Nogait with a drainage basin of approximately 14 900 km^2 and the river is 325 km long. Eleven species of fish have been found in the Hornaday. There is ongoing research into the anadromous char resources of the river (Downie 1995). This population sustains an important local fishery for the community of Paulatuk.

Ukkusiksalik
Ford Lake and Brown Lake are the two largest lakes in the park and are connected together and to Wager Bay. Ford Lake is in an area with large relief, while Brown Lake occupies a fault basin. Fish species are relatively diverse because Ukkusiksalik is located on the mainland and further south than most of the other parks. There are also marine, estuarine and freshwater habitats (Zoltai et al. 1987). Little information has been collected on specific species in the park.

2.3. Cultural resources

The cultural resource sites described below were selected because of their sensitivity and vulnerability. Numerous other sites could be disturbed, but there are too many to list and the generic mitigations described will adequately protect them. The following cultural resource information was taken from Parks Canada archaeological databases in Winnipeg. No sensitive cultural sites were identified in Sirmilik and Ukkusiksalik.

2.3.1. Aulavik

Head Hill Site 130X88
The site consists of a series of muskox kill sites and dwelling remains on the crest of a hill on the north side of the Muskox River, west of its confluence with the Thomsen River. The remains of an estimated 800-1000 muskoxen, including 561 skulls are at the site, which stretches about 350 m on a north-south axis along the hillcrest. The site may have been occupied from A.D. 1600-1771 during the “Intermediate Interval” which is a transitional period between Thule and Copper Inuit and by the Copper Inuit from A.D. 1851-1890.

Nasogaluak Site 130X4
The site is located on the western and southern edges of a high terrace or bluff overlooking the Thomsen River and valley. The valley is broad with little topographic variation and the river meanders across a wide and often sandy floodplain. The site features, consisting primarily of caches (about 40), are discontinuously spread over a large area measuring 20 000 sq. m. Copper Inuit were the likely inhabitants of the site, within a time period between A.D. 1851-1890.

HMS Investigator Cache Site (M'Clure's Cache Site) 130X107
The site is located on Providence Point Peninsula, about 2 km south of Providence Point, along the western shore of Mercy Bay. The site consists of three clusters of debris, abandoned by Robert M'Clure and his crew of the Investigator (1851-1853). This site is a focal point of Inuvialuit travel and collection routes for Banks Island.

Burials
Isachsen Sands 130X59
This site is about 20 km south of the Head Hill Site, on the northwest bank of the Thomsen River. Three tool caches believed to be burial caches are located away from the tent rings and meat caches of the main habitation area of the site.

130X14 (Possible Burial)
The site is located on the west side of the Thomsen River on a stony, well-drained terrace about 4 m above the river and 10 m west of the water's edge. A boat-shaped arrangement of stones is considered to be a possible grave.

130X34 (Possible Burial)
The site is on the west side of the Thomsen River on a low ridge in an area dominated by large, thin stone slabs. This extensive site consists of about 80 slab caches, a few dismantled tent rings and a possible grave formed of slabs.

130X38 (Probable Burial)
The site is spread along the east edge of a gravely terrace about 20 m above and 25 m south of a seasonal creek that flows north to the Thomsen River. Two probable graves were recorded consisting of small and large cobbles in approximately parallel lines.

130X111 (Possible Burial)
The site is on the crest of a low hill paralleling a small seasonal stream to the north, draining into a creek on the west side of the site. A possible grave measures 1.5 m by 2.5 m, is roughly oval in shape and consists of small cobbles. No artifacts or bones are associated with the feature.

130X126 (Possible Burial)
A possible grave 3.2 m by 1.2 m in size, covered by heavy vegetation is recorded 750 m west of the Thomsen River. No associated artifacts or bones are present.

130X153 (Possible Burial)
A tent ring, cache and possible grave are located approximately 350 m west of the Thomsen River. The grave is rectangular, measures 2.8 m by 1.3 m and is covered by considerable vegetation.

130X171 (Probable Burial)
The site is located on the east side of the Thomsen River on a terrace/spur 30 m above the river, offering a commanding view of the river valley. The feature is ovoid in shape measuring 3.0 m by 2.3 m with numerous small, flat stones covering a 1.6 m by 1.0 m area composing the probable grave. Approximately 18 possible human bones and several artifacts are associated with the feature.

130X209 (Possible Burial)
The site is located on the west side of the Thomsen River, north of an unnamed stream and about 7.2 km northwest of Dissection Creek. The possible grave consists of 17 small rocks and measures 1.8 m by 1.1 m and appears to be untouched. No associated artifacts or bone was observed.

130X213 (Possible Burial)
The site is located about 400 m west of the Thomsen River, near site 130X29. The possible grave is rectangular shaped, its long axis oriented north-south. It is noted as being an appropriate size and shape for a grave.

130X218 (Possible Burial)
The site is on the west side of the Thomsen River, on the edge of a grassy hill near the head of the outside bend of a large meander in the river, across the river from "Trout Beach". The possible grave, measuring 2.7 m x 2.3 m, is made of large and small boulders. Three caches are also present at the site, but no artifacts or faunal material is associated with the features.

130X229 (Possible Burial)
A possible grave is situated on a small knoll on the north bank of the Muskox River, a short distance from the Thomsen River and about 20 km north of Isachsen Sands. The feature is formed of flat rocks and cobbles covering a 1.0 m by 2.5 m area. A number of artifacts and bone are associated.

2.3.2. Auyuittuq

Zone I: 205X6
This site is on a small bedrock peninsula on the north shore of Maktak Fiord near the mouth of Coronation Fiord, 1 m - 80 m from the sea. The site consists of 18 or more caches, four stone house structures, five tent rings, four kayak stands and a fox trap. A Middle to Late Thule (A.D. 1000-1600) cultural affiliation is suggested for the site. A monitoring system has been established to assess soils, vegetation, and any changes in the cultural features.

205X17
This site is about 7.5 km east of the head of Maktak Fiord on the north shore. A rivulet runs down the mountain east of the site. Two tent rings and a temporary shelter comprise the site. The shelter, measuring 2.85 m long x 1.8 m wide x 1.5 m high, uses a natural rock outcrop with the front and back walls constructed of three layers of rocks. The area is significant as local elders state that taraituk or ghosts/spirits are present.

Burials
205X93
The 1953 burial of Dr. Ben Battle, a scientist who was a member of one of the first scientific expeditions into the area is reported to be at the foot of Mount Battle, on the southeast side of Glacier Lake (Elliot 1972:76).

205X94
Five graves are located on the north side of North Pangnirtung Fiord near the mouth of the fiord, in the vicinity of emergency shelter #12. Five families living in the area moved out in the late 1950s and the graves likely relate to them. Two adult women are buried in wooden coffins 133 m apart. Three infant graves are in a nearby group.

2.3.3. Ivvavik

Zone 1 cultural areas identified in the management plan include four archaeological regions along the coast (Clarence Lagoon, Catton Point, Roland Bay, west end of Nunalak and Niaqulik) and the Firth River corridor between Sheep Creek and the coast.

Clarence Lagoon
30Y96 (Burial)
The single grave is exposed on the edge of an actively eroding bank, just west of the opening to Clarence Lagoon. In 1996, the wooden grave covering was observed to be overgrown with vegetation and sinking into the sod. There are some surface artifacts associated with the grave including fragments of a whalebone kayak keel, sled runner and possible harpoon shaft. The site probably relates to the Western Thule culture (A.D. 1000-1778) and should be monitored carefully for erosion problems and protected from unnecessary visitation.

72Y (Structures)
The site is about 40 m back (south) of the beach ridge and in front of a small pond at the northeast corner of Clarence Lagoon. It consists of two small rectangular sod-embanked cabin foundations measuring 3.1 m x 2.6 m and 1.7 m x 1.6 m. The larger cabin has some floor remains, which appear to have been burnt; no visible artifacts are associated with either feature. The site is likely associated with the Inuvialuit culture, dating as far back as A.D. 1778.

74Y Hudson's Bay Company Post
The site is on the east shore of Clarence Lagoon, toward the south end of the lagoon. The site consists of two extant structures, the remains of five other structures and numerous associated surface artifacts.

76Y (Structures and Burials)
The site is located about 3 km west of the Hudson Bay Company store, along the south shore of Clarence Lagoon to the immediate east of the most inland portion of the lagoon and west of a small spit and bay. The site concentrates around a small rise, which is about one metre above the surrounding tundra. The site consists of two large, well-defined pole and sod houses and six smaller foundations. There is also an ice house, a burial, and several other features including house annexes, tent sites and middens. The site is considered to have an Inuvialuit (possibly Western Thule) A.D.1778 - 1996 cultural affiliation. Numerous other artifacts remain in their original location along the high ridge where the site is centred. The grave consists of east-west oriented driftwood logs in a shallow rectangular depression measuring 1.4 m x 2.4 m. It is situated on the west side of the knoll. A possible grave is 3.5 m southwest and consists of a few east-west oriented logs in a slight depression 1.2 m wide.

Catton Point
30Y98 (Structure)
The site is on the west side of a small inlet just west of Catton Point. It is about 200 m inland from the coast and adjacent to the inlet's edge. The main site feature is an intact log house constructed from horizontally laid logs, notched at the corners, with a plank floor and a sod roof. The site is associated with the Historic Inuvialuit A.D. 1778-1987.

83Y (Structures and Burial)
The site is on the shore of a small bay at the southeast tip of Ptarmigan Bay, 400 m due east of Catton Point Spit. A small creek runs to the northwest of the site. Two standing houses, a log foundation, a grave, and associated artifacts characterize the site. One structure was not present in 1987, but there is graffiti dating to 1988, mostly documenting summer visitors. There are a large number of historic artifacts associated with this site. The other house was built in about 1944 and has been almost completely dismantled. A Christian burial marked by a cross, is located 187 m southwest of his house.

84Y (Structure)
This site is located at the southern tip of Ptarmigan Bay, 300 m inland from the shore of MacKenzie Bay, which is also the south end of the Catton Point spit. A log cabin stands near the eroding bank edge.

Qargialuk 85Y (Structures and Burials)
The site is on a large vegetated knoll midway down Catton Point Spit. The spit separates Ptarmigan Bay from MacKenzie Bay. Cultural features are clustered in three distinct areas on the knoll. The focal point of the south cluster of features is a single modern cabin, owned by Danny C. and Annie Gordon. Numerous drying racks, smoke houses and lean-tos are spread out to the south along the spit. Eight graves are present on the north side of Qargialuk, on the northwest side of the hill. All are a traditional, non-Christian style, with a covering of driftwood logs and could date as far back as the Historic Inuvialuit period A.D. 1778. Six have grave goods and bone exposed on the surface. Four driftwood piles, resembling graves, are to the west, near the edge of the bank.

93Y (Burials)
The site is on the coast of the Beaufort Sea, 4.5 km due east of the hook at the northern tip of Catton Point Spit. The site is 25 m from the edge of the bank on the northeast shore of a small bay west of Ptarmigan Bay. It consists of two large, very intact traditional burials and a smaller, less defined burial. The larger graves are roughly square and retain some evidence of formal structure. Grave goods consisting of carved wood and bone tools are on the surface, but scant human bone. The small burial is deeply buried with no visible artifacts or bone associated with it. A Historic Inuvialuit (A.D. 1778 - 1987) cultural affiliation is suggested for the site.

Roland Bay
88Y (Structure)
This site is located halfway down the east coast, south from the mouth, of Roland Bay. The primary standing structure is a standing log cabin about 2 km from the mouth of the bay on its east side. Adjoining to, and wrapping around, the exterior of the west end of the building is a dog house; an enclosed "walkway" with tin flashing around its interior base; and a porch. Other site features include an infilled, cribbed ice house, a wooden walkway running between the cabin and the beach, drying rack, wood pile, wood sled, wood radio tower and other associated artifacts.

West End of Nunaluk and Niaqulik
Nunaluk 69Y (Structure)
The site is located on a knoll near the east end of Nunaluk Spit, extending eastward on the sand beach to the east edge of the spit. The spit runs about 20 km along the Beaufort Sea coast, from the western margin of the broad Malcolm River mouth east to the Firth River. The primary feature is an extant house 4.4 m x 5.5 m. Other site features include a log foundation, tent frames and lean-tos.

Niaqulik 82Y (Structures and Burials)
The site is just west of Kay Point in Phillips Bay. This area, also called Niaqulik or Head Point, is the most easterly of the surviving coastal settlements in the park. Site features include log houses, sod house remains, tent frames, drying racks and ice house remains. The most intact structure at the site is a large, well-constructed post and plank house measuring 6.3 m x 5.6 m. Some features are also located at the top of the bluff on the coastal plain. The most visible of these is a log house probably built by Isaac Aluniq in the late 1930s. Two marked graves are approximately 70 m south of Isaac Aluniq's house. One measures 2.4 m x 1.3 m with two of four intact sides of a picket fence with carved corner posts. Several other graves are situated about 68 m northeast of these graves. One measures 2.7 m x 1.8 m and is surrounded by a picket fence. Immediately south of this grave is a mound with at least five graves, marked with headboards from which the inscriptions have been worn.

Firth River Corridor
30Y70 (Burial)
The site is on the northwest side of the Firth River about 150 m south of Loney Creek and 180 m from the river, on a beach ridge about 15 m above the river. The site is on the

south of two little knolls on the northeast corner of second bench above the junction the Firth and Loney creek. A Precontact human burial disturbed by rodent activity was found eroding out of the terrace.

Engigstciak Rock Shelter (30Y74)
The site is 700 m east of the Firth River at the base of the south face of the prominent rock outcrop known as Engigstciak. The rock shelter consists of two walls of stone piled two blocks high. The shelter was likely used by hunters awaiting game and appears to be the focal point for considerable activity that occurred on the ledge. An unspecified number of human bones were observed in and around the shelter.

30Y114 (Mining Camp)
The site is located on the west side of the Firth River between two tributaries in the middle of a large stand of trees, 1.0 km from the river. It consists of a log cabin with a collapsed roof, privy and tree cache. Diverse artifacts lay around both the cabin and the cache, some indicating dates back to the 1940s; but most artifacts are quite recent.

Flume Site 30Y115 (Mining Camp)
The site is on the east side of the Firth River about 0.5 km south of Cookie Creek. It incorporates the river's edge and the first two terraces. It also covers the entire hilltop and upper slopes. The site is important as one of the best examples of gold placer mining operations in the park. It contains a very extensive mining camp or series of camps dating back to 1947 with features and artifacts including a flume, three caches, sluice boxes, stove, toboggan and a variety of mining equipment.

A Western Thule occupation radiocarbon dated to 650-490 B.P. (before present) is characterized by a buried component eroding out of the bank at the south end of the site. The remains include a house feature, stone tools and massive quantities of butchered caribou bone.

30Y116 at rafting campsite
The site is located at the junction of the Firth River and Sheep Creek, on the north bank of Sheep Creek. Currently the area is forested in places to the west of the camp and most of the slope on the north side of the creek has no vegetation and is talus. Cultural components are exposed at the current camp and along the blade cut trail running west from the camp. This multiple-featured site is the summer home and mining base of the Parkes family who operated a placer mine on Sheep Creek from the early 1970s to 1986. Features include a cook shack, machine shop, bunkhouse trailer, and woodshed. A small collection of historic artifacts is on display at the camp.

30Y128 at rafting campsite
The site is on the west bank of the Firth River on the edge of a third terrace level above the canyon. It is midway between the first and second unnamed creeks that are on the east side south of Sheep Creek. The site is exposed in a wet tundra area at the south end of a large level area of spruce trees. An active blowout has exposed lithics, which are coming out of a buried natural stratum, while rodent burrows are also bringing lithics to the surface.

30Y141 at rafting campsite
The site is a historic camp on the east side of the Firth River on the bank rim, on top of the first terrace at the west end of a ridge that ends in a drainage channel. The site is 2.25 km west of the third creek west of Glacier Creek and large drainage basin is on the other side of the river. On the south bank of creek on the same terrace is a precontact scatter that extends for 50 m. Below this on a low terrace is additional historic refuse and the probability of another buried precontact component. The area is hummocky ground, dry with spruce stands, willow and berries. A gold mining operation sometime between 1889 and 1947 is evidenced by a tent area, cut tree poles, bottles, cans and other camp refuse. A Western Thule occupation between A.D.1000 and 1778 is indicated by a possible tent ring south of the creek, with bone exposed in the trail.

30Y193 at rafting campsite
The site is on the west side of the Firth River on the north part of a low terrace just upstream from the oxbow on the Firth River, about 2.5 km upstream from Joe Creek. The site, associated with the Historic Inuvialuit (A.D. 1778–1995), consists of one tent ring, three semi-circular rock features and axe cut trees.

30Y207 at rafting campsite
The site is on a low terrace promontory on the west side of the Firth River about 2.5 km north of Wolf Creek. The site starts on the west and continues to the east end of the promontory. Rock face cliffs are on the east side of the river, which takes a bend sharp to the west then to the east. It consists of two houses, three tent rings, seven hearths, flakes and bone and has been assigned a Western Thule affiliation between A.D. 1000-1778. About 150 m north is another blowout area with scattered bone that is likely associated.

Stokes Point
Umiaq Site 36Y (Burials)
The site is at the northwest end of a continuous spit that encloses Stokes Point Lagoon. It is on the very northwest corner of the terrace just below the high ground coastal plain. The site comprises part of an umiaq, four traditional burials with log covers, an unmarked but intact burial, an exposed skull and an above ground coffin. The latter, on a hill approximately 250 m southwest of the other graves, measures 1.84 m long by 49 cm wide by 27 cm deep and rests on 2 logs. The other graves are near the bank and three have associated wood artifacts. A two-sided lean-to measuring 4.1 m by 3.9 m is located on the beach southeast of the graves, at the west end of stokes Point spit. Recent items including a plastic plug and oil drum are associated with this structure indicating that they are not related to the graves. The site is associated with the Historic Inuvialuit and probably dates between A.D. 1778-1987.

91Y (Structures and Burials)
The site is located on the southwest bank of Stokes Point Lagoon on a peninsula, which is a remnant of a spit that once divided the lagoon. It is 1.5 km north of the airstrip and covers the head of the spit and two hills on either side of a runoff channel. The site is divided horizontally into three components. The spit is a recent camp, the west hill is a

traditional burial ground and the east hill is an earlier historic camp, possibly related to the graveyard. The graveyard is a series of burials in a row, along the crest of the rise. There are three to five burials in close formation and difficult to distinguish. There is another burial just on the back of the crest and two more to the east of it. Some of the wood pieces may indicate additional burials.

2.3.4. Kluane

Bullion Creek/Slims River

The discovery of gold at Bullion Creek in the fall of 1903 led to a stampede of people to the area with 2000 claims staked by the spring of 1904. By May 1904, 1200 individuals were reported in the area and Bullion Creek was the scene of the most activity. Numerous cabins and tent camps and a large hotel were built at the mouth of the creek, while additional cabins and another hotel were built at the mouth of Sheep Creek. Unfortunately, high water on Bullion Creek and the discovery of richer gold deposits on Burwash Creek led to the rapid abandonment of the former area after only a couple months of mining activity. With a renewed interest in mining in the mid 1930s, the area was briefly returned to.

10Y1

The site is on the east side of Bullion Creek, at the mouth of Bullion Creek Canyon, 2.5 km north of Slims River. It was constructed in 1904 during the initial period of intense gold mining on Bullion Creek. Seven features were recorded including a log cabin, root cellar, possible cache, lean-to, camp fire, bench seat, and the outline of a three-room foundation.

Bullion City Site 10Y2

This is the largest mining-related site in the area and is located on either side of a dry creek bed 1.5 km east of Bullion Creek on the north side of an old road. Twenty-three features were recorded including a cookhouse, eight tent frames, six platform caches, root cellars, foundations, and a three-hole privy. The artifacts suggest a date of about 1890-1904. The site is believed to be a tent city briefly occupied during the 1904 Bullion Creek gold rush.

10Y3

The site is on the north bank of Bullion Creek, immediately southeast of the steepest canyon on Bullion Creek and 8.5 km northwest of Slims River. Site features include two-storey log cabin, an outhouse, two piles of sluice or flume boards and portable artifacts. The artifacts suggest a mid-1930s date.

10Y4

The site is on the east bank of Bullion Creek, about 7 km northwest of Slims River. The main feature is a log cabin 4 m x 5 m x 3 m high at the peak, built using post-on-sill construction, with logs chinked with moss and burlap. Portable artifacts associated with the cabin suggest a date after 1922.

10Y5
The site is on the north side of an old road approximately 300 m east of Site 10Y1 on the east side of Bullion Creek, 2.5 km north of the Slims River-Bullion Creek junction. The site includes a root cellar, corral, picket fence and a large log cabin. Stevenson (1982) suggests its size and location indicate that this was the Bullion City Hotel reported to be under construction in the 14 May 1904 edition of the Daily Evening Star (Whitehorse).

11Y1
The site is west of the mouth of Sheep Creek, 1 km west of the old Alaska Highway bridge on the Slims River. The site includes two log cabins, privy, garbage dump, rectangular log foundation and many portable artifacts. Artifacts and inscriptions in the buildings suggest the site represents the fine hotel and cabins built at Sheep Camp in May 1904 for the gold rush.

Alsek River Corridor
16Y2
The site is on the steep northwest slope of a beach terrace on the east bank of the Dezadeash River, 100 m north of Beachview Creek. It is about 600 m east of the confluence of Beachview Creek with Dezadeash River and northeast of the confluence with the Kaskawulsh River. The site is in the shelter of the ridge bordering the north side of Beachview Creek. The primary site feature is a cabin believed built by Scotty John's father and used by Scotty John.

16Y5
The site, commonly referred to the Park Creek Cabin, is on the west bank of the Alsek River about 0.6 km inland, 3.5 km north of Lava Creek; 1.4 km south of Park Creek and 0.9 km northwest of mouth of an unnamed creek, a small island is present in the Alsek River just opposite the site. The site consists of two V-notched log cabins and ancillary structures including what appear to be a log-covered ground cache, a possible dog shelter, and a pile of firewood. The area likely represents a mining site with components dating to the Kluane Gold Rush of the early to mid 1890s, and probably later as well.

Mush and Bates Lakes
17Y2
The site is at the base of a knoll on a terrace on the northwest shore of Mush Lake. A small creek enters the lake west of site. Access is by boat from Government Landing 9 km east of site or along trail from Mush Lake Warden cabin, 0.7 km southwest of the site. The cabin is about 5 m x 5 m and appeared to have had a flat roof, consisting of longitudinal ridge poles, with smaller diameter poles laid across them. The cabin was believed to have been erected by an old man during the 1930s and 1940s. Because the hiking trail cuts across the site, portable artifacts and the cabin itself are at risk from visitor activity. Threats include displacement of artifacts, trampling, removal of artifacts as 'souvenirs', use of wooden components as a source of firewood, and vandalism.

Kathleen Lake
29Y75
The site is along the trail on a high bank at the end of a prominent south facing point on the north side of Kathleen Lake at the west end of the lake. It is 0.3 km northwest of the Day Use Area boat dock, and approximately 3.5 km southeast of the entrance to Kathleen River. The site has surface recent historic and buried precontact components.

Kathleen Fire Hearth Site 32Y105
The site is on the crest of a former beach ridge, in a gravel driveway approximately 25 m west of the boat launch at the Kathleen Lake Day Use Area. It consists of a hearth with mammal bone fragments and fire-cracked rock eroding from a cabin access road where it crosses an abandoned beach ridge. A private cabin is 35 m north of the feature on the terrace.

Cottonwood Trail
Johobo Mine Site 29Y92
The site is on the east side of the Cottonwood Trail at Trail Marker 55.7, at the northeast corner of Johobo Lake, 1.8 km east-northeast of the mountain peak east of Johobo Lake and 2.1 km northeast of the mountain peak on the west side of Johobo Lake. The copper mine, in operation between 1940 and 1960, consists of building foundations and related mining artifacts. Much of the site has been cleaned up and the building(s) burned, leaving the remains of a large building foundation just east of Trail Marker 55.7, and campsite areas in the bush on the mountainside to the west of the trail marker.

Beloud Grave 29Y99
The grave is on the north side of Beloud Creek, on the edge of a high knoll overlooking the creek, 0.5 km west-southwest upstream of the Beloud-Victoria Creek confluence. The site is most easily accessed via the Cottonwood hiking trail by a narrow gully, clear of brush, approximately 200 m northeast of the site. The site is surrounded with low brush and the windswept crest of the knoll has areas of gravel and grass. It slopes very steeply down to Beloud and Victoria creeks on either side.

Donjek River
37Y Bighorn Creek Mouth Site No.1
The site is on the east bank of the Donjek River, north of the mouth of Bighorn Creek. It stretches for approximately 340 m along the Donjek River, flanked by gullies at either end, and extends back at least 50 m and perhaps as far as 80 m from the edge to the present bank. It is a rich multicomponent stratified site perhaps dating as far back as 8000 years ago. The site has yielded numerous lithic tools and animal bone, but is severely affected by wind erosion causing bank slumpage & blowouts.

39Y Bighorn Creek Mouth Site No. 2
The site lies on the high point on the north side of Bighorn Creek, which marks its confluence with the Donjek River. This well-stratified multicomponent site covers an area 95 m north-south and 73 m east-west along the eroding bank edge. Numerous lithic tools and debitage as well as faunal remains have been recovered from the site.

2.3.5. Quttinirpaaq

Fort Conger 16X
The site, on the northeast shore of Discovery Harbour first served as a wintering site for the Nares Expedition (1875) and Peary used the site several times eventually dismantling Greely's habitation to build the three huts that survive today (1899, 1900-1902). A burial is southeast of the main site, consisting of an oval outline of bricks measuring 2.5 m north-south x 1.15 m east-west, partly embedded in the ground. There is no record of expedition members being buried at Fort Conger and the burial may predate European arrival and was subsequently outlined by expedition members. Numerous other site features and artifacts are present including depressions, pits, 13 tent outlines, brick concentration, barrels, stove parts, portable forge parts and tin cans.

Kettle Lake
50X3
The site is located on a sparsely vegetated gravel terrace(s) at the south end of Kettle Lake in the small valley created by May Creek. The site consists of six caches, three cairns, two fox traps, one tent ring, a platform and two unidentified stone features. The site has been assigned a possible Thule affiliation (A.D. 1100-1700).

50X4
The site is located at the base of a small hill (mesa-like remnant of a river terrace) south of Kettle Lake. Two stone features (fox traps or meat caches), a bone scatter and soapstone fragments are present. The site has been surface collected and is an easy walk from Tanquary Camp.

Kettle Lake 50X7
Six localities situated on moraine deposits and river terraces around Kettle Lake were documented in 1965. Twenty-three "ruins" in six groups were identified and mid-passage dwellings with central hearths plus a square building with stone walls (possibly a common kitchen) were recorded. At least six tent rings appear to have been excavated. In 2000, 20 features were recorded including 15 house/ring features of various diameters. Radiocarbon dates place the site within the Independence 1 Culture (4000 – 3700 years ago).

Kettle Lake Outlet 50X8
The site is on a large, flat, unvegetated terrace about 2 km from Tanquary and north of Kettle Lake, just north of a high ridge with a visible marker cairn on it. The primary site feature is a large divided stone house with several internal components. A considerable amount of bone is present on the surface. The site may be related to the Independence 1 Culture, 4000 - 3700 years ago.

Very River
Midnight Site 50X25
The site is located on a flat, barren gravel terrace 1.25 m above Very River (summer level) on its south bank, east of an unnamed river. The site is considered significant and

is vulnerable to human impacts due to its proximity to a hiking trail. The site consists of one tent ring with a flagstone floor and 11 flint knapping localities. The form of the lithic artifacts indicates a possible late Dorset period of occupation somewhere between A.D. 700 – 1100.

Daylight Site 50X26
The site is on a gravel terrace 5.5 m above the Very River on its north shore (first terrace above water). A dwelling with a hearth, and a tent ring have been completely excavated and two other features (possible tent rings) were also tested. One other tent ring, an unknown feature and two caches are also present. The site probably relates to the Independence I Culture (4000-3700 years ago).

Lake Hazen
Rivendell Site 50X40
The site is on the north shore of Lake Hazen at the west end of the lake between Adams and Turnstone rivers. It is on a gravel terrace on the hiking trail between Lake Hazen and Tanquary Fiord and is accessible by helicopter, foot, and boat (Hazen Camp). Three dwelling structures, six caches and several lithic, bone and ivory artifacts have been identified. Radiocarbon dating indicates a Transitional Independence I/II cultural affiliation from 3190-2710 years ago.

Ruggles Outlet Site 50X73
The site is on the west bank of the Ruggles River at its outlet to Lake Hazen. It is one of the richest precontact sites in the park in terms of artifact collections. It is an extensive Thule camp, likely dating to A.D. 100-1700 with many diagnostic bone, antler, ivory, lithic and wood artifacts. Two winter houses, one tent ring, two slab caches, and a fox trap are present.

Other Sites
50X165
The site is on the south bank of the Adams River near a hiking trail on a low boulder strewn knoll opposite where the river straightens and flows against a steep cliff on the north side. A boulder covered beach lies to the north and a gravel bar to the west. Two dwellings and five caches comprise the site and bone fragments are scattered. The site is assigned a Thule cultural affiliation from A.D. 1100–1700 based on the form of the features.

2.3.6. Tuktut Nogait

300X189 (Burials)
The site lies on the west side of the Hornaday River, atop the highest bluff in the area, just east of a small lake, and south of a creek. The creek runs eastward down the bluff and into the Hornaday River. A long lake, generally oriented north-south, lies about 1.6 km to the west-southwest, and a very large, unnamed lake lies about 3.7 km to the south-southwest. The site consists of two graves, covered by slabs and boulders, with chambers about 1m square. Pieces of wood are scattered around the perimeter of each grave, which

are 10 m apart, centre-to-centre. The graves could relate to either Copper Inuit or Mackenzie Inuit, dating as far back as A.D. 1725.

300X246 (Possible Burial)
This site is on the west bank of the Hornaday River, on east-sloping land about 0.5 km south of La Ronciere Falls. A bare knoll is located about 150 m north of the site. It is speculated to be a grave, based on the similarity of features (made of wood) in Ivvavik (Adams 1999).

300X284 (Burial)
The site is high atop the edge of a rocky outcrop, above the western bank of the Hornaday River. It is just east of a small tundra lake and about 100 m north of a creek, and lies between the large site 300X183 and the graves at 300X189.
300X321 (Possible Burial)
The site is located on a high point of land on the west side of the Hornaday River 1.5 km away, and backing on a small low spot containing a lake and three small ponds feeding the Hornaday River by a stream. The presence of possible grave goods and bone, and the unusual form of the feature suggest it is a possible grave. It rests about 6 m from the northwest corner of the landform in a rock strewn gravel-topped ridge with boulders and some exposed bedrock and light vegetation cover.

3. Analysis of environmental effects

3.1. Description of activities

3.1.1. Non-motorized boating

Guided rafting activities involve groups of 8-16, depending on the boat size. Guided kayaking/canoeing trips also occur in smaller groups, often on oceans. The trips are on river water of varying levels of difficulty and involve varying levels of involvement from participants. Trips are multi-day and involve camping overnight. Rafting currently occurs in Ivvavik and Kluane from early-June to the end of August. Kayaking and canoeing could occur in any of the parks between June and September. Sea kayaking is a growing activity in Sirmilik.

Accessory activities include:

- use of park facilities at staging areas including parking areas, privies, and garbage containers; and
- hiking away from the river along the trip.

3.1.2. Hiking

Primary activities include day hiking, interpretive hiking, and glacier walking on established or informal trails and routes. In Kluane, commercial operations involved in these activities primarily utilize existing trails on obvious walking surfaces with signs, although not exclusively, with the majority of backcountry use occurring along generally used routes. Guided excursions are usually staged from existing trailhead facilities and

groups make use of access roads, parking areas, privies, and garbage containers. The majority of day-hiking guided activities take place during daytime hours between 9 a.m. and 6 p.m.

Hiking can occur in all other parks as well. In the other parks no trails exist and hikers follow routes where there is no formal path and Parks Canada does not maintain the route. Hiking is usually overnight. Most hiking occurs in June, July and August.

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 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. Mountaineering

The primary activities falling under mountain guiding include hiking and backpacking primarily off established trails for the purpose of accessing mountaineering areas as well as technical climbing and general mountaineering. Mountaineering occurs in Kluane, Auyuittuq, Sirmilik and Quttinirpaaq. In Kluane, mountaineering primarily occurs in the glacier fields, with no exposed vegetation or ground. In the other parks, mountaineering occurs in glacier and non-glacier areas. No commercial mountain guiding occurs in the winter in these parks (for winter activities see Section 3.1.4). Many mountaineering excursions in Auyuittuq, Sirmilik and Quttinirpaaq utilize the same routes as hiking for accessing climbing and mountaineering areas.

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. Winter

Commercial winter activities include skiing and ski mountaineering on and off established trails. Although this activity could take place in any park, currently these activities only take place from March to May in Auyuittuq and Sirmilik; mid-October to late May in Ukkusiksalik; and November to April in Kluane. Skiing may also occur in Quttinirpaaq if visitors come early in the hiking season while there is still snow. Day trips and multi-day trips are included. Cross-country skiing on established trails is also included in this class. As with guided hiking, many winter excursions are educational,

although the focus is usually on outdoor skill development and adventure as opposed to natural or cultural history interpretation.

3.1.5. Overnight

Overnight use only occurs in association with the other sub-classes (for example groups canoe, hike, ski or raft to the camping location) and the size of groups will depend on which activity occurs around overnight camping. Primary activities involving 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.

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 allowed using wood supplied by the park or by gathering deadwood. 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.

3.1.6. Motorized boating

Motorized boat use takes place on large lakes, rivers and oceans in Auyuittuq, Sirmilik and Kluane. Motorized boats are used when fishing and to reach fishing areas in Kluane. Boats average 16 to 18 feet on Kathleen Lake in Kluane with 20 to 40 HP motors (occasionally up to 20 feet with twin 100HP motors). Mush Lake in Kluane has smaller boat and motors sizes because only 4x4 vehicles can access the lake. They average 14 to 16 foot in size (small enough to be car toppers or inflatables) with 10 to 25 HP motors. Motorized boats are also used to bring visitors by ocean to Auyuittuq and Sirmilik (July 1 to mid-November) and to show them the parks from the water. Motorized boats will likely also be used in Ukkusiksalik. Cruise ships are not included in this class screening.

3.1.7. Horse Outfitting

The business licences that pertain to this screening include day rides and wilderness trips that are staged from horse stables located outside Kluane. No horse use occurs in any other park. Wilderness trips use trails in wilderness areas and camp at designated horse campsites or in semi-permanent camps (Parks Canada 2002d). Guided horse activities share the trails and landscape with other user types such as cyclists and hikers as well as wildlife.

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, and garbage containers;
- 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; and
- Pack stock support for hiking groups.

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

3.1.8. Dog-sledding

Dog teams and sleds are used in Auyuittuq, Sirmilik, and Kluane currently but could be used in other parks as well. This activity provides a unique experience as well as the opportunity to see the park landscapes. Some trips are day trips, for example taking people into Auyuittuq to begin ski trips. Some trips are overnight trips, giving the experience of travelling by dog sled. The number of sleds depends on the number of people and purpose of the trip.

3.1.9. Fishing

Guided fishing includes both fly-fishing and spin-fishing on lakes, rivers and streams. Spin-fishing takes place from motorized boats as well as the shore. Guided fishing as a primary activity occurs only in Kluane, but could occur as a secondary activity on other trips, for example rafting trips in Kluane and other parks. Fly-fishing takes place from the shore and from standing in the water in streams and rivers. Fishing is required, by park regulations, to take place between sunrise and sunset. Guided fishing occurs on a seasonal basis when the ice is off lakes and rivers.

Accessory activities include:

- use of park facilities including parking areas, boat launches, privies, garbage containers, and public telephones;
- obtaining access to fishing locations by using existing hiking trails and camping areas and by going off-trail;
- use of motor boats on lakes and large rivers; and
- support facilities (docks, fish cleaning tables, boat storage areas).

3.1.10. Over-snow vehicles

An over-snow vehicles according to the *National Parks Highway Traffic Regulations* is defined as a vehicle that is designed to:
a) be driven by any means other than muscular power;
b) runs on tracks or skis or both; and
c) operate on snow, ice.
Currently some over-snow vehicle use involves taking visitors into parks for the day to visit points of interest. Over-snow vehicles are also used to take visitors from communities near the park into the park so they can hike or ski (over-snow vehicle use is for the day, but trips usually are multi-day). Occasionally an over-snow vehicle trip may

be multi-day. Aulavik, Tuktut Nogait, Kluane, Quttinirpaaq, Sirmilik and Auyuittuq are the parks most like to have over-snow vehicle use.

3.2. Unique characteristics

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. For example, in Kluane, commercial rafting groups are 14 or 15 people in size, but non-commercial rafting groups average 8 to 12 people. For other non-mountaineering backcountry (overnight) activities in the Kluane, commercial groups have an average group size of eight or nine people and non-commercial groups average two to three people. Similarly in other parks, commercial groups tend to be between eight to twelve. Large groups have the potential to result in increased disturbance to wildlife and vegetation and may detract from visitor experience (Monz et al. 2000). 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. Larger groups are also less likely to have negative grizzly bear encounters. Commercial groups may also provide different overnight accommodation with more tents (for example common areas/eating) and/or base camps. Yet if commercial guided groups implement the mitigation to protect the environment, many of the negative impacts associated with camping in a large group can be avoided (Monz et al. 2000).

3.3. Analysis of environmental effects and mitigation

The activity specific analysis focuses on environmental effects that most commonly occur as a result of 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 (see Table 4). 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). For each VEC general environmental effects and mitigation is identified that applies to all activities. If an activity has additional environmental effects requiring mitigation, they are described in separate sections.

In Appendix 2 and 3 full mitigation measures were described to be used by guides when conducting guiding operations. The following represents a summary of those mitigations, referring to them or repeating them where appropriate. 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 below, 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. Business operators and guides are expected to follow other laws and regulations as applicable (i.e. boat safety). Alsek River Guidelines must be followed when rafting on the Alsek River. All visitors must take part in mandatory orientation before visiting Quttinirpaaq, Sirmilik, Auyuittuq and Ukkusiksalik.

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.

Table 4. Analysis of potential environmental effects on valued ecosystem components by activity.

	Valued Ecosystem Component					
Activity	**Vegetation and Soils**	**Wildlife**	**Aquatic Resources**	**Cultural Resources**	**Aboriginal Land Use**	**Visitor Experience**
All Activities	Vegetation trampling/compaction Collection of plants/wood Introduction of non-native species Erosion Contamination	Displacement from habitat/movement corridors Habituation Behaviour modification Destruction of nests	Damage to riparian areas Diminished water quality	Damage of cultural resources Removal of cultural resources	Disturbance of Aboriginal land use Diminished visitor experience	Diminished visitor experience
Mountain-eering	Contamination Soil compaction Vegetation trampling					Diminished sense of wilderness
Overnight	Soil compaction Vegetation trampling Contamination	Habituation Behaviour modification				
Motorized boating	Shoreline erosion Introduction of non-native species		Introduction of non-native species Disturbance of fish habitat Contamination of water Disturbance of marine mammals and seabirds			Diminished visitor experience

	Valued Ecosystem Component					
Activity	**Vegetation and Soils**	**Wildlife**	**Aquatic Resources**	**Cultural Resources**	**Aboriginal Land Use**	**Visitor Experience**
Horse Outfitting	Introduction of exotic species Soil compaction Erosion Contamination		Damage to riparian areas			Diminished visitor experience
Dog-sledding	Tree damage	Disease/virus/ parasite transmission Wildlife disturbance	Contamination of water			
Over-snow vehicles	Vegetation damage Soil compaction	Wildlife disturbance	Contamination of water Damage to riparian areas			
Winter		Wildlife disturbance				
Fishing		Habituation Behaviour modification	Killing of fish Habitat disturbance Introduction of non-native species Diminished visitor experience/ wildlife attraction			

	Valued Ecosystem Component					
Activity	**Vegetation and Soils**	**Wildlife**	**Aquatic Resources**	**Cultural Resources**	**Aboriginal Land Use**	**Visitor Experience**
Non-motorized boating			Disturbance of marine mammals and seabirds			

3.3.1. Vegetation and soils

The following section describes impacts on vegetation and soils that may occur as a result of any of the activities in the MCSR. The environmental effects and mitigation for all activities are first described. If necessary, additional environmental effects and mitigation for specific activities are described. The discussion is generalized for all vegetation types because impacts and mitigation are similar regardless of the vegetation type, particularly with the low numbers of people involved in these activities.

Environmental effect	Mitigation
All activities	
Vegetation trampling/compaction	• Extensive mitigations for trampling and compaction are described in Appendix 2 Section 1.1. In addition specific mitigations for sensitive sites are described in Appendix 3.
Collection of plants/wood	• As part of a pretrip briefing, ensure that all clients are aware of national park regulations on picking or removing vegetation. Brief clients on travel procedures including potential impacts to vegetation and soils prior to departure. Warn clients not to eat any edible plants or berries.
Introduction of non-native species	• Request that clients check for and remove any bur-like seedpods or mud from boots, clothing and pets and dispose in garbage containers prior to departure to reduce risk of new weed infestations.
Erosion	• Extensive mitigations for erosion are described in Appendix 2 Section 1.1.
Contamination	• In Kluane, the only place fires are allowed, the mitigation for fires outlined in Appendix 3 Section 4.4 must be followed. • Pack out all garbage and food waste. Garbage or food waste shall not be buried or otherwise disposed of in the backcountry. Garbage shall not be burned in any park other than Kluane.
Mountaineering	
Contamination	• If garbage is burnt, carry out all remaining material including foil and ash.
Soil compaction Vegetation trampling	• Instruct clients on the sensitivity of alpine vegetation to trampling and disturbance. • Select routes and stopping areas on hardened surfaces whenever possible in alpine areas.
Overnight	
Soil compaction Vegetation trampling	• Make use of existing designated campgrounds and tent pads where possible, appropriate and available. • Select campsites in durable locations where signs of occupation will be minimal, especially for base camps. Disperse tents, avoid repetitive traffic routes and concentrate kitchen and tarp sites where possible on rock,

Environmental effect	Mitigation
	sand or gravel or naturally unvegetated sites. Avoid vegetated areas. • Do not dig trenches around tents or build rock wind breaks. • Do not remove any rocks from any features that look – even remotely – like an archaeological site, for example, tent rings, fox traps and food caches. • If rocks are used to secure tents, return them to their original position and location. • Wear soft shoes around camp to minimize the impact around the campsite. • 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. • Do not "clean" sites of organic litter. Renaturalize campsites and rest stops when leaving covering scuff marks, replacing sticks or branches, raking matted grasses etc. • Monitor the impacts around campsites and move or rearrange camp as necessary to avoid permanent damage to vegetation or soils.
Contamination	• Before leaving ensure the site is as clean or cleaner than it was found.
Motorized Boating	
Shoreline erosion	• Avoid producing a wake that disturbs the shoreline and can cause erosion. Approach inshore areas at slow speeds to minimize disturbances to banks, shorelines and shallow water habitat.
Introduction of non-native species	• To avoid the introduction of exotic species, always clean the hull and propeller of a boat before transferring it from another body of water. Clean and inspect the boat trailer as well. Remove all dangling or attached pieces of vegetation.
Horse Outfitting	
Introduction of exotic species	• Follow park procedure with respect to feeding horses.
Soil compaction and erosion and contamination	• Follow the mitigation in Appendix 2 Section 5.1 to reduce the area and severity of impacts.
Dog-sledding	
Tree damage	• Do not allow dogs to run free around camp. They must be in their harnesses or picketed. They must not be tied to trees, but to self carried anchors or to a rope that is stretched between two trees. Trees must not be limbed to make beds.
Over-snow vehicles	
Vegetation damage and soil compaction	• Where over-snow vehicle trails exist from previous trips, use the same trails.

Environmental effect	Mitigation
	• Avoid vegetation as much as possible. • Ensure the depth of snow is adequate to prevent damage to vegetation riding over.

3.3.2. Wildlife

The following section describes impacts on wildlife that may occur as a result of any of the activities in the MCSR. The environmental effects and mitigation for all activities are first described. If necessary, additional environmental effects and mitigation for specific activities are described.

Little research has been conducted on the impacts of recreational activities on arctic wildlife. As a result, the following discussion addresses impacts in all parks, but is based on the information available for Kluane. 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. The extent of these impacts varies with the number of people and activities in an area. The following analysis is general to all areas of all parks (unless otherwise specified).

Species at risk have been identified in Section 2.2.2. Only two species (peregrine falcon (*Falco perigrinus anatum*) and ivory gull) are on Schedule 1 of SARA. The peregrine falcon usually nests in places that are inaccessible to people, such as cliff ledges near steep cliffs. Mountaineering participants could be in these locations, except that the mountains climbed in Kluane are almost exclusively in the icefields where peregrines do not breed. As a result, it is unlikely that nests would be disturbed. Peregrine falcons in the Yukon are at healthy population levels. Their recovery occurred while these activities were ongoing in Kluane (http://www.environmentyukon.gov.yk.ca/fishwild/falcon.shtml November 10, 2003).

The ivory gull does not appear to breed in these parks, but is transitory during the summer or migration. In Quttinirpaaq and Sirmilik the number of visitors is so low that at this time visitation is not expected to impact the ivory gull. In Auyuittuq the birds are restricted to a small area of the park during migration. Since migration does not occur at the peak visitor season, it is not likely these birds would be impacted by these activities. The following mitigation would minimize the potential of any impacts occurring and if further information became available or their status changed, the CSPR form could be used to prescribe additional mitigation.

The following general mitigation will protect other species at risk. The only species at risk where visitor activities have been directly linked to the protection of the species is bears. The destruction of the individual or the removal from its habitat could be required if a bear became a public safety hazard. As a result, the following mitigation will include measures to prevent interactions with bears. There is no evidence that the low numbers of visitors in these parks are negatively impacting any other vulnerable species and therefore the general mitigation described below will protect them. If further information

becomes available that indicates new mitigation is required, this mitigation would be identified in the CSPR.

Environmental effect	**Mitigation**
All Activities	
Displacement from habitat/movement corridors	• Follow wildlife viewing protocols described in Appendix 2 Section 1.2. Also follow the site-specific mitigation in Appendix 3.
Habituation	• Follow proper food and smell management practices described in Appendix 2 Section 1.2.
Destruction of nests	• Maintain a distance of at least 300 metres from known wildlife den sites, calving areas and nest sites. Minimise close contact with nesting birds or young animals. • Watch for bird nests and chicks so as not to step on them; many arctic birds are ground nesters. Section 6(a) of the *Migratory Birds Regulations* states that no one shall disturb or destroy nests or eggs of migratory birds. • Leave the area immediately in the event that dens, nests or young animals are accidentally encountered.
Over-snow vehicles	
Wildlife disturbance	• Educate clients on the potential impacts of winter recreation and on minimum impact practices as applied to winter activities. • Minimise the number of individual over-snow vehicle tracks established into an area. • Do not follow wildlife tracks in order to ensure or enhance viewing opportunities. • Where feasible avoid early morning or night trips to minimise impacts to nocturnal wildlife.
Winter	
Wildlife disturbance	• Educate clients on the potential impacts of winter recreation and on minimum impact practices as applied to winter activities. • Minimise the number of individual snowshoe or ski tracks established into an area. • Do not follow wildlife tracks in order to ensure or enhance viewing opportunities. • Where feasible avoid early morning or night trips to minimise impacts to nocturnal wildlife.
Overnight	
Habituation/behaviour modification	• Follow best practices for overnight activities as described in Appendix 2 Section 3.2.
Fishing	
Habituation/behaviour modification	• Dispose of entrails properly to reduce the risk of attracting bears and creating a safety hazard for visitors (Parks Canada

Environmental effect	Mitigation
	2002c). Use fish cleaning and disposal facilities where provided. In backcountry areas where bear-proof garbage bins are not accessible, dispose of entrails by puncturing the swim bladder (this allows entrails to sink) and deposit into deep water, using a boat if available (Parks Canada 2002c). • Always clean your catch well away (300 m) from campsites, picnic sites, docks or other facilities.
Dog-sledding	
Disease/virus/parasite transmission	• Ensure all dogs are on leashes or fixed lines at all times. No dogs are allowed to run free. • While in the park and a few days prior to entering the park, feed dogs only commercial dog food. If dogs never eat commercial food, traditional food is acceptable. • Provide Parks Canada with records (with dates) of your de-worming program and vaccinations (for at least distemper, parvo and rabies) signed by a practicing veterinarian.
Disturbance to wildlife	• When storing and managing dog food, follow the same mitigations as for human food.

3.3.3. Aquatic resources

The following section describes impacts on aquatic resources that may occur as a result of any of the activities in the MCSR. The environmental effects and mitigation for all activities are first described. If necessary, additional environmental effects and mitigation for specific activities are described. The following analysis is general to all areas of all parks, unless otherwise specified. The impacts to salt water, fresh water and glaciers are not differentiated because they would be similar.

Environmental effects	Mitigation
All activities	
Damage to riparian areas	• Advise clients to bring their own water where feasible. • When group water resources must be refilled, select access points on durable materials or use crossing structures wherever possible. All water should be considered potentially contaminated and should be boiled, or filtered and treated chemically to eliminate water-borne pathogens. • 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 (do not construct temporary bridges) to minimize damage to stream banks at water crossings. • Use alternate travel routes to and from the waters edge to

Environmental effects	Mitigation
	avoid the development of new informal trails.
Diminished water quality	• 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. • Minimize use of soap and use biodegradable soaps for dishwashing and bathing when soap is necessary. • Bathe or wash away from water sources (50 m) 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. Residual soap should not be dumped in lakes or streams. • Dispose of gray water by screening and/or removing all food particles, then dispersing (Auyuittuq shallow sump hole) 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. Refuelling of camp stoves should occur 100 m from the high water mark of any water body, and an absorbent cloth should be used to catch minor spills. • Do 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. Cigarette butts, candy wrappers and twist ties must also be packed out. • Minimize the amount of food, cans, bottles and tin foil taken into the park to reduce litter. • On your way out – when your pack is lighter – try to pick up any litter left by others. Report any large accumulations or large items, such as empty fuel drums, to park staff. • Follow the mitigation for management of human waste and site-specific concerns as described for each park in Appendix 3.
Fishing	
Killing of fish	• Follow the catch and release and fishing mitigation identified in Appendix 2, Section 9.2.
Habitat disturbance	• Avoid wading in rivers, creeks or steams when fish are spawning in that particular area. This requires knowledge of species diversity in the different streams, rivers and creeks as well as their biology.

Environmental effects	Mitigation
Introduction of non-native species	• Always rinse all mud and debris from all waders and gear that will enter the water to avoid introducing exotic species. If waders or equipment are known to come from an area heavily affected by whirling disease, disinfect the equipment with bleach (1 part chlorine to 9 parts water for 10 minutes), rinse and let dry in the shade (The Whirling Disease Foundation).
Diminished visitor experience/wildlife attraction	• Fish entrails should be sunk in the middle of the lake after puncturing the swim bladder or packed out.
Motorized boating	
Disturbance of marine mammals and seabirds	• Follow the marine mammal and seabird best practices described in Appendix 2, Section 4.2.
Introduction of non-native species	• To avoid the introduction of exotic species, always clean the hull and propeller of a boat before transferring it from another body of water. Clean and inspect the boat trailer as well. Empty the bilge and live well as tiny invertebrates and larval organisms can survive and be transferred in the water. It is best to clean boats and empty bilge water and live wells immediately after exiting a water body. If that has not been done, ensure that cleaning and emptying of water is done well away from any other water body. • Avoid using cleaners that contain phosphates and other toxic cleansers.
Disturbance of fish habitat	• Avoid passing over shallow spawning habitat where propeller wash may disrupt habitat and/or smother eggs and larval fish.
Contamination of water	• Follow safe fuelling practices described in Appendix 2, Section 4.2.
Dog-sledding	
Contamination of water	• Stop dog sleds in the same location each trip to encourage dogs to defecate in contained locations. Clean up and transport out of park on a regular basis • Clean-up feces at the trailhead and on the trail on a regular basis as agreed to by Parks Canada. • Tie all dogs at lease 100 m from any water body to help control the spread of giardia virus in the park. Dog scats that are on frozen water surfaces should be picked up and moved at least 100 m from the shoreline.
Over-snow vehicles	
Contamination of water	• Ensure vehicle is well maintained and tuned. • Install proper jets for the elevation the vehicle will be operating at and adjust the clutch accordingly to reduce emissions.

Environmental effects	Mitigation
	• Do not use after-market performance "pipes". • Use biodegradable synthetic low-particulate lube oil. • When purchasing new machines, consider more environmentally friendly models. • Fuel should be kept in sealed containers and appropriate nozzles/funnels should be used during refuelling. Refuelling should take place 300m away from rivers, lakes or ponds. Absorbent cloths should be used to catch minor spills.
Damage to riparian areas	• Use of frozen water bodies is encouraged to limit the amount of damage done to vegetation. Climbing riverbanks for shortcutting oxbows, etc. should be minimised to protect against erosion. • When crossing riverbanks, select locations where snow cover is thick enough to buffer the bank from the effects of treads. • When crossing watercourses banks approach at a 90^{o} angle whenever possible to minimize disturbance to underlying soils and vegetation and prevent possible bank erosion. • When crossing a watercourse, choose the shallowest sloping location of the bank in order to reduce the impacts of treads on underlying soil and vegetation which can result in bank erosion. • Ensure there is adequate ice thickness to support the weight of the machine prior to crossing watercourses. Do not cross streambeds near areas where water is open.
Non-motorized boating	
Disturbance of marine mammals and seabirds	• Follow the marine mammal and seabird best practices described in Appendix 2, Section 10.1.
Horse Outfitting	
Damage to riparian areas	• Ensure that groups on horseback use Parks Canada authorized bridges wherever possible to minimise damage to stream banks at water crossings. • When crossing a watercourse, approach banks at a 90^{o} angle whenever possible to minimized disturbance and prevent possible erosion. • When crossing a watercourse, choose stable terrain and the shallowest sloping location of the bank in order to minimize damage to the bank that can cause erosion. • When watering, do not allow horses to concentrate in one area as this could result in damage to riparian vegetation, stream banks, and streambed habitat. • Do not allow horses to wade in areas of fish spawning habitat.

Environmental effects	Mitigation
	• Remove horse feces deposited in or near a body of water and dispose of at a minimum distance of 100m from the high water mark of any watercourse.

3.3.4. Cultural resources

The following section describes impacts on cultural resources that may occur as a result of any of the activities in the MCSR. The follow environmental effects and mitigation are for all activities. The following analysis is general to all areas of all parks, unless otherwise specified.

Environmental effects	Mitigation
Damage of cultural resources	• Educate clients about the value of cultural resources when at a cultural site. • Ensure that clients do not deface or write on rocks, outcrops, trees, logs or park infrastructure. • 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. • Do not remove or disturb any rocks from any features that look – even remotely – like an archaeological site. These sites include cairns, tent rings, fox traps and food caches and almost indiscernible to the untrained eye. • Additional mitigation for specific cultural sites as described in Appendix 3 must be followed.
Removal of cultural resources	• Ensure that clients do not remove any items from cultural sites nor vandalize the sites.

3.3.5. Aboriginal land use

The following section describes impacts on Aboriginal land use that may occur as a result of any of the activities in the MCSR. The environmental effects and mitigation are for all activities. The following analysis is general to all areas of all parks, unless otherwise specified.

Environmental effect	Mitigation
Disturbance of Aboriginal land use	• No interference with traditional activities is permitted. Visitors will not approach aboriginal camps unless invited by the members. Mitigation for protecting cultural resources, vegetation and soil will protect culturally important areas as well. Follow the site-specific mitigation identified in Appendix 3.

Environmental effect	Mitigation
Diminished visitor experience	• Inform clients about the right of Aboriginal people to participate in harvest for subsistence and the cooperative arrangements in place to ensure this harvest is sustainable.

3.3.6. Visitor experience

The following section describes impacts on visitor experience that may occur as a result of any of the activities in the MCSR. The environmental effects and mitigation for all activities are first described. If necessary, additional environmental effects and mitigation for specific activities are described. The following analysis is general to all areas of all parks, unless otherwise specified.

Environmental effects	Mitigation
All activities	
Diminished visitor experience	• Mitigation for group interactions, vehicle use and good practices is identified in Appendix 2, Section 1.6. Mitigation for appropriate fire (in Kluane only) use is described in Appendix 3, Section 4.4. Follow other site-specific mitigation in Appendix 3.
Mountaineering	
Diminished sense of wilderness	• 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, minimise the amount of gear left behind at anchor or rappel stations. Do not leave fixed line, glacier wands, food caches or broken equipment in the icefields. • When gear is to be left behind use dull or appropriately coloured bolt hangers, slings, or other gear. • Where possible and safe, place anchors discretely at the top of routes. • Use slings to protect trees used for anchors.
Motorized boating	
Diminished visitor experience	• Respect other park visitors and use the boat for travel to and from destinations, not for joy-riding.
Horse Outfitting	
Diminished visitor experience	• Remove horse manure from the campsite area and distributed in the surrounding area. • Report any horses that died to the warden service. • Horse use is only permitted in certain areas, please check with Parks Canada. • Follow site-specific mitigation as identified in Appendix 3.

3.3.7. Effects of environment on all guided activities

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, 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.

3.3.8. Effects of malfunctions or accidents from all activities

While not likely to occur, wildfire may occur as a result of an escaped or poorly extinguished campfire in Kluane. 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. Public safety requirements with respect to avalanches are included in the business licence conditions.

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, damage to vegetation or destruction of cultural resources may occur accidentally 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. Rock cultural resources (i.e. tent rings) could be disturbed without visitors knowing they have cultural significance.

Operators using gas motors may spill gas when refuelling or in the case of an accident. 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.

3.3.9. Effects of changes to the environment on socio-economic conditions from all activities

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. Although 42% of companies operating in Kluane are from Canada, only 18% are from the nearest community, Haines Junction. Although some employment and other economic benefits come from these businesses and the business of other commercial tours stopping in Haines Junction, the local economic benefits can be limited if commercial operators purchase all supplies outside Haines Junction and do not stop for meals or souvenirs. Similarly, although all the commercial operators in Ivvavik, Tuktut Nogait and Aulavik are from Canada, none are from the areas immediately around the parks, reducing the economic benefits in the nearest communities. Yet economic benefits from tourism are an increasingly important part of the economy in all of the whole territories of Yukon, Northwest Territories and Nunavut. For example, tourism strategies for local communities to encourage local business and guiding can be part of cooperative management agreements.

Impacts to the natural environment as a result of guiding activities are not expected to negatively affect the demand for guiding services, the type or scope of other visitor services, the level of visitation by independent users, or 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.

3.4. Significance and residual impacts

This section of the MCSR evaluates the negative environmental effects of a single project under the MCSR for the significance of environmental effects. As described in Section 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 on Aboriginal land use are considered significant if harvest success rates and traditional use experience decreased. 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 will be used to evaluate the significance of potential negative environmental impacts (see Table 1 for definitions). Each VEC will be evaluated for the significance of residual effects after mitigation, and the results are summarized in Table 5. 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 of multiple commercial operations are evaluated separately through the CSPR and business licensing review process (see Section 3.5).

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 that may be considered to be reversible over time with vegetation regrowth. 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 in any of the parks.

The potential introduction and spread of new non–native plant species that have not already been introduced to the 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 (food often contains non-native species and seeds can remain in the digestive system until defecation in the park), is restricted in geographic scope through the licensing process. 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 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.

Therefore, the activities of an individual commercial guiding licence are not likely to result in significant adverse impacts to vegetation in any of the parks.

Wildlife

The impacts of individual commercial guiding operations on wildlife species, including species at risk, are expected to be limited in geographic extent, duration, and frequency. Human/wildlife encounters are likely to result in disturbance level impacts only. Although some vulnerable species populations exist in the class screening area, there is no evidence that commercial guiding activities, after mitigation, would contribute to their decline. The activities of individual commercial guiding operations are not likely to threaten the continued existence of any wildlife species in any of the parks; therefore, the adverse impacts are not considered significant.

Table 5. Evaluation of the significance of adverse residual impacts on VECs before consideration of cumulative effects.

VEC	Aspect	Geographic Extent	Duration	Frequency	Reversibility	Magnitude	Significance
Vegetation and soils	Native vegetation	Neg.[a]	Neg.	Minor	Minor	Minor	Not Significant
	Non-native vegetation	Neg.	N/A[b]	Neg.	Con.[c]	Neg.	Not Significant
	Soils	Neg.	Neg.	Minor	Neg.	Neg.	Not Significant
Wildlife	-	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant
Aquatic resources	Native fish species	Neg.	Neg.	Neg.	Neg.	Minor to Con.	Not Significant
	Non-native aquatic species and diseases	Neg.	N/A	Neg.	Con.	Neg. to Con.	Not Significant
	Other aquatic species	Neg.	Neg.	Minor to Con.	Neg.	Neg. to Con.	Not Significant
	Water quality	Neg.	Neg.	Neg. to Con.	Neg.	Neg.	Not Significant
Cultural resources	--	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant
Aboriginal land use	--	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant
Visitor experience	Visitor satisfaction	Neg.	Neg.	Neg.	N/A	Neg.	Not Significant
Accidents and malfunctions	--	Neg.	Neg.	Neg.	Neg.	Neg.	Not Significant

[a] Neg. means negligible.
[b] N/A means not applicable.
[c] Con. means considerable.

Aquatic resources

Aquatic species will be affected in varying ways. The impacts of individual commercial guiding operations on species that are not being fished are expected to be limited in geographic extent, duration, and magnitude. The frequency of impacts will vary depending on the activity, but is still likely to be minor. Fishing will result in the loss of individuals from the population. However fishing is regulated to protect populations; therefore, the activities of one commercial guiding operation are not likely to threaten the

continued existence of any aquatic species. The impacts of an individual commercial guiding operation on whale and seal species, including those that are considered at risk, will be very limited in geographic extent, duration, magnitude and frequency. There is no evidence that commercial guiding activities would contribute to their decline. Therefore, impacts of a single commercial guiding operation are not likely to threaten their existence in any park.

The potential introduction and spread of new non–native aquatic species and diseases as a result of commercial guiding activities is considered unlikely after implementation of the standard mitigation measures. Reversing the effects of an introduction of an invasive species may require active management over a significant period of time and may never be completely successful. The introduction of new non-native aquatic species would result in disturbance level impacts to native species. However, if a new fish disease was introduced the impact could be fatal for some fish. Given the implementation of the standard mitigation, and invasive species control measures already in place by Parks Canada, individual commercial guiding activities are unlikely to result in an introduction, or further spread, of invasive species that would threaten the existence of aquatic communities.

The impacts of individual commercial guiding operations, not involving gas motors, on water quality are expected to be limited in geographic extent, duration, magnitude and frequency. Gas-powered motorized activities are of short duration, although an individual operation's activities could be daily. In large lakes or oceans impacts of contaminants from an individual commercial guiding operation are quickly diluted, limiting the geographic extent and easily reversing impacts. Impacts from regular operations after applying the mitigation are only expected to create disturbance level impacts. Given the implementation of standard mitigation measures, it is not likely that individual commercial guiding operations will have any significant effect on water quality.

Therefore, the activities of an individual commercial guiding licence are not likely to result in significant adverse impacts to aquatic resources in any of the parks.

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. Therefore there will be no significant adverse effects on the integrity or context of cultural resources or sites.

Aboriginal land use

Given the implementation of the standard mitigation measures it is not expected that the wildlife or vegetation populations will be affected by an individual commercial guiding operation; therefore, traditional harvest would not be affected. Visitor use from one commercial guiding operation is restricted geographically and occurs for a short duration, making interactions less likely and not significant.

Visitor experience
Interactions between commercial groups and any given independent user are expected to be short in duration, infrequent and relatively minor in nature. 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.

Accidents and malfunctions
Given the implementation of standard mitigation measures and management measures already in place by Parks Canada, it is not likely that most individual commercial guiding operations will result in accidents that will have significant effects on ecological or cultural resources or on visitor safety and experience. Although a spill from a motorboat or over-snow vehicle could destroy some individuals of a species, the probability of a spill is low and the possibility of severe damage is very low. If these events did occur, the effects would not impact the ecosystem or population. Therefore, after implementation of the mitigation measures, individual commercial guiding operations will not have significant effects on ecological or cultural resources or on visitor experience.

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 which 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. 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. Section 3.5.1 is an analysis of cumulative effects based on information available now.

However, the number of licences and activities to be evaluated over time is not known and additional projects could be initiated that would cumulatively impact VECs. Furthermore, the magnitude and significance of cumulative effects will vary over time as mitigation measures identified in the management plans are implemented, as patterns of human use change, and as ecological conditions vary. As a result, a process has been developed to evaluate cumulative effects of new and modified business licences annually and all licences every five years.

A two-tiered assessment process has been developed for evaluating the cumulative effects of commercial guiding activities. The first level of assessment integrates cumulative effects assessment with the annual business licensing 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. This process is described in Section 3.5.2.

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 park management plan review processes provides the focus for follow-up and reporting activities related to commercial guiding operations. This process is described in Section 3.5.3.

3.5.1. Current cumulative effects analysis

Cumulative effects may result from multiple projects covered by this MCSR and/or the interaction of projects covered by this MCSR and other past, present and future projects inside or outside of a park. In order for cumulative effects to be possible, there must be residual effects on a VEC. No residual effects were identified on cultural resources; therefore no analysis of cumulative effects is necessary for cultural resources. The cumulative effects on soils and vegetation, wildlife, aquatic resources, Aboriginal land use and visitor use will be analyzed below.

Soils and vegetation

Minimal residual effects on vegetation and soil may occur, but past, present and future visitor use, Aboriginal use, research and park operations are the only projects in the parks that could cumulatively impact soil and vegetation. All of these activities occur at very low densities and none of the vegetation species are known to be threatened by them. With the implementation of the mitigation measures in the MCSR and the management plans, the adverse cumulative environmental effects on soils and vegetation are not likely to be significant.

Wildlife

The analysis of cumulative effects on wildlife will be organized based on the type of projects in and around each park. Kluane and Quttinirpaaq will be discussed individually because of the unique projects around these parks. The other parks will be discussed together because they have similar projects that may affect wildlife.

Projects that could cumulatively impact wildlife in and around Kluane are: visitor activities, research activities, aircraft landings, settlement activity (highways, town etc.) around the park and Aboriginal land use. In 2002, "Kluane National Park and Reserve CEA Update" was produced to analyze the cumulative effects on wildlife of activities proposed by the Kluane park management plan and projects around the park. An assessment of the cumulative effects on wildlife in Kluane found that overall wildlife VECs will likely not be significantly adversely affected by the activities in the park and regional activities within the next five to ten years (Slocombe et al. 2002).

In and around Quittinirpaaq the following projects may affect wildlife: aircraft landings, visitor and researcher use of the park, Aboriginal land use, and military activities. The military station Alert is located 44 km west of the park and some operations occur in the park. The station was established in 1956 and had over 200 personnel stationed there from 1970 to the late 1990s. Currently approximately 65 personnel are stationed at Alert. Parks Canada works cooperatively with the Department of Defence to minimize the impacts of their activities on the park, including flying at acceptable heights to protect wildlife. Although some vulnerable species populations exist in this area, there is no evidence that visitor use, that has been ongoing for many years, would contribute to their decline.

In the other six parks, projects in and around the parks affecting wildlife include: aircraft landings, visitor activities, research activities and Aboriginal land use. As described by the introduction to Section 2.2, wildlife are managed cooperatively by external agencies who ensure that harvest by Aboriginal people is sustainable. As described in Table 2 the visitor use of these parks is very low. Park management plans identify any mitigation necessary to prevent adverse cumulative environmental effects of visitors and researchers.

Therefore, commercially guided activities are not likely to threaten the continued existence of any wildlife species in any location in the parks; therefore the adverse cumulative environmental effects are not likely to be significant. Since there are no

expected significant adverse cumulative environmental effects on wildlife, there will be no significant adverse cumulative environmental effects on Aboriginal hunt success.

Aquatic resources

Multiple guided businesses under this MCSR, non-commercially guided visitor use, researchers, park management, and float-plane landings may impact water quality and the distribution of non-native aquatic species. These activities all have very minor residual effects on water quality and are infrequent. Aquatic non-native species have not been identified in the parks and are unlikely after the implementation of the mitigation in this MCSR. As a result, adverse cumulative environmental effects on aquatic resources are not likely to be significant.

Multiple guided businesses under this MCSR, non-commercially guided visitor use, researchers, and in a few cases people fishing outside the park may impact fish populations. Fishing is regulated under the *National Parks Fishing Regulations*, territorial legislation and through cooperative management regimes to ensure that there are no significant adverse cumulative environmental effects on fish populations.

Aboriginal land use

Multiple guided business under this MCSR could cumulatively decrease Aboriginal land use experience. Aircraft landing and non-commercially guided visitors in the parks may also contribute to decreased Aboriginal land use experience. As described in Table 1 most parks have very low visitation making conflicts with visitors and decreased Aboriginal land use experience very unlikely. As described in Section 1.1.4 each of the parks is managed cooperatively with Aboriginal groups who address this issue as necessary. Furthermore, park management plans, developed with Aboriginal groups, identify appropriate activities, appropriate locations for activities and approaches to minimize conflicts between Aboriginal land use, aircraft and visitors. With the implementation of the mitigation measures in the MCSR and the management plans, the adverse cumulative environmental effects on Aboriginal land use are not likely to be significant.

Visitor experience

Multiple guided business licences under this MCSR could cumulatively decrease visitor experience. Aboriginal land use, non-commercially guided visitor use, and aircraft landings in the parks may also contribute to decreased visitor experience. As described in Section 1.1.4 each of the parks is managed cooperatively with Aboriginal groups who address conflicts between visitors and Aboriginal groups as necessary. Furthermore, park management plans, developed with Aboriginal groups, identify appropriate activities, appropriate locations for activities and approaches to minimize conflicts between Aboriginal land use, aircraft and visitors. As described in Table 1 most parks have very low visitation making decreased visitor experience due to overcrowding or encounters with Aboriginal people unlikely because people in very remote locations are more likely to enjoy encountering other groups. The management plan for Kluane, which has the highest visitation of the parks in the MCSR, identified indicators of wilderness character for many trails (Parks Canada 2002e). These indicators will be monitored and

management actions taken, as necessary, to ensure the targets are met. With the implementation of the mitigation measures in the MCSR and the management plans, the adverse cumulative environmental effects on visitor experience are not expected to be significant.

3.5.2. Integration of class screening and business licensing review process

Figure 4 outlines the annual business licensing and class screening process for proposed new or modified business licence applications. A prescreening 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 and Parks Canada (usually a team of people from public safety, resource management, and cultural management) evaluates the application and completes the CSPR evaluation for potential environmental effects, including cumulative effects. The results of the class screening process are documented in the CSPR.

3.5.2.1. Cumulative impacts to wildlife

Cumulative impacts to wildlife are assessed by focusing on the methods of impacts to wildlife, which are similar regardless of species. While the impacts of one guided trip alone is not significant (see Section 3.4), repeated impacts can cause more serious impacts. 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:

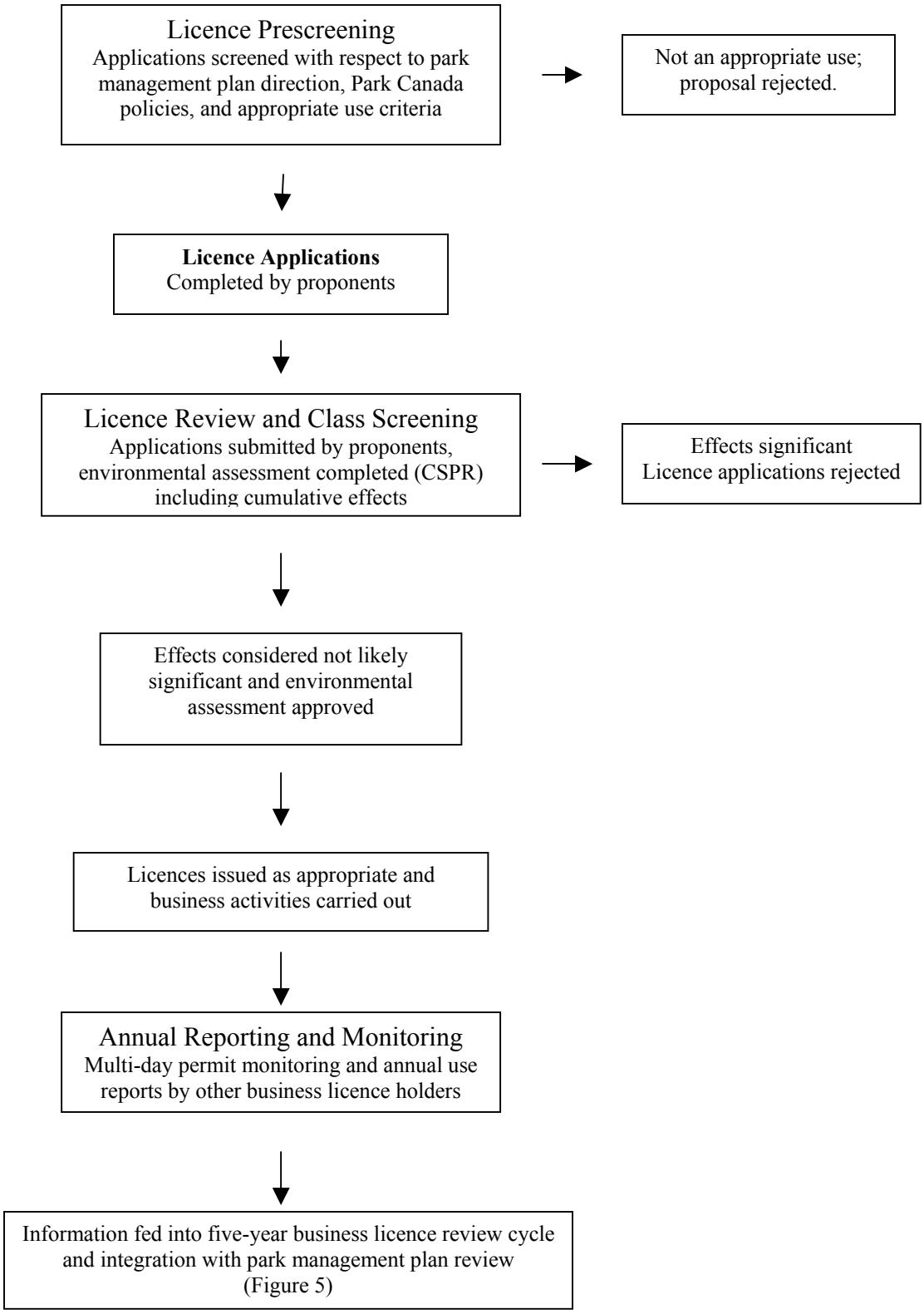
- Increase in human-wildlife interactions that may lead to habituation or human injury;
- Increase in human caused displacement of wildlife from prime food sources;
- Decrease in wildlife habitat effectiveness; and
- Disruption of wildlife during sensitive seasons including nesting, denning, rearing or breeding seasons.

3.5.2.2. 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.

Figure 4: Annual business licence and class screening review process



In order to focus the CEA on the issues and areas of greatest concern cumulative impacts to vegetation and soils, cumulative impacts are assessed by focusing on sensitive species and times, 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

3.5.2.3. Cumulative impacts to aquatic resources

Aquatic species, other than sport fish species, are not likely to be directly impacted by cumulative impacts. Sport fishing does remove individuals from a population and could impact the ecological integrity of a system or population. The cumulative effect of these actions by people fishing with or without commercial guides will vary from waterbody to waterbody. Evaluating whether or not fishing should be allowed is beyond the scope of this environmental assessment. Furthermore, ensuring fish populations are at desired levels requires the management of public fishing as well as commercial guided fishing. As a result, management plans for the national parks and the *General Fishing Regulations* of the *Canada National Parks Act* are the appropriate tools to regulate fishing and protect ecological integrity of the affected aquatic ecosystems.

The extent of non-native aquatic species and fish diseases is one of the indicators of ecological integrity identified in park management plans. Despite implementation of the mitigation, non-native species and fish diseases may be introduced into the park or spread further through the park.

Cumulative impacts to water quality are greater from other sources; however, commercial guiding could contribute to these impacts. The impacts vary over time and between waterbodies and need to be evaluated at a more specific level.

Specific cumulative effects indicators related to the selected components of the aquatic resources VEC to be assessed through the CSPR and business licence review process include:

- Decrease native fish populations
- Introduction or spread of new non-native species that are a particular threat
- Introduction or spread of new fish diseases that are a particular threat
- Increase accumulation of contaminants that could decrease water quality

3.5.2.4. 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 will focus on the sites identified in Section 3.2. Specific cumulative effects indicators related to the cultural resources VEC to be assessed through the CSPR and business licence review process include:

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

3.5.2.5. Cumulative impacts to Aboriginal land use

Repeated visitor use in the same area as traditional Aboriginal land use, could lead to decreased experience and harvest success. Specific cumulative effects indicators related to the cultural resources VEC to be assessed through the CSPR and business licence review process include:

- Decrease Aboriginal Land Use Experience
- Decrease Aboriginal Land Use Harvest Success Rate

3.5.2.6. 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

3.5.3. Integration of class screening and park management plan review process

Commercially guided activities, even cumulatively, 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, independent visitor use, aircraft overflights 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. 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 for each of the parks.

There are four main steps to the integration of cumulative effects assessment and the class screening process with each park management planning process as illustrated in Figure 6:

- Summary reporting on commercial guiding activity
- State of the park report
- Five-year park management plan review
- Amendments to the class screening process

Summary reporting on commercial guiding activity
Annual monitoring of multi-day use in Aulavik, Ivvavik and Tuktut Nogait occurs through a permitting system that tracks all parties. As a result, business licence holders offering multi-day trips in these parks are not required to submit annual reports. However in the other parks, annual reports are used to collect information on the number, location, and size of excursions.

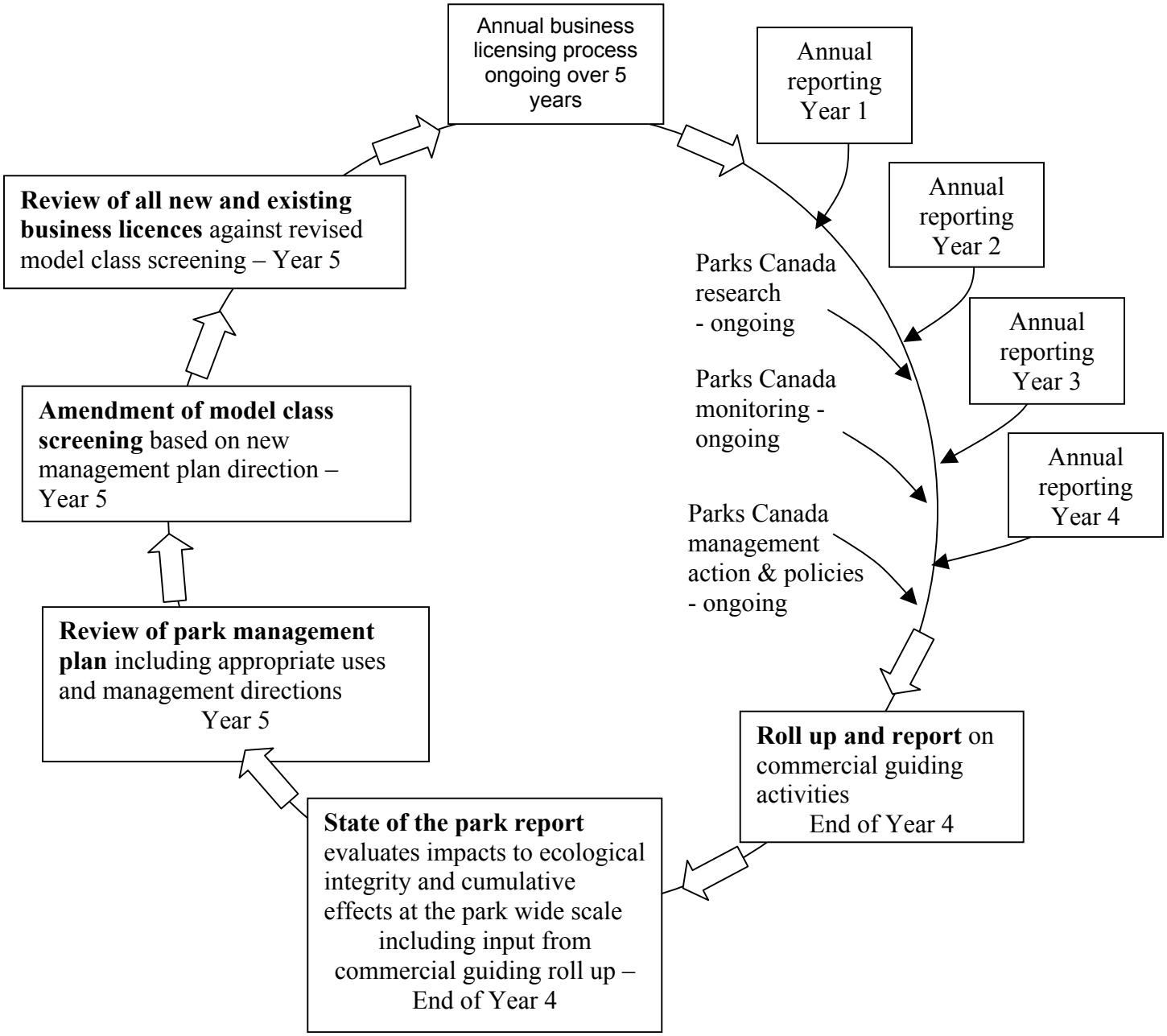
For all parks, business licence holders who fish during their trip must report the catch (species and approximate size) of fish after each trip. Bear sightings must also be reported after each trip. In preparation for the five-year management plan review, report information will be summarized to establish the locations of and trends in commercial use. This information will be reviewed to identify trends and issues of relevance to each 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 park report. Other information contributing to the state of the park report includes ecological integrity indicator monitoring, implementation of park management activities and other ecological or social research. The state of the park report will provide an evaluation of ecological integrity and cumulative effects at the park scale. This information is then used to guide changes to the management plan.

Five-year park management plan review
In order to address cumulative impacts, management plan for each park 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 five-year term of the management plan and the results of monitoring are used as input into the state of the park 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 park report. Management plan actions related to commercial guided activities would be prescribed for areas where the level of overall human use impacts is 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 as necessary. All business licences will then be reviewed using the amended model class screening to ensure that mitigation and licence stipulations are appropriate and up-to-date.

Figure 5: Five-year business licence review process for each park.



3.6. Surveillance

Surveillance of commercial guiding activities is on-going and ensures that required mitigation is implemented and restrictions or stipulations are followed. 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 *CEAA*, 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 permitting system, yearly reports by day users, end of trip reports of catch and bear sightings, 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 3.6.2. Parks Canada is responsible for on-going monitoring of ecological integrity indicators, trail/campsite 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 Agency. 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 Agency 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.

Aboriginal groups and cooperative management boards for the boards were consulted as part of the review of the draft model class screening. The stakeholder group considered most likely to have an interest in the class screening process was guiding business operators. Commercial operators could be concerned with the potential for additional restrictions and operational requirements that may be applied as mitigation. 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 Aboriginal people and 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 Aboriginal groups and 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; and
- 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 Agency 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. 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 consulted directly with Aboriginal groups through meetings and/or phone calls. Parks Canada staff followed up directly with 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. 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 was determined. Opportunity to review the draft screening documents was offered to interested stakeholders.

4.2. The Agency 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 required under section 19 of *CEAA*. 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 departments

Parks Canada has sole authority over all lands affected by 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* the Minister of Environment is responsible for all species at risk in national protected heritage areas administered by Parks Canada including national parks and national historic sites. The Canadian Wildlife Service was consulted with respect to the two bird sanctuaries located within Aulavik and Sirmilik. The Department of Fisheries and Oceans was also consulted for potential issues relating to water quality or fish habitat.

4.4. Territorial departments

The draft Model Class Screening Report was provided to the Inuvialuit Environmental Impact Screening Committee and the Nunavut Impact Review Board, but they did not have any comments.

4.5. 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.

4.6. 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 the 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 model class screening report and any related class screening project reports.

The Agency will post records required during preparation of a model class screening report (e.g., public notices regarding public participation).

Upon declaration of the model class screening report, the Agency requires responsible authorities to post on the Registry every three months a statement of projects for which a class screening 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
- the date of the decision for each project

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 the project, including class screening projects 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 Canadian Environmental Assessment Registry can be found in *The Canadian Environmental Assessment Registry: Practitioners' Guide*, prepared by the Agency.

5. Procedures for amending the Model Class Screening Report

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.

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Appendix 1

Class Screening Project Report
for
Commercial Guiding Activities
in the
Northern National Parks of Canada

Class Screening Project Report for Commercial Guiding Activities in the Northern National Parks of Canada

Introduction

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

The first portion of the Class Screening Project Report is to be completed by the applicant and Sections 4 to 7 will be completed by Parks Canada staff.

Section 1 – Applicant Information

Company Name		
Business License Application Reference #		
Purpose of Application Check One		New Business licence – environmental assessment required
		Change or Expansion of Existing Business License – environmental assessment required
		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 *National Parks Businesses Regulations 1998?*		
Is the business licence for operation in Kluane, Ivvavik, Tuktut Nogait, Aulavik, Auyuittuq, Ukkusiksalik, Quttinirpaaq, or Sirmilik National Parks or Park Reserves of Canada?		
Is the business licence for guided non-motorized boating (rafting, kayaking, canoeing), hiking, mountaineering, winter/ski-mountaineering, motorized boating, horses, dog-sledding, fishing, and over-snow vehicles. 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?		
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?		
Does the business involve a cruise ship?		

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

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

The *Standard Mitigation* column identifies the standard mitigation to be applied to the proposed activity. The *Activities/Areas* column identifies the specific activities included within each standard mitigation category. Please check all standard mitigation categories that apply to the proposed operation.

Standard Mitigation	**Activities/Areas**	
Commercial Guiding – Generic	This category applies to all commercial guiding operations	
Hiking	Includes interpretive hiking and day hiking on established trails and other approved non-technical terrain	
Mountaineering	Includes general mountaineering, rock climbing, and alpine climbing	
Winter Sports	Includes snowshoeing, cross country skiing, backcountry skiing (not including over-snow vehicles)	
Horsepacking	Includes day trips, and multi-day horsepacking trips	
Overnight	Includes camping at established sites or non-established sites	
Non-motorized boating	Includes rafting, kayaking and canoeing	
Motorized boating		
Dog-sledding	Includes day trips, and multi-day trips	
Fishing		
Over-snow vehicles		

Note: Standard mitigation measures as described above are to be attached as conditions of the business licence under; *Business Licence Schedule A) Section 3) "Environmental Stewardship"*. Activities will not be allowed in any areas not identified above. This stipulation will be attached as a condition of the business licence under: *Business Licence Schedule A) Section 2) "Locations"*.

B) Which park(s) will you be operating in?

Kluane……..	☐
Ivvavik…….	☐
Tuktut Nogait.……..…..	☐
Aulavik……...……..	☐
Ukkusiksalik…..…….	☐
Auyuittuq……..	☐
Sirmilik…….……..	☐
Quttinirpaaq……..…….	☐

C) This section identifies locations in the parks that have been identified as sensitive sites in the Model Class Screening Report. Additional mitigation is identified in the Model Class Screening Report for these sites and will be attached to your business licence. Which of the following sites will you be operating in?

Kluane

Logan Nunatak…….	☐
Steele Creek Alpine……..……	☐
Mt. Hoge/Dän Zhür/Donjek Valley…	☐
Bullion Creek Dunes…….……	☐
Tachäl Dhäl (Sheep Mountain) ...	☐
A'äy Chù; (Slims River) Delta…..	☐
Goatherd Mountain…….	☐
Lower Alsek River	☐
Sockeye Lake and River	☐
Fraser Creek Fen	☐
Airdrop Lake/Hoodoo Mountain Archaeological Sites	☐
Alsek/Kaskawulsh Area	☐
Cottonwood Trail	☐
Sheep Bullion Plateau	☐
Slims River Valley	☐

Ivvaik

Firth River	☐
Coastal Plain	☐

Tuktut Nogait

Cache Lake	☐

Aulavik

Nasogaluak	☐
Head Hill	☐
McClure's Cache	☐

Ukkusiksalik

Hudson Bay Company Site	☐

Auyuittuq

Maktak Fiord	☐
Northern Fiords	☐
Owl River	☐
June Valley	☐

Sirmilik

Cape Hay Area	☐
South Bylot Island	☐
Goose Camp Valley	☐

Quttinirpaaq

Lake Hazen Basin	☐
Fort Congor	☐
Lewis Lake	☐
Kettle Lake and Muskox Wall	☐

Note: Site specific mitigation as described above are to be attached as conditions of the business licence under; *Business Licence Schedule A) Section 3) "Environmental Stewardship"*. Activities will not be allowed in any areas not identified above. This stipulation will be attached as a condition of the business licence under: *Business Licence Schedule A) Section 2) "Locations"*.

The following sections will be completed by Parks Canada

Section 4 – Additional Environmental Effects

This section identifies activities and environmental effects that may not be addressed through the application of standard mitigation measures identified in Section 3.

A) Based on the information provided in the Business Licence application as submitted by the proponent, identify any potential additional environmental effects related to the proposed project, that may not be addressed through the application of standard activity-specific or site-specific mitigation.

Describe potential environmental issues or effects. Attach additional information as required. Enter NA if not applicable.
1.
2.
3.

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

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

C) Identify any additional mitigation measures required to address additional environmental effects as described under A). Attach additional information as required.

Additional Impact 1	
Mitigation measures	

Additional Impact 2	
Mitigation measures	
Additional Impact 3	
Mitigation measures	

Note: Additional mitigation measures as described above are to be attached as conditions of the business licence under;
Business Licence Schedule A) Section 3) "Environmental Stewardship".

D) Indicate the likely significance of any residual adverse environmental effects following mitigation (based on the following criteria: magnitude, geographic extent, duration, frequency of occurrence, and permanence):

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

Note: If adverse environmental effects are rated as considerable,
DO NOT proceed with the Class Screening.
Contact Parks Canada Environmental Assessment Specialist
for information about environmental assessment requirements.

Section 5 – Cumulative Effects Assessment

5.2 Cumulative Effects Evaluation

A) In consideration of:

- The nature of the proposed operation (e.g., type of activity, intensity of use);
- Areas of vulnerability affected by the proposed operation as indicated in Section 5.1, and;
- Information and direction provided in park management plans, state of the parks reports and other monitoring information;

Is the proposed operation likely to result in adverse environmental effects to any of the following cumulative effects indicators as identified in the Model Class Screening Report? (Consider spatial and temporal overlap of activities, additive or repetitive impacts, synergistic effects)

Indicator	**Yes**	**No**
Increase in human-wildlife interactions that may lead to habituation or human injury		
Increase in human caused displacement of wildlife from prime food sources		
Decrease in wildlife habitat effectiveness		
Disruption of wildlife during sensitive seasons including nesting, denning, rearing or breeding seasons		
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.		
Decrease native fish populations		
Introduction or spread of new non-native species that are a particular threat		
Introduction or spread of new fish diseases that are a particular threat		
Increase accumulation of contaminants that could decrease water quality		
Regular or repetitive use of cultural resource sites		
Impacts to the integrity or context of cultural resources		
Increased conflicts between user groups		

Indicator	Yes	No
Decrease in visitor satisfaction		
Decrease Aboriginal land use experience		
Decrease Aboriginal land use harvest success rate		

B) If checking "yes" to any indicators in A), describe the specific contribution of the proposed operation to adverse cumulative environmental effects and outline mitigation measures as appropriate. Attach any additional information as required.

Contribution	
Mitigation measures	
Contribution	
Mitigation measures	

Note: Additional mitigation measures as described above are to be attached as conditions of the business licence under;
Business Licence Schedule A) Section 3) "Environmental Stewardship".

C) Indicate the likely significance of any residual adverse environmental effects following mitigation (based on the following criteria: magnitude, geographic extent, duration, frequency of occurrence, and permanence):

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

Note: If adverse environmental effects are rated as considerable,
DO NOT proceed with the Class Screening.
Contact Parks Canada Environmental Assessment Specialist
for information about 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 ___

Note: If answering yes, additional environmental assessment work or permitting under SARA may be required

Contact Parks Canada Environmental Assessment Specialist
before finalizing the Class Screening Project Report.

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.

☐ The effects of the proposed licenced activities are not adequately addressed by the CSPR process and therefore an individual environmental assessment is required.

_____ _____

Applicant Date

_____ _____

Environmental Assessment Reviewer Date

_____ _____

Field Unit Superintendent Date

Appendix 2:

Activity-Specific and Site-Specific Mitigation Summary

General Mitigation for All Activities

In addition to the measures outlined below, 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. Business operators and guides are expected to follow other laws and regulations as applicable (i.e. boat 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.

Vegetation and Soil

- As part of a pre-trip briefing, operators and guides shall ensure that all clients are aware of national park regulations on picking or removing vegetation. Clients should be briefed on travel procedures including potential impacts to vegetation and soils prior to departure. Clients should be warned not to eat any edible plants or berries.
- Guides should request that clients check for and remove any bur-like seedpods or mud from boots, clothing and pets and dispose in garbage containers prior to departure 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 gaiters 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.
- Do not make markers, cairns or inukshuks; never blaze trees or otherwise damage vegetation to mark a route.
- Use hiking poles as pointers, binoculars, 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.
- Portable stoves, hibachis, or barbeques should be set up on durable, heat resistant surfaces and away from vegetation or litter wherever possible.

Wherever feasible commercial guides and operators are expected to limit their activities to designated trails, rest stops and other established facilities. 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, sand, and gravel stream bottoms. 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. When you must walk on vegetation use the following guidelines to choose the most resistant and resilient vegetation type. Choose dry vegetation and soils that are more durable than wet vegetation or soils. North of the treeline, avoid vegetated and soft soil areas, particularly grass-sedge meadows, which are critical feeding habitat for wildlife and are easily damaged by foot traffic. In steep terrain travel on rock outcrops or snow. Avoid soil-covered surfaces. When descending loose scree, move slowly and cautiously minimizing the movement of scree and the erosion.
- Guides should use discretion in the management of group travel and select the appropriate technique depending on the circumstances. If an informal trail or route is visible, ensure the whole group follows this trail. Also, in circumstances where travel is on durable surfaces it may be preferable to concentrate the group in one area or along one route. When traveling through areas of undisturbed vegetation (no informal trail or route is visible) groups should spread out laterally to avoid repeated trampling and the creation of informal paths.
- 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.
- Fires are not permitted except in Kluane, see Kluane mitigation for fires.

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. Clients must also be aware that the removal of bones or caribou antlers is prohibited in national parks.
- More specific guidance for dealing with bears in Kluane is found in the brochure “You are in Bear Country” found at on the Kluane internet site (http://parkscan.harbour.com/kluane/pdfs/klbear.pdf) and polar bears in Nunavut “Safety in Polar Bear Country” brochure.

- 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 30 metres from large wildlife species.
- Keep the animal's line of travel or escape route clear. If it approaches you, move away. Foxes and wolves can carry rabies. Do not allow them to approach you. Be especially suspicious if wildlife appears "friendly" or "tame".
- Retreat immediately if you notice signs of aggression or any behaviour change. Avoid direct eye contact. Animals feel threatened by this. Muskoxen have been known to charge and gore people when they felt threatened. Keep your distance.
- Guides shall maintain a distance of at least 300 metres from known wildlife den sites, calving areas and nest sites. Minimise close contact with nesting birds or young animals.
- Watch for bird nests and chicks so as not to step on them; many arctic birds are ground nesters. Section 6(a) of the *Migratory Birds Regulations* states that no one shall disturb or destroy nests or eggs of migratory birds.
- 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 buried or otherwise disposed of in the backcountry. Garbage shall not be burned in any park other than Kluane.
- Minimize food smells, particularly from leftovers, by triple bagging them, placing in air tight containers or eating them.
- 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 2002c)

Aquatic Resources

Operators and guides should be aware that riparian areas are often susceptible to damage through trampling due to wet soil conditions. 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. All water should be should be considered potentially contaminated and should be boiled, or filtered and treated chemically to eliminate water-borne pathogens.
- 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 (do not construct temporary bridges) 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 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.
- Minimize use of soap and use biodegradable soaps for dishwashing and bathing when soap is necessary.
- Bathe or wash away from water sources (50 m) 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. Residual soap should not be dumped in lakes or streams.
- Dispose of gray water by screening and/or removing all food particles, then dispersing (Auyuittuq shallow sump hole) 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. Refueling of camp stoves should occur 100 m from the high water mark of any water body, and an absorbent cloth should be used to catch minor spills.
- 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. Cigarette butts, candy wrappers and twist ties must also be packed out.
- Minimize the amount of food, cans, bottles and tin foil taken into the park to reduce litter.
- On your way out – when your pack is lighter – try to pick up any litter left by others. Report any large accumulations or large items, such as empty fuel drums, to park staff.

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 or vandalize the sites.

- Guides are responsible to ensure that clients do not deface or write on rocks, outcrops, trees, logs or park infrastructure.
- 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.
- Do not remove or disturb any rocks from any features that look – even remotely – like an archaeological site. These sites include cairns, tent rings, fox traps and food caches and are almost indiscernible to the untrained eye.

Aboriginal Land Use

Mitigation for protecting cultural resources, vegetation and soil will protect culturally important areas as well. Additional mitigation could be identified in site specific mitigation.

- Guides will inform clients about the right of Aboriginal people to participate in harvest for subsistence and the cooperative arrangements in place to ensure this harvest is sustainable.
- No interference with traditional activities is permitted.
- Visitors will not approach aboriginal camps unless invited by the members.

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.
- Do not build cairns, other markers, or leave messages in the dirt.

Vehicle use can negatively affect the visitor experience:

- Multiple groups should try to share air or boat access where appropriate.

Mitigation for Mountaineering

Vegetation and Soil

- 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.
- If garbage is burnt, carry out all remaining material including foil and ash.

Visitor Experience

- 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. Do not leave fixed line, glacier wands, food caches or broken equipment in the icefields.
- 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.

Mitigation for Overnight

Vegetation and Soil

- Operators and guides should make use of existing designated campgrounds and tent pads where possible, appropriate and available.
- Select campsites in durable locations where signs of occupation will be minimal, especially for base camps. Disperse tents, avoid repetitive traffic routes and concentrate kitchen and tarp sites where possible on rock, sand or gravel or naturally unvegetated sites. Avoid vegetated areas.
- Do not dig trenches around tents or build rock wind breaks.
- Do not remove any rocks from any features that look – even remotely – like an archeological site, for example, tent rings, fox traps and food caches.
- If rocks are used to secure tents, return them to their original position and location.
- Wear soft shoes around camp to minimize the impact around the campsite.
- 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.
- Do not “clean” sites of organic litter. Renaturalize campsites and rest stops when leaving 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.
- Before leaving ensure the site is as clean or cleaner than it was found.

Wildlife

- Cooking, eating and supply areas shall be set up at least 100 metres downwind from tenting areas. Designated backcountry campsites may already be arranged this way.
- All food, including garbage, canned food, scented and flavoured toiletries (minimize the amount of them you bring in), used toilet paper and toiletries, pet food and livestock feed, should be stored in one of the following methods, depending on the location:
    - In special caches provided
    - If trees are present, hung between two trees at least 4 metres above the ground and 1 metre from the tree trunk, or stored securely.
    - Cliffs or big boulders may have storage sites that a bear cannot access.
    - In a waterproof package and sunk in the water.
    - If necessary, the airtight food package can be left on the ground in an open area away from tents.

- Ensure that food caches left unattended are secure from scavenging wildlife. For example in the parks in Nunavut ravens, weasels, foxes, and wolves can steal food and packs.
- Dispose of dishwater in designated areas, or broadcast at least 100 metres from your sleeping area.
- Campsites should be at least 200 feet from water and not near bird nests.

Mitigation for Motorized Boats

Vegetation and Soil

- Avoid producing a wake that disturbs the shoreline and can cause erosion. Approach inshore areas at slow speeds to minimize disturbances to banks, shorelines and shallow water habitat.
- To avoid the introduction of exotic species, always clean the hull and propeller of a boat before transferring it from another body of water. Clean and inspect the boat trailer as well. Remove all dangling or attached pieces of vegetation.

Aquatic Resources

To avoid the introduction of exotic species, always clean the hull and propeller of a boat before transferring it from another body of water. Clean and inspect the boat trailer as well. Empty the bilge and live well as tiny invertebrates and larval organisms can survive and be transferred in the water. It is best to clean boats and empty bilge water and live wells immediately after exiting a water body. If that has not been done, ensure that cleaning and emptying of water is done well away from any other water body.

Avoid using cleaners that contain phosphates and other toxic cleansers.
Note: In Canada, manufacturers do not have to substantiate such claims as "non polluting" and "fully biodegradable." Remember that all detergents — even those that call themselves

"environment friendly" or "green" — contain polluting phosphates and nitrates. The "Environmental Choice" logo indicates a degree of acceptability (DFO 1998).

Avoid passing over shallow spawning habitat where propeller wash may disrupt habitat and/or smother eggs and larval fish.

Safe fuelling suggestions:

- When fuelling a boat, use extra caution and avoid any spills. Raw fuel is extremely harmful to the marine environment.
- Be prepared to deal with any spill quickly and effectively.
- Have a cloth at hand to catch any spills. Use one for the filler and one for the fuel tank vent. Pay attention!
- If you have portable fuel tanks, never fill them on board. Take them ashore where spills are less likely to occur. Fire regulations require that you fill portable fuel tanks off the boat.
- If you have engine-mounted tanks, it is best to take the motor ashore to refuel. Use a funnel and have an absorbent cloth at hand.
- If you have fixed or built-in tanks:
    - know the capacity of your fuel tank.
    - have an accurate fuel gauge.
    - determine how much fuel you need.
    - do not overfill. Excess fuel can escape through the vent line when the fuel expands as it warms, or when the waves are rough.
    - while you are filling the tank, use your hand to check for air escaping from the vent. When the tank is nearly full, you will feel a distinct increase in air flow. That is the signal to stop filling.
    - install an anti-surge valve in the fuel vent line to prevent fuel from leaking overboard.

If available, use an electric motor when trolling.

Seals, Walrus and Seabirds Mitigation

- Vessel behaviour should be based on the most sensitive or easily disturbed species on site (which may not be the species that is sought for viewing)
- Approach at an indirect angle that provides the maximum visibility for the animals or birds
- Move closer gradually
- Monitor behaviour on approach. Watch for signs of agitation and increase your angle *away* from the animals or birds if they become visibly agitated.
- Slow down to 5 knots (*no wake speed*) at 250 m
- Do not approach head on
- Avoid loud noises
- Avoid rapid movements
- Avoid sneaking up to animals
- Use radio communication with others on-scene to assess the situation
- Avoid circling islands or traveling close to shore at close distances
- Kayakers should avoid hugging the shore

- Use binoculars, instead of your vessel, to bring animals into closer view
- Birthing areas are "*no go zones*": remain at least 250 m offshore
- Avoid approaching pinnipeds on cliff areas or areas with steep drops where animals may injure themselves if they flee the area
- Do not approach closer than 100 m "*no go zone"*
- Be aware that this 100 m "*no go zone*" is a minimum distance: a greater distance may be required earlier in the season and/or year round at certain sites
- If stopping to view pinnipeds, avoid rapid movements: stop and depart slowly and keep a steady speed when viewing.
- Do not go ashore
- Up to 3 vessels "*under 5 tons*" or 1 vessel "*over 5 tons*" may be inside the *"close viewing zone*" (100-250 m) at one time
- If an animal approaches the vessel, it is appropriate to observe it at whatever distance the animal chooses
- Depart slowly from the "*no wake zone*" (250 m) and then increase speed gradually

Whales Mitigation

- Approach whales from the side or rear; do not approach whales head on
- Establish layout and movement of other vessels before approaching whales
- Move closer gradually
- Slow down to 7-8 knots 800 m away
- Reduce speed to "*no wake speed*" at 250 m away
- Approach traveling whales from behind or from the side with speed and direction consistent with the behaviour of the whales
- If whales appear to be avoiding the vessel, increase distance between the vessel and whale
- Don't chase whales
- Vessels should be positioned only on one side of the whales; whales should not be circled
- Positioning vessels ahead of whales and waiting for the whales to pass is not to be used
- Avoid crossing ahead of traveling whales
- If crossing ahead of whales is unavoidable, there should be 800 m clearance
- Do not approach closer than 100 m "*no go zone*"
- Up to 3 vessels "*under 5 tons*" or 1 vessel "*over 5 tons*" may be inside the "*close viewing zone*" at one time
- Do not get between a mother and calf
- To avoid startling whales, paddlers should make some sort of regular, repetitive, low volume noise (like tapping floor of vessel) when inside the "*close viewing zone*"
- Avoid sudden alteration of vessel speed
- Avoid sudden alteration of vessel direction
- Avoid sudden alteration of vessel angle
- If a whale approaches the vessel, stop until it moves away at least 50-100 m
- Response and needs may be different for transient and resident killer whales. There is a greater potential to impact transients with noise: keep noise low
- Depart slowly until beyond "*no wake zone*" (250 m) and then increase speed gradually

Visitor Experience

- Guides must respect other park visitors and use the boat for travel to and from destinations, not for joy-riding.

Mitigation for Horse Trips

Vegetation and Soil

- 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.
- Picketing of horse is not permitted. Free roaming graze method must be utilized to lessen impact.
- Tying of horses to trees is not permitted, however, rope hitching rail systems may be used by tying a rope between two trees and hitching the horse or horses to the rope. This measure is required to stop root damage to trees.
- 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.
- Construction of log or rope corrals is not permitted.

Visitor Experience

- Horse manure must be removed from the campsite area and distributed in the surrounding area.
- Report any horses that died to the warden service.
- Horse use is only permitted in certain areas, please check with Parks Canada.

Horses

- Guides should ensure that groups on horseback use Parks Canada authorized bridges wherever possible to minimise damage to stream banks at water crossings.
- When crossing a watercourse, banks should be approached at a 90^{o} angle whenever possible to minimized disturbance and prevent possible erosion.
- When crossing a watercourse, choose stable terrain and the shallowest sloping location of the bank in order to minimize damage to the bank that can cause erosion.
- When watering, do not allow horses to concentrate in one area as this could result in damage to riparian vegetation, stream banks, and streambed habitat.
- Horses should not be allowed to wade in areas of fish spawning habitat.
- Horse feces deposited in or near a body of water should be removed and disposed of at a minimum distance of 100m from the high water mark of any watercourse.

Mitigation for Dog-Sledding

Vegetation and Soil

- Dogs are not allowed to run free around camp. They must be in their harnesses or picketed. They must not be tied to trees, but to self carried anchors or to a rope that is stretched between two trees. Trees must not be limbed to make beds.

Wildlife

- All dogs must be on leashes or fixed lines at all times. No dogs are allowed to run free.
- While in the park and a few days prior to entering the park, dogs should only be fed commercial dog food. If dogs never eat commercial food, traditional food is acceptable.
- Storing and management of dog food should follow the same mitigations as for human food.

Aquatic Resources

- Provide Parks Canada with records (with dates) of your de-worming program and vaccinations (for at least distemper, parvo and rabies) signed by a practicing veterinarian.
- Stop dogs to defecate in the same location each trip. Clean up and transport out of park on a regular basis
- Clean-up feces at the trailhead and on the trail on a regular basis as agreed to by Parks Canada.
- To help control the spread of giardia virus in the park all dogs must be tied at least 100 m. from any water body. Dog scats that are on frozen water surfaces should be picked up and moved at least 100 m from the shoreline.

Mitigation for Over Snow Vehicles

Vegetation and Soil

- Where over-snow vehicle trails exist from previous trips, use the same trails.
- Avoid vegetation as much as possible.

- Ensure the depth of snow is adequate to prevent damage to vegetation riding over.

Wildlife

- Operators shall educate clients on the potential impacts of winter recreation and on minimum impact practices as applied to winter activities.
- Guides shall minimise the number of individual snowshoe or ski or over-snow vehicle 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.

Aquatic Resources

- Use of frozen water bodies is encouraged to limit the amount of damage done to vegetation. Climbing riverbanks for shortcutting oxbows, etc. should be minimized to protect against erosion.
- When crossing riverbanks, select locations where snow cover is thick enough to buffer the bank from the effects of treads.
- When crossing watercourses banks should be approached at a 90^{o} angle whenever possible to minimize disturbance to underlying soils and vegetation and prevent possible bank erosion.
- When crossing a watercourse, choose the shallowest sloping location of the bank in order to reduce the impacts of treads on underlying soil and vegetation which can result in bank erosion.
- Ensure there is adequate ice thickness to support the weight of the machine prior to crossing watercourses. Do not cross streambeds near areas where water is open.
- Ensure vehicle is well maintained and tuned.
- Install proper jets for the elevation the vehicle will be operating at and adjust the clutch accordingly to reduce emissions.
- Do not use after-market performance “pipes”.
- Use biodegradable synthetic low-particulate lube oil.
- When purchasing new machines, consider more environmentally friendly models.
- Fuel should be kept in sealed containers and appropriate nozzles/funnels should be used during refueling. Refueling should take place 300m away from rivers, lakes or ponds. Absorbent cloths should be used to catch minor spills.

Mitigation for Winter Activities

Wildlife

- Operators shall educate clients on the potential impacts of winter recreation and on minimum impact practices as applied to winter activities.
- Guides shall minimise the number of individual snowshoe or ski or over-snow vehicle 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.

Mitigation for Fishing

Wildlife

- Dispose of entrails properly to reduce the risk of attracting bears and creating a safety hazard for visitors (Parks Canada 2002d). Use fish cleaning and disposal facilities where provided. In backcountry areas where bear-proof garbage bins are not accessible, dispose of entrails by puncturing the swim bladder (this allows entrails to sink) and deposit into deep water, using a boat if available (Parks Canada 2002d).
- Always clean your catch well away (300 m) from campsites, picnic sites, docks or other facilities.

Aquatic Resources

A National Park fishing licence must be purchased and Park fishing regulations must be followed. The regulations include guidelines for catch-and-release practices (Claggett 2002) which include:

1. **Don't play fish to exhaustion.** Instead, use a landing net to bring fish under control before they're played out.
2. **Wet your hands when handling fish.** Dry hands and gloves will remove the protective mucous coating and scales.
3. **Handle fish in the net.** Grasp them across the back and head for firm but gentle control.
4. **Turn fish belly up while removing hooks.** This disorients fish momentarily for easier, quicker handling.
5. **Don't remove swallowed hooks.** Just cut the line next to the fish's mouth.
6. **Don't keep fish out of the water more than 10-15 seconds.** Fragile gills are damaged after that, especially in cold weather.
7. **Revive the fish before releasing (The Catch and Release Foundation 2001).** Hold it under the belly and by the tail, keep it in an upright position underwater. If you are fishing in a river or stream, hold the fish facing the current. Be patient and give the fish as much time as it needs to recover and swim away on its own.
8. **Bring a fish up slowly from depths 30 feet or greater (The Catch and Release Foundation 2001).** This can allow the fish to decompress and increase survival chances. Pause while reeling the fish in and allow the air or gas from the fishes swim bladder to rise to the surface.
9. **Don't cull fish.** Decide quickly whether to keep the fish or not. Do not retain fish on stringers or in live wells, only to be set free when a larger fish is caught. This practice results in an increased mortality of released fish.

- Guides must educate clients about the importance of non-sport fish to prevent the destruction of these species when they are accidentally caught (Mayhood 1992).

- Avoid wading in rivers, creeks or steams when fish are spawning in that particular area. This requires knowledge of species diversity in the different streams, rivers and creeks as well as their biology.
- Retrieve as many snagged hooks and lines as possible.
- Always rinse all mud and debris from all waders and gear that will enter the water to avoid introducing exotic species. If waders or equipment is known to come from an area heavily affected by whirling disease, disinfect the equipment with bleach (1 part chlorine to 9 parts water for 10 minutes), rinse and let dry in the shade (The Whirling Disease Foundation).
- Fish entrails should be sunk in the middle of the lake after puncturing the swim bladder or packed out.

Mitigation for Non-Motorized Boating

Seals, Walrus and Seabirds Mitigation

- Vessel behaviour should be based on the most sensitive or easily disturbed species on site (which may not be the species that is sought for viewing)
- Approach at an indirect angle that provides the maximum visibility for the animals or birds
- Move closer gradually
- Monitor behaviour on approach. Watch for signs of agitation and increase your angle *away* from the animals or birds if they become visibly agitated.
- Slow down to 5 knots (*no wake speed*) at 250 m
- Do not approach head on
- Avoid loud noises
- Avoid rapid movements
- Avoid sneaking up to animals
- Use radio communication with others on-scene to assess the situation
- Avoid circling islands or traveling close to shore at close distances
- Kayakers should avoid hugging the shore
- Use binoculars, instead of your vessel, to bring animals into closer view
- Birthing areas are "*no go zones*": remain at least 250 m offshore
- Avoid approaching pinnipeds on cliff areas or areas with steep drops where animals may injure themselves if they flee the area
- Do not approach closer than 100 m "*no go zone"*
- Be aware that this 100 m "*no go zone*" is a minimum distance: a greater distance may be required earlier in the season and/or year round at certain sites
- If stopping to view pinnipeds, avoid rapid movements: stop and depart slowly and keep a steady speed when viewing.
- Do not go ashore
- Up to 3 vessels "*under 5 tons*" or 1 vessel "*over 5 tons*" may be inside the *"close viewing zone*" (100-250 m) at one time
- If an animal approaches the vessel, it is appropriate to observe it at whatever distance the animal chooses
- Depart slowly from the "*no wake zone*" (250 m) and then increase speed gradually

Whales Mitigation

- Approach whales from the side or rear; do not approach whales head on
- Establish layout and movement of other vessels before approaching whales
- Move closer gradually
- Slow down to 7-8 knots 800 m away
- Reduce speed to "*no wake speed*" at 250 m away
- Approach traveling whales from behind or from the side with speed and direction consistent with the behaviour of the whales
- If whales appear to be avoiding the vessel, increase distance between the vessel and whale
- Don't chase whales
- Vessels should be positioned only on one side of the whales; whales should not be circled
- Positioning vessels ahead of whales and waiting for the whales to pass is not to be used
- Avoid crossing ahead of traveling whales
- If crossing ahead of whales is unavoidable, there should be 800 m clearance
- Do not approach closer than 100 m "*no go zone*"
- Up to 3 vessels "*under 5 tons*" or 1 vessel "*over 5 tons*" may be inside the "*close viewing zone*" at one time
- Do not get between a mother and calf
- To avoid startling whales, paddlers should make some sort of regular, repetitive, low volume noise (like tapping floor of vessel) when inside the "*close viewing zone*"
- Avoid sudden alteration of vessel speed
- Avoid sudden alteration of vessel direction
- Avoid sudden alteration of vessel angle
- If a whale approaches the vessel, stop until it moves away at least 50-100 m
- Response and needs may be different for transient and resident killer whales. There is a greater potential to impact transients with noise: keep noise low
- Depart slowly until beyond "*no wake zone*" (250 m) and then increase speed gradually

Site Specific Mitigation

Aulavik

Management of human waste

Operators should use the following mitigation to avoid visual and aesthetic impacts as well as to protect water sources from contamination. As appropriate, encourage passengers to following these mitigation measures as well.

- Encourage clients to use washrooms before boarding the aircraft.
- Urine in healthy people is sterile. Urinate 50 meters away from the aircraft landing site, travel routes, camping areas and water bodies.
- Select a level site well away from any water sources.
- Dig a small hole within the active layer of the soil. If possible, choose an organic area.
- Burn the toilet paper before carefully burying what remains.

Glaciers

- Pack out, concentrate urine in one area on the periphery of camp, cover stains with snow if possible
- To lessen the chance of contamination, especially in more popular areas, human feces should be buried as deep as possible in pit privies or deposited into crevasses

Snow

Guides shall ensure that groups move well off main trail or landing area 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.

Snowmobile Guides in Aulavik must:

- Belong to an Inuvialuit firm
- Provide detailed route descriptions which avoid impacts to important Park cultural and natural resources
- Apply for an over-snow vehicle permit for each trip into the Park
- Not engage in traditional harvest activities
- Travel only during times that will have the least effect upon wildlife populations
- Demonstrate that the trip would offer a reasonable visitor experience in keeping with national park values

Cultural Sites

- Guides should be familiar with, and avoid areas of cultural significance identified below. Guides should be aware that there is local community concern over visitation of gravesites. Guides should respect these concerns and practice voluntary avoidance of gravesites.
- Guides should leave in place and report locations of found artifacts.
- Guides are encouraged to include cultural interpretation of Park resources and are advised to work with PC to locate cultural sites which are less sensitive to disturbance for this purpose. PC will provide background information and assist with developing interpretive materials.

Head Hill Site 130X88

The site consists of a series of muskox kill sites and dwelling remains on the crest of a hill on the north side of the Muskox River, west of its confluence with the Thomsen River. The remains of an estimated 800-1000 muskoxen, including 561 skulls are at the site, which stretches about 350m on a north-south axis along the hillcrest. The site may have been occupied from A.D. 1600-1771 during the "Intermediate Interval" which is a transitional period between Thule and Copper Inuit and by the Copper Inuit from A.D. 1851-1890.

Nasogaluak Site 130X4

The site is located on the western and southern edges of a high terrace or bluff overlooking the Thomsen River and valley. The valley is broad with little topographic variation and the river meanders across a wide and often sandy floodplain. The site features, consisting primarily of caches (about 40), are discontinuously spread over a large area measuring 20,000 sq. m. Copper Inuit were the likely inhabitants of the site, within a time period between A.D. 1851-1890.

HMS Investigator Cache Site (M'Clure's Cache Site) 130X107
The site is located on Providence Point Peninsula, about 2km south of Providence Point, along the western shore of Mercy Bay. The site consists of three clusters of debris, abandoned by Robert M'Clure and his crew of the Investigator (1851-1853). This site is a focal point of Inuvialuit travel and collection routes for Banks Island.

Burials
Isachsen Sands 130X59
This site is about 20km south of the Head Hill Site, on the northwest bank of the Thomsen River. Three tool caches believed to be burial caches are located away from the tent rings and meat caches of the main habitation area of the site.

130X14 (Possible Burial)
The site is located on the west side of the Thomsen River on a stony, well-drained terrace about 4m above the river and 10m west of the water's edge. A boat-shaped arrangement of stones is considered to be a possible grave.

130X34 (Possible Burial)
The site is on the west side of the Thomsen River on a low ridge in an area dominated by large, thin stone slabs. This extensive site consists of about 80 slab caches, a few dismantled tent rings and a possible grave formed of slabs.

130X38 (Probable Burial)
The site is spread along the east edge of a gravely terrace about 20m above and 25m south of a seasonal creek that flows north to the Thomsen River. Two probable graves were recorded consisting of small and large cobbles in approximately parallel lines.

130X111 (Possible Burial)
The site is on the crest of a low hill paralleling a small seasonal stream to the north, draining into a creek on the west side of the site. A possible grave measures 1.5m x 2.5m, is roughly oval in shape and consists of small cobbles. No artifacts or bones are associated with the feature.

130X126 (Possible Burial)
A possible grave 3.2m x 1.2m in size, covered by heavy vegetation is recorded 750m west of the Thomsen River. No associated artifacts or bone is present.

130X153 (Possible Burial)
A tent ring, cache and possible grave are located approximately 350m west of the Thomsen River. The grave is rectangular, measures 2.8m x 1.3m and is covered by considerable vegetation.

130X171 (Probable Burial)
The site is located on the east side of the Thomsen River on a terrace/spur 30m above the river, offering a commanding view of the river valley. The feature is ovoid in shape measuring 3.0m x 2.3m with numerous small, flat stones covering a 1.6m x 1.0m area composing the probable grave. Approximately 18 possible human bones and several artifacts are associated with the feature.

130X209 (Possible Burial)
Located on the west side of the Thomsen River, north of an unnamed stream and about 7.2km northwest of Dissection Creek. The possible grave consists of 17 small rocks and measures 1.8m x 1.1m and appears to be untouched. No associated artifacts or bone was observed.

130X213 (Possible Burial)
The site is located about 400m west of the Thomsen River, near site 130X29. The possible grave is rectangular shaped, its long axis oriented north-south. It is noted as being an appropriate size and shape for a grave.

130X218 (Possible Burial)
The site is on the west side of the Thomsen River, on the edge of a grassy hill near the head of the outside bend of a large meander in the river, across the river from "Trout Beach". The possible grave, measuring 2.7m x 2.3m, is made of large and small boulders. Three caches are also present at the site, but no artifacts or faunal material is associated with the features.

130X229 (Possible Burial)
A possible grave situated on a small knoll on the north bank of the Muskox River, a short distance from the Thomsen River and about 20km north of Isachsen Sands. The feature is formed of flat rocks and cobbles covering a 1.0m x 2.5m area. A number of artifacts and bone are associated.

Auyuittuq

Management of human waste

Operators should use the following mitigation to avoid visual and aesthetic impacts as well as to protect water sources from contamination. As appropriate, encourage passengers to following these mitigation measures as well.

- Encourage clients to use washrooms before boarding the aircraft.
- Urine in healthy people is sterile. Urinate 50 meters away from the aircraft landing site, travel routes, camping areas and water bodies.
- If near the emergency shelters, use the outhouses at those locations for feces. A separate container is located in the outhouse for toilet paper.
- Those visitors who use "Depends", tampons or other sanitary products must also plan for their disposal. Please bring along enough plastic ziplock bags to pack these items out- the same as you pack out all your food garbage. A little powdered bleach in the baggies can reduce the smell. Sanitary items cannot be dealt with in the same manner as toilet paper and should not be left behind at the outhouses with feces or toilet paper.
- Canisters for the safe holding and transport of human waste will soon be available for backcountry groups in Auyuittuq National Park.

Winter

- Please also urinate outside the outhouse, away from watercourses. Urine is sterile in healthy people; keeping it out of outhouses reduces our costs of transporting waste out of the park.

Glaciers

- Pack out, concentrate urine in one area on the periphery of camp, cover stains with snow if possible
- To lessen the chance of contamination, especially in more popular areas, human feces should be buried as deep as possible in pit privies or deposited into crevasses

Snow

Guides shall ensure that groups move well off main trail or landing area 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.

Cultural Sites

- Guides should be familiar with, and avoid areas of cultural significance identified below. Guides should be aware that there is local community concern over visitation of gravesites. Guides should respect these concerns and practice voluntary avoidance of gravesites.
- Guides should leave in place and report locations of found artifacts.
- Guides are encouraged to include cultural interpretation of Park resources and are advised to work with PC to locate cultural sites which are less sensitive to disturbance for this purpose. PC will provide background information and assist with developing interpretive materials.
- Require permission in business license to operate in Zone 1 areas.

Zone I: 205X6

This site is on a small bedrock peninsula on the north shore of Maktak Fiord near the mouth of Coronation Fiord, 1m-80m from the sea. The site consists of 18 or more caches, four stone house structures, five tent rings, four kayak stands and a fox trap. A Middle to Late Thule (A.D. 1000-1600) cultural affiliation is suggested for the site. A monitoring system has been established to assess soils, vegetation, and any changes in the cultural features.

205X17

This site is about 7.5km east of the head of Maktak Fiord on the north shore. A rivulet runs down the mountain east of the site. Two tent rings and a temporary shelter comprise the site. The shelter, measuring 2.85m long x 1.8m wide x 1.5m high, uses a natural rock outcrop with the front and back walls constructed of three layers of rocks. The area is significant as local elders state that taraituk or ghosts/spirits are present.

Burials

205X93

The 1953 burial of Dr. Ben Battle, a scientist who was a member of one of the first scientific expeditions into the area is reported to be at the foot of Mount Battle, on the southeast side of Glacier Lake (Elliot 1972:76).

205X94

Five graves are located on the north side of North Pangnirtung Fiord near the mouth of the fiord, in the vicinity of emergency shelter #12. Five families living in the area moved out in the late

1950s and the graves likely relate to them. Two adult women are buried in wooden coffins 133m apart. Three infant graves are in a nearby group.

Maktak Fiord – Cultural Resources
Permission in business license conditions is required to operate in Zone 1 areas. Guides must accompany visitors. Cultural resources are not to be disturbed, moved, or collected.

All Northern Fiords
Polar bear habitat / denning sites. Use particular caution in these areas, report all polar bear sightings and observations of bear sign to park staff.

Peregrine nesting sites
Avoid nests and report sightings to Park staff.

Owl River and June Valley
Avoid owl denning sites and report sightings to Park staff.

June Valley
Avoid active fox denning areas and report sightings to Park staff.

Other

- Guides are to ensure that data collection sites and equipment are not disturbed.
- All visitors must take part in mandatory orientation in before visiting the park
- In Auyuittuq, emergency shelters are for all to use. They should not to be used as private accommodation or to cook or store food.

Ivvavik

Management of human waste

Operators should use the following mitigation to avoid visual and aesthetic impacts as well as to protect water sources from contamination. As appropriate, encourage passengers to following these mitigation measures as well.

- Encourage clients to use washrooms before boarding the aircraft.
- Urine in healthy people is sterile. Urinate 50 meters away from the aircraft landing site, travel routes, camping areas and water bodies.
- 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.

Glaciers

- Pack out, concentrate urine in one area on the periphery of camp, cover stains with snow if possible

- To lessen the chance of contamination, especially in more popular areas, human feces should be buried as deep as possible in pit privies or deposited into crevasses

Snow

Guides shall ensure that groups move well off main trail or landing area 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.

Cultural Sites

- Guides should be familiar with, and avoid areas of cultural significance identified below. Guides should be aware that there is local community concern over visitation of gravesites. Guides should respect these concerns and practice voluntary avoidance of gravesites. Structures are vulnerable to damage and pose a public safety risk and should be voluntarily avoided as well.
- Guides should leave in place and report locations of found artifacts.
- Guides are encouraged to include cultural interpretation of Park resources and are advised to work with PC to locate cultural sites which are less sensitive to disturbance for this purpose. PC will provide background information and assist with developing interpretive materials.

Clarence Lagoon

30Y96 (Burial)

The single grave is exposed on the edge of an actively eroding bank, just west of the opening to Clarence Lagoon. In 1996, the wooden grave covering was observed to be overgrown with vegetation and sinking into the sod. There are some surface artifacts associated with the grave including fragments of a whalebone kayak keel, sled runner and possible harpoon shaft. The site probably relates to the Western Thule culture (A.D. 1000-1778) and should be monitored carefully for erosion problems and protected from unnecessary visitation.

72Y (Structures)

The site is about 40 m back (south) of the beach ridge and in front of a small pond at the northeast corner of Clarence Lagoon. It consists of two small rectangular sod-embanked cabin foundations measuring 3.1m x 2.6m and 1.7m x 1.6m. The larger cabin has some floor remains, which appear to have been burnt; no visible artifacts are associated with either feature. The site is likely associated with the Inuvialuit culture, dating as far back as A.D. 1778.

74Y Hudson's Bay Company Post

The site is on the east shore of Clarence Lagoon, toward the south end of the lagoon. The site consists of two extant structures, the remains of five other structures and numerous associated surface artifacts.

76Y (Structures and Burials)

The site is located about 3km west of the Hudson Bay Company store, along the south shore of Clarence Lagoon to the immediate east of the most inland portion of the lagoon and west of a small spit and bay. The site concentrates around a small rise, which is about one metre above the surrounding tundra. The site consists of two large, well-defined pole and sod houses and six smaller foundations. There is also an ice house, a burial, and several other features including house annexes, tent sites and middens. The site is considered to have an Inuvialuit (Western

Thule?) A.D.1778 - 1996 cultural affiliation. Numerous other artifacts remain in their original location along the high ridge where the site is centred. The grave consists of east-west oriented driftwood logs in a shallow rectangular depression measuring 1.4m x 2.4m. It is situated on the west side of the knoll. A possible grave is 3.5m southwest and consists of a few east-west oriented logs in a slight depression 1.2m wide.

Catton Point
30Y98 (Structure)
The site is on the west side of a small inlet just west of Catton Point. It is about 200 m inland from the coast and adjacent to the inlet's edge. The main site feature is an intact log house constructed from horizontally laid logs, notched at the corners, with a plank floor and a sod roof. The site is associated with the Historic Inuvialuit A.D. 1778-1987.

83Y (Structures and Burial)
The site is on the shore of a small bay at the southeast tip of Ptarmigan Bay, 400m due east of Catton Point Spit. A small creek runs to the northwest of the site. Two standing houses, a log foundation, a grave, and associated artifacts characterize the site. One structure was not present in 1987, but there is graffiti dating to 1988, mostly documenting summer visitors. There are a large number of historic artifacts associated with this site. The other house was built in about 1944 and has been almost completely dismantled. A Christian burial marked by a cross, is located 187m southwest of his house.

84Y (Structure)
This site is located at the southern tip of Ptarmigan Bay, 300m inland from the shore of MacKenzie Bay, which is also the south end of the Catton Point spit. A log cabin stands near the eroding bank edge.

Qargialuk 85Y (Structures and Burials)
The site is on a large vegetated knoll midway down Catton Point Spit. The spit separates Ptarmigan Bay from MacKenzie Bay. Cultural features are clustered in three distinct areas on the knoll. The focal point of the south cluster of features is a single modern cabin, owned by Danny C. and Annie Gordon. Numerous drying racks, smoke houses and lean-tos are spread out to the south along the spit. Eight graves are present on the north side of Qargialuk, on the northwest side of the hill. All are a traditional, non-Christian style, with a covering of driftwood logs and could date as far back as the Historic Inuvialuit period A.D. 1778. Six have grave goods and bone exposed on the surface. Four driftwood piles, resembling graves, are to the west, near the edge of the bank.

93Y (Burials)
The site is on the coast of the Beaufort Sea, 4.5km due east of the hook at the northern tip of Catton Point Spit. The site is 25m from the edge of the bank on the northeast shore of a small bay west of Ptarmigan Bay. It consists of two large, very intact traditional burials and a smaller, less defined burial. The larger graves are roughly square and retain some evidence of formal structure. Grave goods consisting of carved wood and bone tools are on the surface, but scant human bone. The small burial is deeply buried with no visible artifacts or bone associated with it. A Historic Inuvialuit (A.D. 1778 - 1987) cultural affiliation is suggested for the site.

Roland Bay
88Y (Structure)
This site is located halfway down the east coast, south from the mouth, of Roland Bay. The primary standing structure is a standing log cabin about 2km from the mouth of the bay on its east side. Adjoining to, and wrapping around, the exterior of the west end of the building is a dog house; an enclosed "walkway" with tin flashing around its interior base; and a porch. Other site features include an infilled, cribbed ice house, a wooden walkway running between the cabin and the beach, drying rack, wood pile, wood sled, wood radio tower and other associated artifacts.

Other Sites

Firth River

- Human waste must be packed out
- Camping is only allowed in identified camping areas. A listing of these areas is available in the Park office. Guides will complete a campsite monitoring form for each trip.
- Group departures are separated by at least 2 days.

Coastal Plain
This area is identified in the management plan as a sensitive area for waterfowl (staging, moulting and breeding). Also the Porcupine Caribou herd calve throughout the plain between mid-May and mid-June.

- Operators must not disturb caribou herd during calving period.

Kluane

Kluane general

- Campers should not camp within 100 m of any of the Warden cabins within the park (i.e. cabins at Mush and Bates Lakes, Onion Lake, Sheep Creek, Bighorn Lake & Grizzly Creek).
- Horse use is not allowed in the following areas:
    - St. Elias Lake
    - Auriol Trail
    - Mush-Bates Lakes/Field Creek
    - Mother's/Dezadeash River Trail
    - Sheep Mountain Area
    - Slims River West
    - Sheep/Bullion Plateau
    - Congdon Creek
    - Rock Glacier Trail
    - Burwash Creek (portion within the park boundary)
    - All Zone 1 areas except Mt. Hoge/Donjek Valley, where horse use is allowed.
- All food and other bear attractants (ie garbage) must be carried and stored in the bear resistant containers between April 1 to November 15 in the following areas of Kluane:
    - Slims River Valley and side drainage's
    - All portions of the Cottonwood Trail

- Alsek; Dezadeash and Kaskawulsh river valleys

Persons intending to travel within or through these zones require canisters even if their overnight campsite or final camp location may be outside the area.

- Alsek River Guidelines must be followed when rafting on the Alsek River.

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.
- Operator vehicles shall be in good running order.
- Operators and guides shall minimize idling of vehicles at trailheads and pullouts.

Human Waste Mitigation

Operators should use the following mitigation to avoid visual and aesthetic impacts as well as to protect water sources from contamination. As appropriate, encourage passengers to following these mitigation measures as well.

- Encourage clients to use washrooms before boarding the aircraft.
- Urine in healthy people is sterile. Urinate 50 meters away from the aircraft landing site, travel routes, camping areas and water bodies.
- 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.

Glaciers

- Pack out, concentrate urine in one area on the periphery of camp, cover stains with snow if possible
- To lessen the chance of contamination, especially in more popular areas, human feces should be buried as deep as possible in pit privies or deposited into crevasses

Snow

Guides shall ensure that groups move well off main trail or landing area 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.

Zone 1 Areas

The following Zone 1 Areas were identified in the management plan for special protection. More detailed descriptions can be found in the management plan.

- **Logan Nunatak** – an ecologically unique and sensitive area, special care should be taken to minimize the amount of time in this area and avoid stepping on plants. No camping in the area.
- **Steele Creek Alpine** – a representative area of northern alpine ecosystems, avoid use in the area.

- **Mt. Hoge/Dän Zhür/Donjek Valley** – unique plants and habitat for a large population of Dall's sheep. No grazing or overnight camping with horses in this area.
- **Shär Ndu Chù'/Duke River Headwaters** – habitat for a rare plant, *Braya purpurascens*, only small groups are permitted. Remind clients that picking flowers is not allowed in a national park. Horses are not allowed in this area.
- **Bullion Creek Dunes** – significant features formed by material deposited from glacial winds. Commercial groups are allowed in this area but camping is not recommended on the dunes because of the fragile nature of the soil and vegetation there.
- **Tachäl Dhäl (Sheep Mountain)** – Sensitive because of the aeolian processes, vegetation and Dall's sheep population, it is particularly important in this area to remain on trails and not approach the wildlife. Open fires are not allowed and camping is not allowed until after 48 pup creek.
- **A'äy Chù' (Slims River) Delta** – The Slims River delta is a dynamic system with plants adapted to the periodic disturbance. No additional mitigation is required, however minimize the amount of walking in this area to protect it.
- **Goatherd Mountain** – Representative of the Coastal Alpine Ecosystem, this area is important for mountain goats. Camping is not permitted in an area at the base of the mountain. See Parks Canada for exact locations.
- **Lower Alsek River** – A more productive and different ecosystem is found here, but no additional mitigation is required.
- **Sockeye Lake and River** – Travel in and on and camping within 500 m of the shore of Sockeye Lake and Sockeye River is not allowed between July 15 and October 30 to protect the spawning kokanee salmon and their habitat. Camping is prohibited within the designated area (see Parks Canada for exact locations) between July 15 and October 30.
- **Fraser Creek Fen** – Rare habitat in the park, trumpeter swans nest in the area. No additional mitigation measures are required.
- **Airdrop Lake/Hoodoo Mountain Archaeological Sites** – This site is valued because of the undisturbed ancient obsidian quarry sites. Access is not allowed.
- **Alsek/Kaskawulsh Grizzly Bear Protection Area** – The highest density of grizzlies is found in this area. The Alsek River Regulations/Guidelines must be followed, including the following:
    - Bear resistant food storage canisters must be used in this area.
    - Campfires are permitted only when contained within a fire pan. Camp stoves are recommended as the supply of driftwood or dead wood is limited and maybe difficult to acquire in commonly used campsites. The cutting of live trees is prohibited. When fire pans are cleaned, all ashes must be dumped into the main flow of the river in a manner to ensure that coals and/or ashes do not wash back up on shore in the immediate vicinity of the campground, or create a fire hazard further downstream. All human waste must be carried out of the park.
    - Camping restrictions: The following measures have been implemented to reduce the potential for grizzly bear - river use conflicts within the Alsek Special Preservation Area, and address campground crowding and resource impact concerns. River users are only permitted to camp for **one** night between the Kaskawulsh River and the last bend in the Alsek River before Lowell Lake at LB 370 920. The former camping area around the small creek at the base of Goatherd Mountain has been closed to overnight camping as this campsite was within a

narrow travel corridor frequently used by grizzly bears. Please contact Parks Canada for the specific area being closed to camping. Park visitors are reminded to follow the standard bear safety procedures, and to chose their campsites carefully so as to avoid potential bear habitat.
    - Rafters must not leave their rafts unattended while hiking. At least one person should be left behind to watch the rafts.
    - River users are not permitted to camp a distance greater than 100 metres from the river high water line.
- **Cottonwood Trail** - To minimize the potential for Human /bear interaction and to minimize impacts to bears from visitors hiking the Cottonwood trail, camping between Kathleen Lake and Cottonwood creek is restricted to the following designated camping areas. South of Cottonwood meadows random camping is permitted.
    - Kathleen Lake Campground
    - Lower Victoria Creek (km 67)
    - Cottonwood Meadows
- **Sheep Bullion Plateau -** All overnight camping and travel is restricted within the Sheep-Bullion Plateau area (see Parks Canada for exact location). The purpose of this restriction is to provide a more secure area for grizzly bear family groups who frequent the area by limiting the duration and amount of time people spend on the plateau by camping. By restricting camping in this area the potential for interaction is hopefully reduced.
- **Slims River Valley -** Random camping is permitted only at the following locations to help protect cultural artifacts in the area:
    - Slims West - after Bullion Creek
    - Slims East - 2 km from trail head on Vulcan Creek fan

These restrictions still apply when the gates on the Slims east and west roads are closed (usually at the beginning and end of the season).

Fire

In Kluane, open fires are allowed where random camping is permitted except Slims West from Sheep Mountain to Bullion Creek. And is not recommended in sub-alpine and alpine areas because of the fragile nature of flora. Fire pans are required for all open fires where random camping is permitted along the Alsek River (to reduce visible impacts of campsites), as outlined in the Alsek River Use Guidelines. Furthermore:

- 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.

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

- 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. Carry out remaining portions of garbage that are not fully burnt.

Campfire use can affect the experience of other visitors:

- Only build fires where permitted in Kluane.
- 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.

Cultural Sites

Bullion Creek/Slims River

- The following sites in the Bullion Creek/Slims River area are vulnerable to damage and a concern for public safety. Use extreme caution when near these sites not to damage any artifacts. Do not lean against or lean packs against buildings.

10Y1

The site is on the east side of Bullion Creek, at the mouth of Bullion Creek Canyon, 2.5km north of Slims River. It was constructed in 1904 during the initial period of intense gold mining on Bullion Creek. Seven features were recorded including a log cabin, root cellar, possible cache, lean-to, camp fire, bench seat, and the outline of a three-room foundation.

Bullion City Site 10Y2

This is the largest mining-related site in the area and is located on either side of a dry creek bed 1.5 km east of Bullion Creek on the north side of an old road. Twenty-three features were recorded including a cookhouse, eight tent frames, six platform caches, root cellars, foundations, and a 3-hole privy. The artifacts suggest a date of about 1890-1904. The site is believed to be tent city briefly occupied during the 1904 Bullion Creek gold rush.

10Y3

The site is on the north bank of Bullion Creek, immediately southeast of the steepest canyon on Bullion Creek and 8.5km northwest of Slims River. Site features include two-storey log cabin, outhouse, two piles of sluice or flume boards and portable artifacts. The artifacts suggest a mid-1930s date.

10Y4

The site is on the east bank of Bullion Creek, about 7km northwest of Slims River. The main feature is a log cabin 4m x 5m x 3m high at the peak, built using post-on-sill construction, with logs chinked with moss and burlap. Portable artifacts associated with the cabin suggest a date after 1922.

10Y5
The site is on the north side of an old road approximately 300m east of Site 10Y1 on the east side of Bullion Creek, 2.5 km north of the Slims River-Bullion Creek junction. The site includes a root cellar, corral, picket fence and a large log cabin. Stevenson (1982) suggests its size and location indicate that this was the Bullion City Hotel reported to be under construction in the 14 May 1904 edition of the Daily Evening Star (Whitehorse).

11Y1
The site is west of the mouth of Sheep Creek, 1 km west of the old Alaska Hwy bridge on the Slims River. The site includes two log cabins, privy, garbage dump, rectangular log foundation and many portable artifacts. Artifacts and inscriptions in the buildings suggest the site represents the fine hotel and cabins built at Sheep Camp in May 1904 for the gold rush.

Alsek River

- 16Y2 and 16Y5 sites, described below, are very fragile. Therefore it is recommended that commercial guided groups do not visit these sites.

16Y2
The site is on the steep northwest slope of a beach terrace on the east bank of the Dezadeash River, 100 m north of Beachview Creek. It is about 600m east of the confluence of Beachview Creek with Dezadeash River and northeast of the confluence with the Kaskawulsh River. The site is in the shelter of the ridge bordering the north side of Beachview Creek. The primary site feature is a cabin believed built by Scotty John's father and used by Scotty John.

16Y5
The site, commonly referred to the Park Creek Cabin, is on the west bank of the Alsek River about 0.6km inland, 3.5km north of Lava Creek; 1.4km south of Park Creek and 0.9km northwest of mouth of an unnamed creek, a small island is present in the Alsek River just opposite the site. The site consists of two V-notched log cabins and ancillary structures including what appear to be a log-covered ground cache, a possible dog shelter, and a pile of firewood. The area likely represents a mining site with components dating to the Kluane Gold Rush of the early to mid 1890s, and probably later as well.

Mush and Bates Lake
The site is at the base of a knoll on a terrace on the northwest shore of Mush Lake. A small creek enters the lake west of site. Access is by boat from Government Landing 9km east of site or along trail from Mush Lake Warden cabin, 0.7km southwest of the site. The cabin is about 5m x 5m and appeared to have had a flat roof, consisting of longitudinal ridge poles, with smaller diameter poles laid across them. The cabin was believed to have been erected by an old man during the 1930s and 1940s. Because the hiking trail cuts across the site, portable artifacts and the cabin itself are at risk from visitor activity. Threats include displacement of artifacts, trampling, removal of artifacts as 'souvenirs', use of wooden components as a source of firewood, and vandalism.

- This site is vulnerable to damage and a concern for public safety. Use extreme caution when near this site not to damage any artifacts. Do not lean against or lean packs against buildings.

Cottonwood Trail
Stay on the trail while along the shore of Kathleen Lake as there are cultural sites located near the trail.

Johobo Mine Site 29Y92
The site is on the east side of the Cottonwood Trail at Trail Marker 55.7, at the northeast corner of Johobo Lake, 1.8km east-northeast of the mountain peak east of Johobo Lake and 2.1km northeast of the mountain peak on the west side of Johobo Lake. The copper mine, in operation between 1940 and 1960, consists of building foundations and related mining artifacts. Much of the site has been cleaned up and the building(s) burned, leaving the remains of a large building foundation just east of Trail Marker 55.7, and campsite areas in the bush on the mountainside to the west of the trail marker.

- 29Y92 site is vulnerable to damage and a concern for public safety. Use extreme caution when near this site not to damage any artifacts. Do not lean against or lean packs against buildings.

Beloud Grave 29Y99
The grave is on the north side of Beloud Creek, on the edge of a high knoll overlooking the creek, 0.5km west-southwest upstream of the Beloud-Victoria Creek confluence. The site is most easily accessed via the Cottonwood hiking trail by a narrow gully, clear of brush, approximately 200m northeast of the site. The site is surrounded with low brush and the windswept crest of the knoll has areas of gravel and grass. It slopes very steeply down to Beloud and Victoria Creeks on either side.

- Guides should be aware that there is local community concern over visitation of gravesites. Guides should respect these concerns and practice voluntary avoidance of gravesites.

Kathleen Lake
29Y75
The site is along the trail on a high bank at the end of a prominent south facing point on the north side of Kathleen Lake at the west end of the lake. It is 0.3 km northwest of the Day Use Area boat dock, and approximately 3.5 km southeast of the entrance to Kathleen River. The site has surface recent historic and buried precontact components.

Kathleen Fire Hearth Site 32Y105
The site is on the crest of a former beach ridge, in a gravel driveway approximately 25m west of the boat launch at the Kathleen Lake Day Use Area. It consists of a hearth with mammal bone fragments and fire-cracked rock eroding from a cabin access road where it crosses an abandoned beach ridge. A private cabin is 35m north of the feature on the terrace.

- Use extreme caution when near 29Y75 and 32Y105 sites not to damage any artifacts.

Donjek River
These sites are very fragile. Therefore commercial guided groups are not allowed at these sites.
37Y Bighorn Creek Mouth Site No.1

The site is on the east bank of the Donjek River, north of the mouth of Bighorn Creek. It stretches for approximately 340m along the Donjek River, flanked by gullies at either end, and extends back at least 50m and perhaps as far as 80m from the edge to the present bank. It is a rich multicomponent stratified site perhaps dating as far back as 8000 BP. The site has yielded numerous lithic tools and animal bone, but is severely affected by wind erosion causing bank slumpage & blowouts.

39Y Bighorn Creek Mouth Site No. 2
The site lies on the high point on the north side of Bighorn Creek, which marks its confluence with the Donjek River. This well-stratified multicomponent site covers an area 95m north-south and 73m east-west along the eroding bank edge. Numerous lithic tools and debitage as well as faunal remains have been recovered from the site.

- Sites 37Y and 39Y are very fragile. Therefore it is recommended that commercial guided groups do not visit these sites.

Quttinirpaaq

All visitors must take part in mandatory orientation in before visiting Quttinirpaaq.

Management of human waste

Operators should use the following mitigation to avoid visual and aesthetic impacts as well as to protect water sources from contamination. As appropriate, encourage passengers to following these mitigation measures as well.

- Encourage clients to use washrooms before boarding the aircraft.
- Urine in healthy people is sterile. Urinate 50 meters away from the aircraft landing site, travel routes, camping areas and water bodies.
- Pack it out or bury it under rocks away from trails, campsites and any fresh water source. At the very last resort feces can be deposited under rocks 50 meters from camp sites, travel routes and water bodies. Avoid disturbing plant communities.
- If near a body of *salt water* (i.e. one of the coastal areas of the park) it is acceptable to deposit your feces in a shallow pit below the high water mark.
- Minimize the use of toilet paper. Burn it as completely as possible or pack it out. Tampons should be packed out, in a zip-lock bag, with other garbage.

Glaciers

- Pack out, concentrate urine in one area on the periphery of camp, cover stains with snow if possible
- To lessen the chance of contamination, especially in more popular areas, human feces should be buried as deep as possible in pit privies or deposited into crevasses

Snow
Guides shall ensure that groups move well off main trail or landing area 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.

Cultural Sites

- Guides should be familiar with, and avoid areas of cultural significance identified below. Guides should be aware that there is local community concern over visitation of gravesites. Guides should respect these concerns and practice voluntary avoidance of gravesites.
- Guides should leave in place and report locations of found artifacts.
- Guides are encouraged to include cultural interpretation of Park resources and are advised to work with PC to locate cultural sites which are less sensitive to disturbance for this purpose. PC will provide background information and assist with developing interpretive materials.

Fort Conger 16X

The site, on the northeast shore of Discovery Harbour first served as a wintering site for the Nares Expedition (1875) and Peary used the site several times eventually dismantling Greely's habitation to build the three huts that survive today (1899, 1900-1902). A burial is southeast of the main site, consisting of an oval outline of bricks measuring 2.5m north-south x 1.15m east-west, partly embedded in the ground. There is no record of expedition members being buried at Fort Conger and the burial may pre-date European arrival and was subsequently outlined by expedition members. Numerous other site features and artifacts are present including depressions, pits, 13 tent outlines, brick concentration, barrels, stove parts, portable forge parts and tin cans.

Kettle Lake

50X3

The site is located on a sparsely vegetated gravel terrace(s) at the south end of Kettle Lake in the small valley created by May Creek. The site consists of six caches, three cairns, two fox traps, one tent ring, a platform and two unidentified stone features. The site has been assigned a possible Thule affiliation (A.D. 1100-1700).

50X4

The site is located at the base of a small hill (mesa-like remnant of a river terrace) south of Kettle Lake. Two stone features (fox traps or meat caches), a bone scatter and soapstone fragments are present. The site has been surface collected and is an easy walk from Tanquary Camp.

Kettle Lake 50X7

Six localities situated on moraine deposits and river terraces around Kettle Lake, were documented in 1965. Twenty-three "ruins" in 6 groups were identified and mid-passage dwellings with central hearths plus a square building with stone walls (common kitchen?) were recorded. At least six tent rings appear to have been excavated. In 2000, 20 features were recorded including 15 house/ring features of various diameters. Radiocarbon dates place the site within the Independence 1 Culture (4000 – 3700 B.P.).

Kettle Lake Outlet 50X8

The site is on a large, flat, unvegetated terrace about 2 km from Tanquary and north of Kettle Lake, just north of a high ridge with a visible marker cairn on it. The primary site feature is a

large divided stone house with several internal components. A considerable amount of bone is present on the surface. The site may be related to the Independence 1 Culture, 4000 - 3700 B.P.

Very River
Midnight Site 50X25
The site is located on a flat, barren gravel terrace 1.25 m above Very River (summer level) on its south bank, east of an unnamed river. The site is considered significant and is vulnerable to human impacts due to its proximity to a hiking trail. The site consists of one tent ring with a flagstone floor & 11 flint knapping localities. The form of the lithic artifacts indicates a possible late Dorset period of occupation somewhere between A.D. 700 – 1100.

Daylight Site 50X26
The site is on a gravel terrace 5.5 m above the Very River on its north shore (first terrace above water). A dwelling with a hearth, and a tent ring have been completely excavated and two other features (possible tent rings) were also tested. One other tent ring, an unknown feature and two caches are also present. The site probably relates to the Independence I Culture (4000-3700 B.P.).

Lake Hazen
Rivendell Site 50X40
The site is on the north shore of Lake Hazen at the west end of the lake between Adams and Turnstone Rivers. It is on a gravel terrace on the hiking trail between Lake Hazen and Tanquary Fiord and is accessible by helicopter, foot, and boat (Hazen Camp). Three dwelling structures, six caches and several lithic, bone and ivory artifacts have been identified. Radiocarbon dating indicates a Transitional Independence I/II cultural affiliation from 3190-2710 B.P.

Ruggles Outlet Site 50X73
The site is on the west bank of the Ruggles River at its outlet to Lake Hazen. It is one of the richest precontact sites in the park in terms of artifact collections. It is an extensive Thule camp, likely dating to A.D. 100-1700 with many diagnostic bone, antler, ivory, lithic and wood artifacts. Two winter houses, one tent ring, two slab caches, and a fox trap are present.

Other Sites
50X165
The site is on the south bank of the Adams River near a hiking trail on a low boulder strewn knoll opposite where the river straightens and flows against a steep cliff on the north side. A boulder covered beach lies to the north and a gravel bar to the west. Two dwellings and five caches comprise the site and bone fragments are scattered. The site is assigned a Thule cultural affiliation from A.D. 1100–1700 based on the form of the features.

Zone 1 Areas

The following are Zone 1 areas that require special mitigation.

Lake Hazen Basin
This area has a high diversity and abundance of vegetation, wildlife, and archaeological sites. It is one of four oases in the High Arctic. No camping permitted within 1 kilometre of west end of

Lake Hazen. No sport fishing. New regulations are expected for Human Use in the Lake Hazen Basin.

Fort Conger
All persons – including Inuit – traveling by motorized means to or from this area must be accompanied by a Parks Canada staff member. Education about polar bear safety for all visitors to/users of the site is required.

Lewis Lake
This is a denning area for arctic wolves. No camping will be permitted within this zone, which extends to three kilometres on all sides of Lewis Lake.

Kettle Lake and Muskox Wall Archaeological Sites
This is representative of high arctic archaeology. Self-guided interpretive walk will be developed that will provide park visitors and users with guidelines on appropriate behaviours at the site, as well as interpretive details about the features in the area. No camping in this area.

Sirmilik

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Management of human waste

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- Pack it out or bury it under rocks away from trails, campsites and any fresh water source. At the very last resort feces can be deposited under rocks 50 meters from camp sites, travel routes and water bodies. Avoid disturbing plant communities.
- If near a body of *salt water* (i.e. one of the coastal areas of the park) it is acceptable to deposit your feces in a shallow pit below the high water mark.
- Minimize the use of toilet paper. Burn it as completely as possible or pack it out. Tampons should be packed out, in a zip-lock bag, with other garbage.

Glaciers

- Pack out, concentrate urine in one area on the periphery of camp, cover stains with snow if possible
- To lessen the chance of contamination, especially in more popular areas, human feces should be buried as deep as possible in pit privies or deposited into crevasses

Snow
Guides shall ensure that groups move well off main trail or landing area 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.

Site Specific

Cape Hay Area
This area has seabird cliffs with high concentrations of nesting birds. The surrounding area also contains archaeological resources and many polar bears come ashore. During the ice-free season, guides should visit this area only by boat. No land-based activities, including camping will be permitted in the Cape Hay area.

South Bylot Island
The lowlands of South Bylot Island are important snow goose nesting areas. Guides must ensure that the birds are not disturbed from their nests. During their annual molt, large numbers of adult geese and their young are unable to fly and are particularly sensitive to stress from disturbance by humans. Guides are to ensure that the birds are not pursued or approached.

Goose Camp Valley
The Goose Camp is a center of scientific research into the ecology of Sirmilik National Park. Many scientific projects and experiments are located in the vicinity of the camp. To avoid disturbance of scientific investigations, guides are to avoid the area during the summer field season.

Tuktut Nogait

Management of human waste

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- Encourage clients to use washrooms before boarding the aircraft.
- Urine in healthy people is sterile. Urinate 50 meters away from the aircraft landing site, travel routes, camping areas and water bodies.
- Human waste is best disposed of by leaving it exposed on the ground, preferably on a south-facing slope and at least 50 m. above the high water mark of any water body. Smearing the faeces will accelerate decomposition.
- Toilet paper should be burned (if safe to do so) or packed out.

Glaciers

- Pack out, concentrate urine in one area on the periphery of camp, cover stains with snow if possible
- To lessen the chance of contamination, especially in more popular areas, human feces should be buried as deep as possible in pit privies or deposited into crevasses

Snow
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- Guides should leave in place and report locations of found artifacts.
- Guides are encouraged to include cultural interpretation of Park resources and are advised to work with PC to locate cultural sites which are less sensitive to disturbance for this purpose. PC will provide background information and assist with developing interpretive materials.

300X189 (Burials)
The site on the west side of the Hornaday River, atop the highest bluff in the area, just east of a small lake, and south of a creek. The creek runs eastward down the bluff and into the Hornaday River. A long lake, generally oriented north-south, lies about 1.6km to the west-southwest, and a very large, unnamed lake lies about 3.7km to the south-southwest. The site consists of two graves, covered by slabs and boulders, with chambers about 1m square. Pieces of wood are scattered around the perimeter of each grave, which are 10m apart, centre-to-centre. The graves could relate to either Copper Inuit or Mackenzie Inuit, dating as far back as A.D. 1725.

300X246 (Possible Burial)
This site is on the west bank of the Hornaday River, on east-sloping land about 0.5km south of La Ronciere Falls. A bare knoll is located about 150m north of the site. It is speculated to be a grave, based on the similarity of features (made of wood) in Ivvavik (Adams 1999).

300X284 (Burial)
The site is high atop the edge of a rocky outcrop, above the western bank of the Hornaday River. It is just east of a small tundra lake and about 100m north of a creek, and lies between the large site 300X183 and the graves at 300X189.

300X321 (Possible Burial)
The site is located on a high point of land on the west side of the Hornaday River 1.5km away, and backing on a small low spot containing a lake and three small ponds feeding the Hornaday River by a stream. The presence of possible grave goods and bone, as well as the unusual form of the feature suggests it is a possible grave. It rests about 6m from the northwest corner of the landform in a rock strewn gravel topped ridge with boulders and some exposed bedrock and light vegetation cover.

Ukkusiksalik

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Management of human waste

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- Urine in healthy people is sterile. Urinate 50 meters away from the aircraft landing site, travel routes, camping areas and water bodies.
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- If near a body of *salt water* (i.e. one of the coastal areas of the park) it is acceptable to deposit your feces in a shallow pit below the high water mark.
- Minimize the use of toilet paper. Burn it as completely as possible or pack it out. Tampons should be packed out, in a zip-lock bag, with other garbage.

Glaciers

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Site Specific

Coastal areas

Many archaeological sites exist along the entire shoreline of the park. Guides must accompany visitors, educate them about regulations and appropriate behaviour at archaeological sites, and ensure that no artifacts are handled, moved, damaged or removed.

Hudson Bay Company Site

Guides must accompany visitors to this location, educate them about regulations and appropriate behaviour at archaeological sites, and ensure that no artifacts are handled, moved, damaged or removed.

Peregrine Falcon Nesting Sites

Common on steep cliff faces of islands. Avoid nesting sites and report sightings to Park staff.